PROBLEM SOLVING SOLVED



MATHS TOOLBOX

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Problem Solving Solved
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1 Ratio

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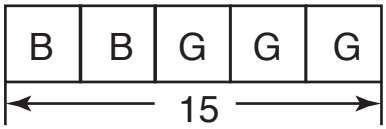
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1.1 Ratio introduction 1

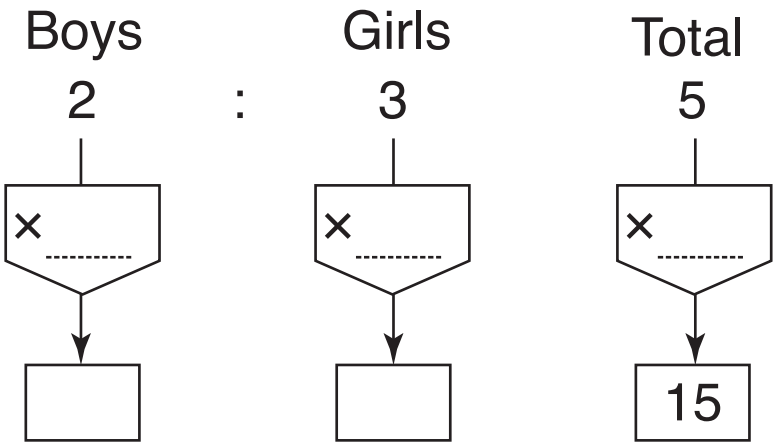
F/H

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1 The ratio of boys to girls at a chess club is 2:3
The total number of boys and girls at the chess club is 15

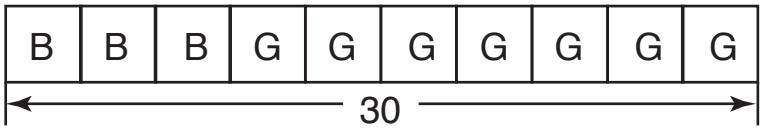


Here is a diagram.

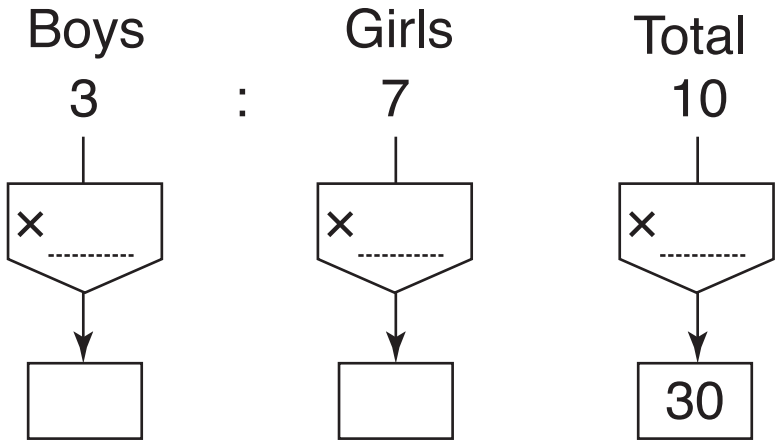


Complete the diagram.

2 The ratio of boys to girls at a computer programming club is 3:7
The total number of boys and girls at the computer programming club is 30



Here is a diagram.



Complete the diagram.

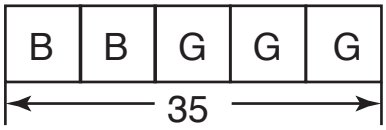
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1.1 Ratio introduction 2

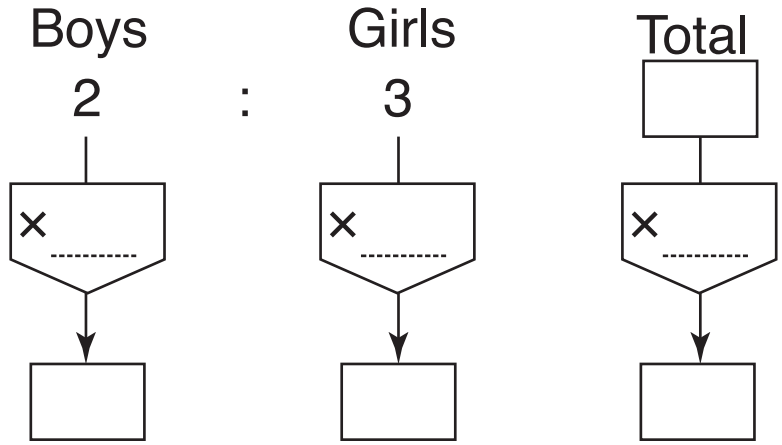
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1 The ratio of boys to girls at a volleyball club is 2:3
The total number of boys and girls at the volleyball club is 35

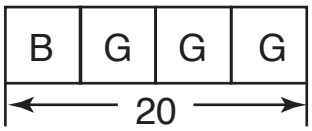


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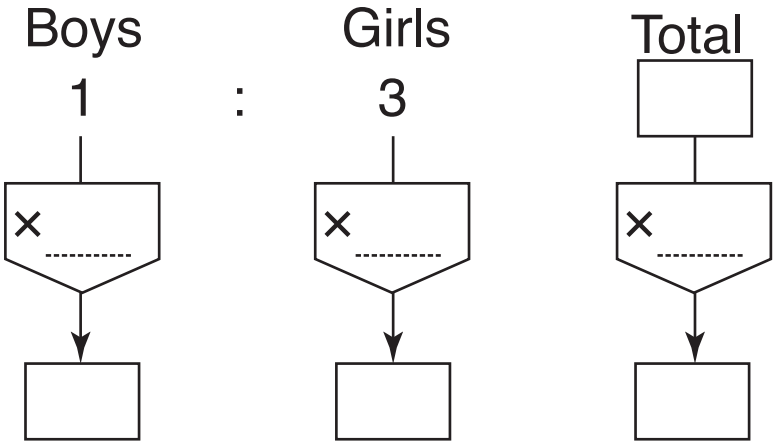


Complete the diagram.

2 The ratio of boys to girls at a tennis club is 1:3
The total number of boys and girls at the tennis club is 20



Here is a diagram.



Complete the diagram.

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1.1 Ratio introduction: Test

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1 The ratio of boys to girls at a football club is 2:3
The total number of boys and girls at the football club is 30.

1a Work out how many boys are at the football club.

Answer _____

1b Work out how many girls are at the football club.

Answer _____

2 The ratio of boys to girls at a volleyball club is 3:4
The total number of boys and girls at the volleyball club is 35.

2a Work out how many boys are at the volleyball club.

Answer _____

2b Work out how many girls are at the volleyball club.

Answer _____

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1.1 Ratio introduction Answers

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1.1 Ratio introduction 1

1

Boys	:	Girls	Total
2		3	5
× 3		× 3	× 3
6		9	15

2

Boys	:	Girls	Total
3		7	10
× 3		× 3	× 3
9		21	30

1.1 Ratio introduction 2

1

Boys	:	Girls	Total
2		3	5
× 7		× 7	× 7
14		21	35

2

Boys	:	Girls	Total
1		3	4
× 5		× 5	× 5
5		15	20

1.1 Ratio introduction: Test

1

Boys	:	Girls	Total
2		3	5
× 6		× 6	× 6
12		18	30

1a answer: 12 boys
1b answer: 18 girls

2

Boys	:	Girls	Total
3		4	7
× 5		× 5	× 5
15		20	35

1a answer: 15 boys
1b answer: 20 girls

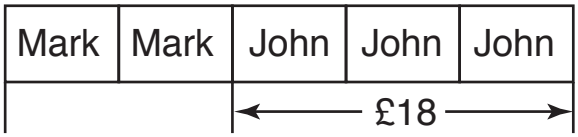
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1.2 Ratio next steps 1

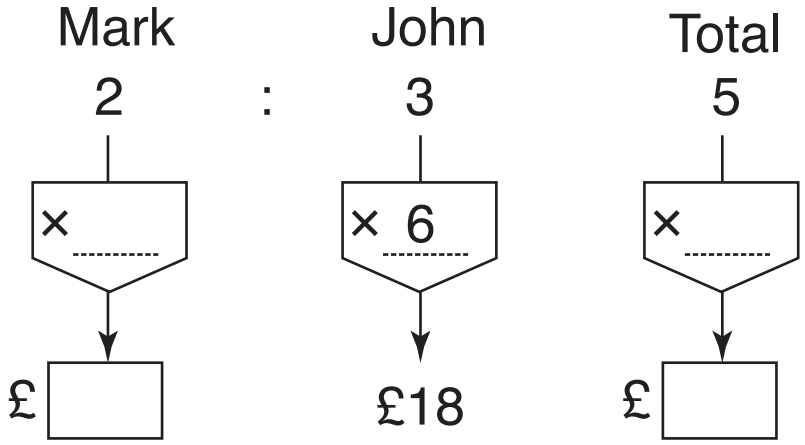
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1 Mark and John win some money.
They share the money in the ratio 2 : 3
John receives £18.

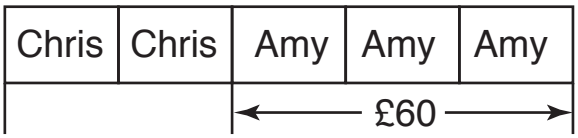


Here is a diagram.

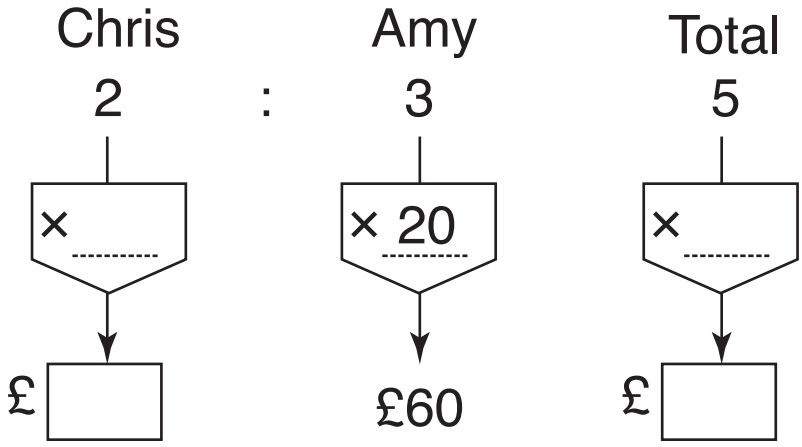


Complete the diagram.

2 Chris and Amy win some money.
They share the money in the ratio 2 : 3
Amy receives £60.



Here is a diagram.



Complete the diagram.

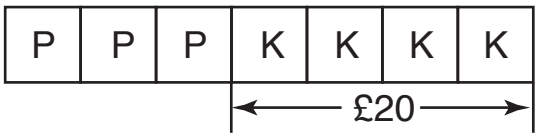
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1.2 Ratio next steps 2

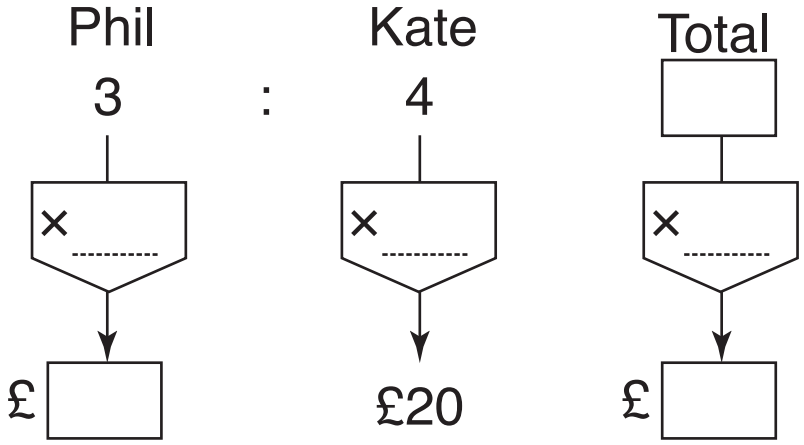
F/H

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1 Phil and Kate win some money.
They share the money in the ratio 3 : 4
Kate receives £20.



Here is a diagram.

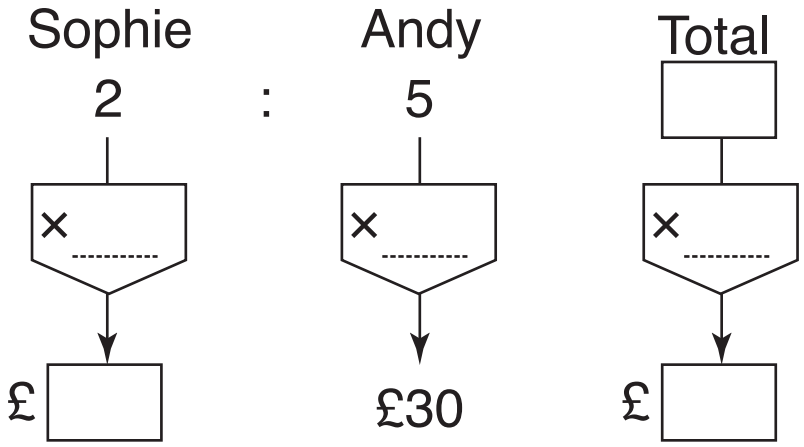


Complete the diagram.

2 Sophie and Andy win some money.
They share the money in the ratio 2 : 5
Andy receives £30.



Here is a diagram.



Complete the diagram.

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1.2 Ratio next steps: Test

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1 Dave and Ellie win some money.
They share the money in the ratio 2 : 3
Ellie receives £120.

1a Work out how much Dave receives.

Answer _____

1b Work out the total amount that Dave and Ellie win.

Answer _____

2 Paul and Kate win some money.
They share the money in the ratio 3 : 4
Kate receives £80.

2a Work out how much Paul receives.

Answer _____

2b Work out the total amount that Paul and Kate win.

Answer _____

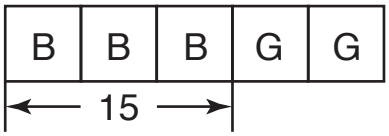
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1.3 Ratio Advanced 1

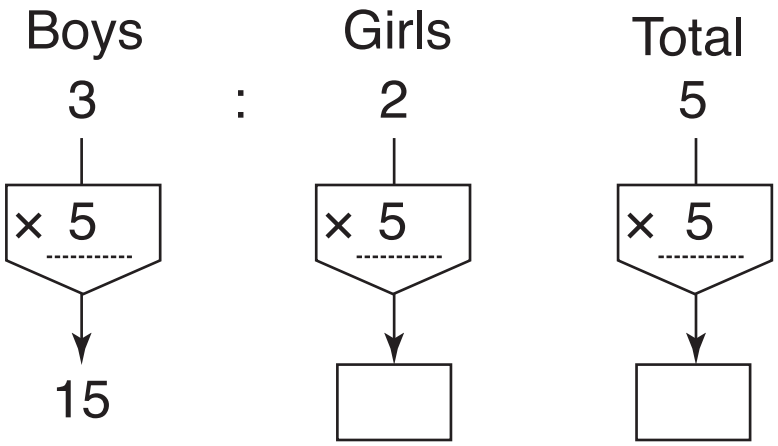
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1 The ratio of boys to girls at a basket ball club is 3:2
There are 15 boys at the basket ball club.

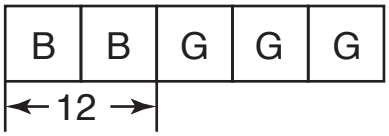


Here is a diagram.

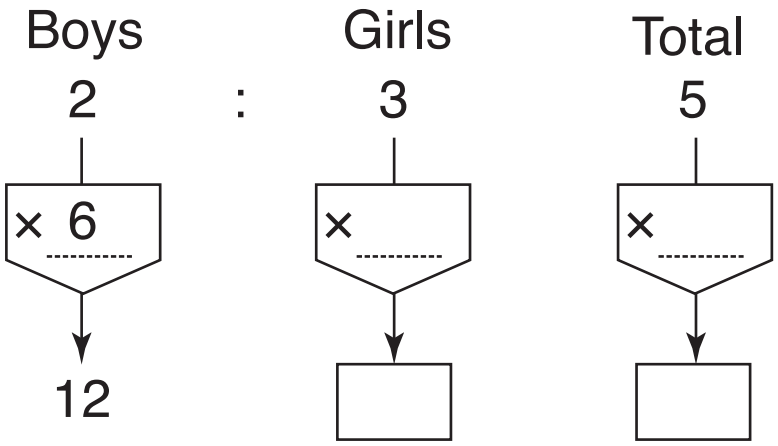


Complete the diagram.

2 The ratio of boys to girls at a swimming club is 2:3
There are 12 boys at the swimming club.



Here is a diagram.



Complete the diagram.

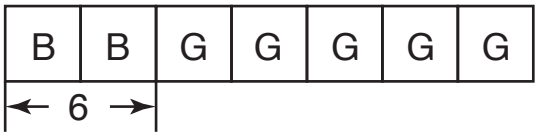
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1.3 Ratio Advanced 2

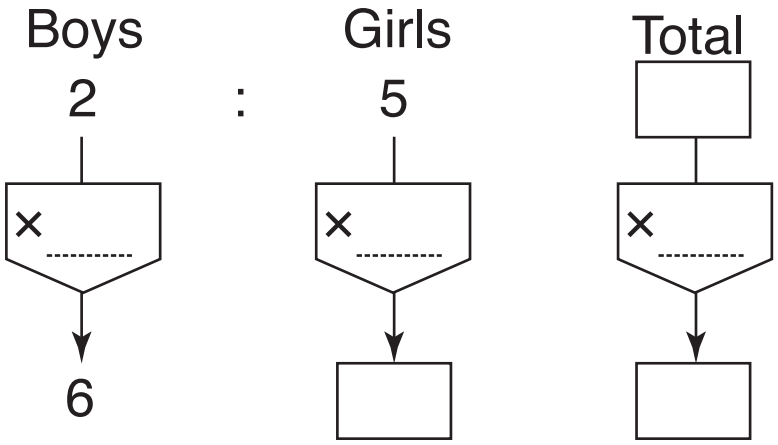
F/H

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1 The ratio of boys to girls at a tennis club is 2:5
There are 6 boys at the tennis club.



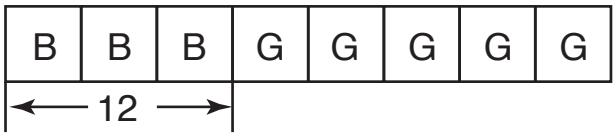
Here is a diagram.

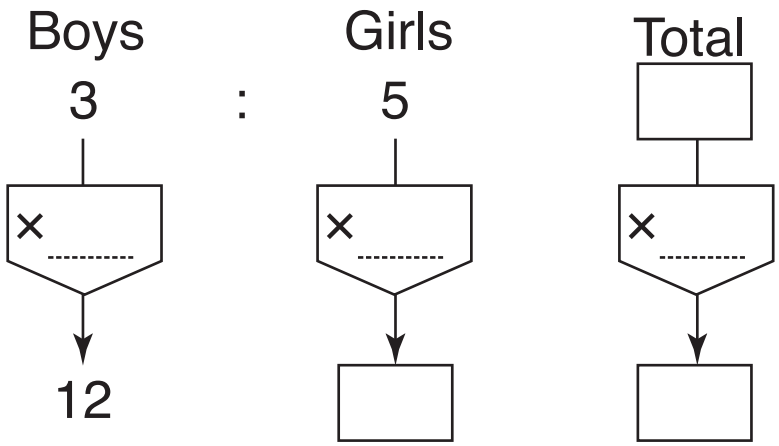


Complete the diagram.

2 The ratio of boys to girls at a running club is 3:5
There are 12 boys at the running club.

Here is a diagram.





Complete the diagram.

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1.3 Ratio Advanced : Test

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1 The ratio of boys to girls at a tennis club is 2:5
There are 8 boys at the tennis club.

1a Work out how much many girls are at the tennis club.

Answer _____

1b Work out the total number of boys and girls at the tennis club.

Answer _____

2 The ratio of boys to girls at a basketball club is 3:4
There are 9 boys at the basketball club.

2a Work out how many girls are at the basketball club.

Answer _____

2b Work out the total number of boys and girls at the basketball club.

Answer _____

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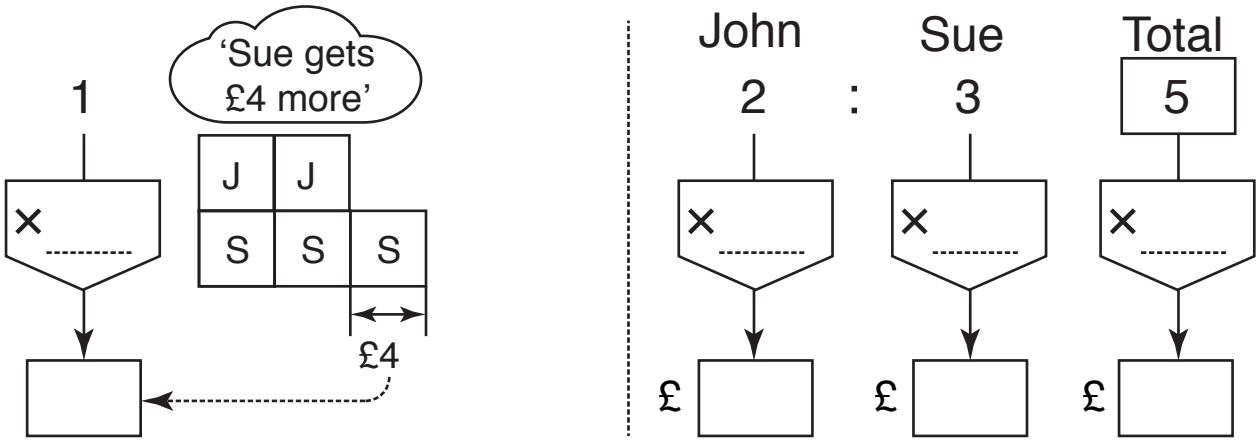
1.4 Ratio getting more introduction 1

F/H

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1 John and Sue share some money in ratio 2 : 3
Sue gets £4 more than John.

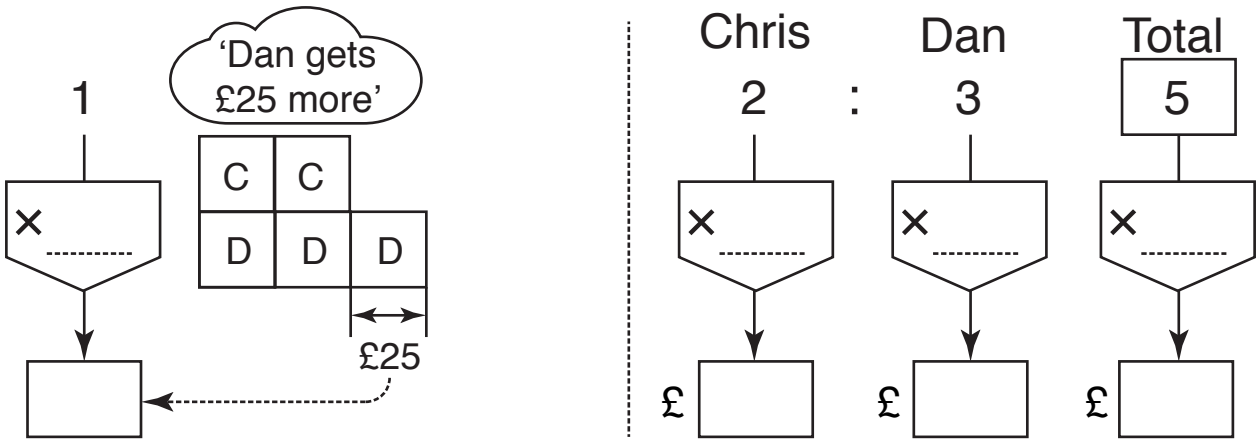
Here is a diagram.



Complete the diagram.

2 Chris and Dan share some money in ratio 2 : 3
Dan gets £25 more than Chris.

Here is a diagram.



Complete the diagram.

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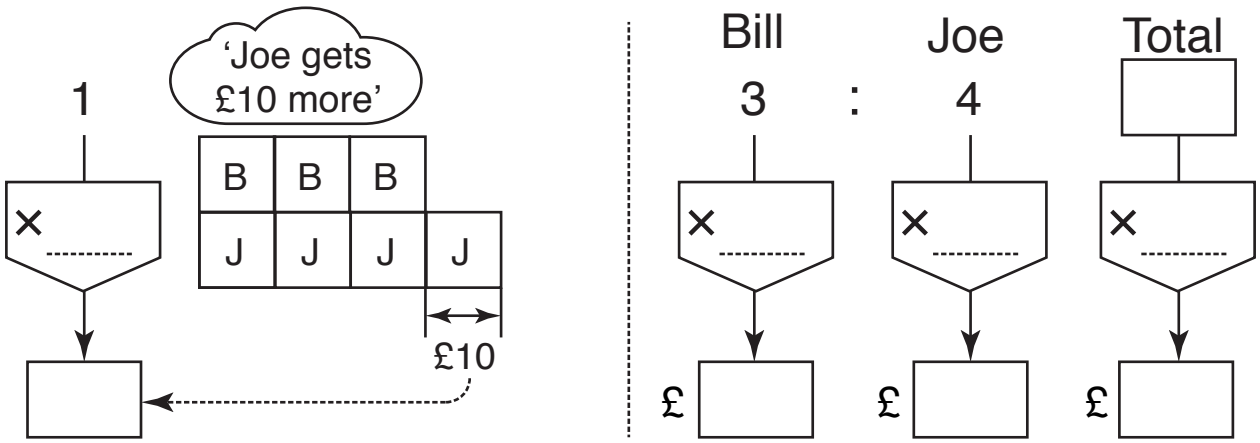
1.4 Ratio getting more introduction 2

F/H

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1 Bill and Joe share some money in ratio 3 : 4
Joe gets £10 more than Bill.

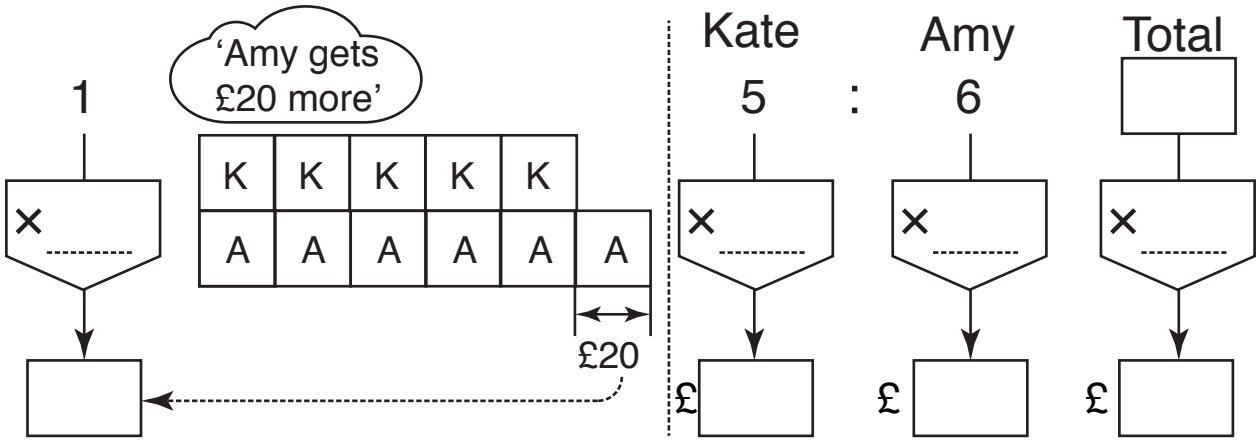
Here is a diagram.



Complete the diagram.

2 Kate and Amy share some money in ratio 5 : 6
Amy gets £20 more than Kate.

Here is a diagram.



Complete the diagram.

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1.4 Ratio getting more introduction: Test

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1 Tim and Andy share some money in ratio 2 : 3
Andy gets £5 more than Tim.

How much does each boy receive?

Answers Tim: _____ Andy: _____

2 Jody and Milly share some money in ratio 4 : 5
Milly gets £2 more than Jody.

How much does each girl receive?

Answers Jody: _____ Milly: _____

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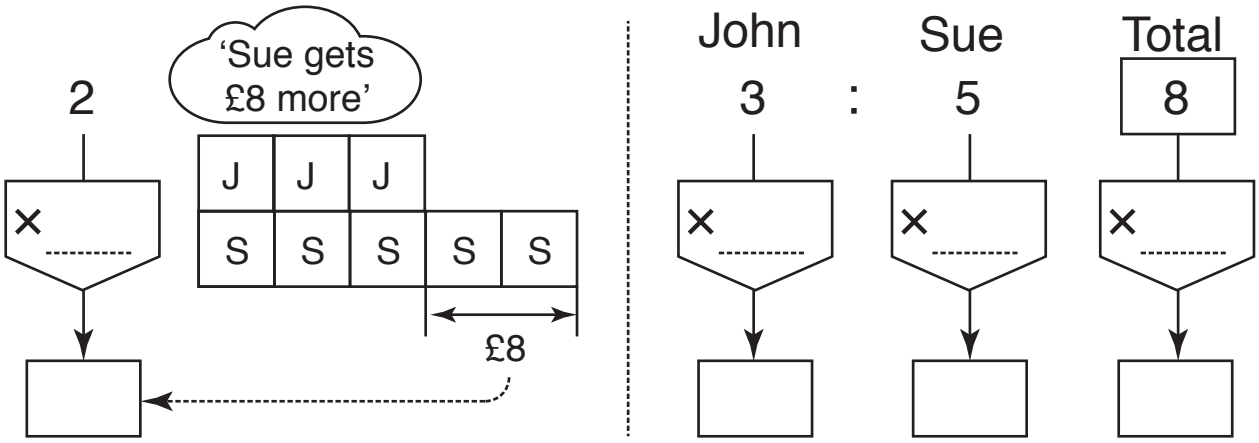
1.5 Ratio getting more advanced 1

F/H

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1 John and Sue share some money in ratio 3 : 5
Sue gets £8 more than John.

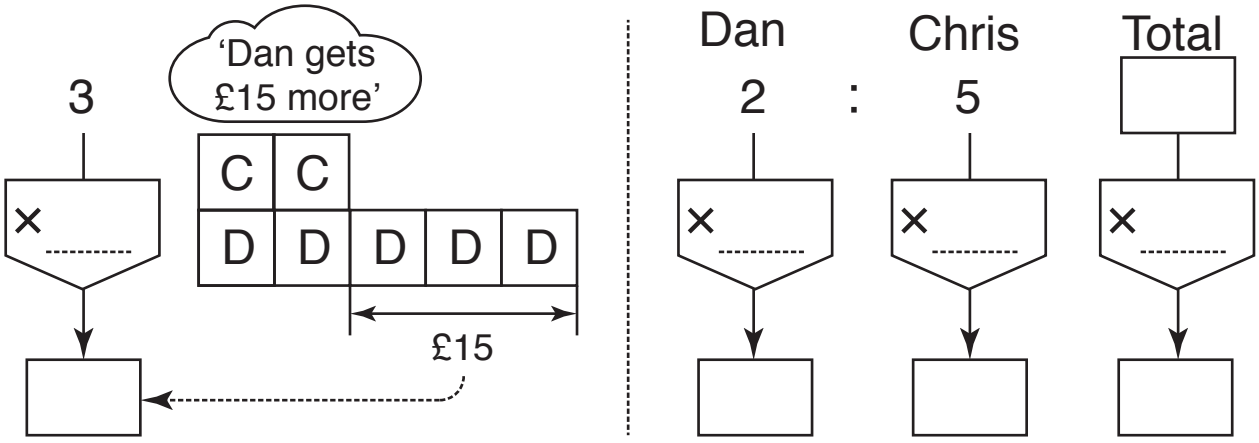
Here is a diagram.



Complete the diagram.

2 Chris and Dan share some money in ratio 2 : 5
Dan gets £15 more than Chris.

Here is a diagram.



Complete the diagram.

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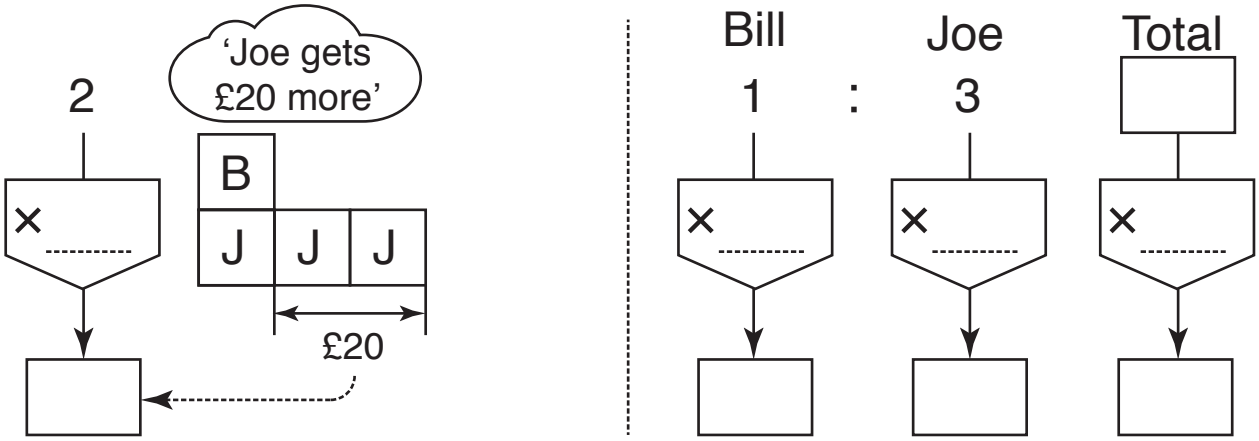
1.5 Ratio getting more advanced 2

F/H

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1 Bill and Joe share some money in ratio 1 : 3
Joe gets £20 more than Bill.

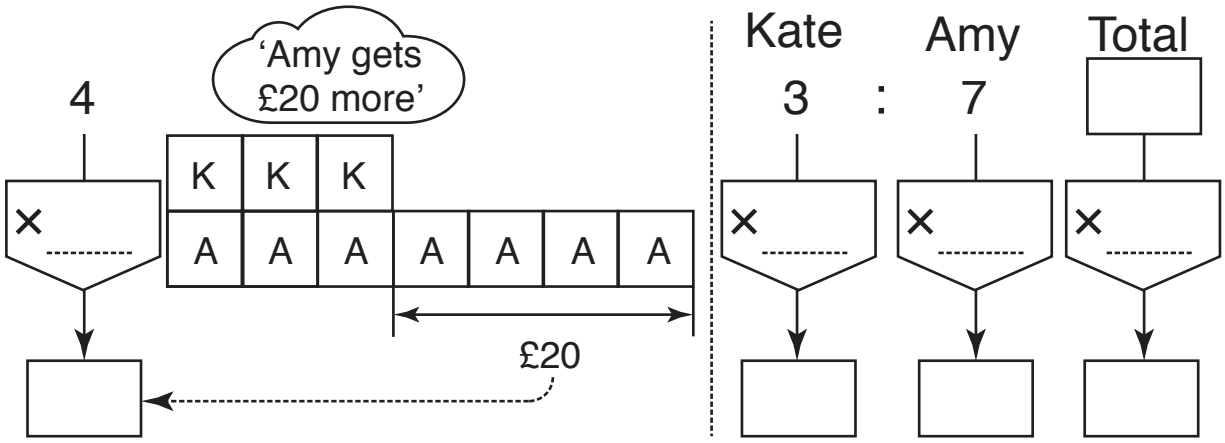
Here is a diagram.



Complete the diagram.

2 Kate and Amy share some money in ratio 3 : 7
Amy gets £20 more than Kate.

Here is a diagram.



Complete the diagram.

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1.5 Ratio getting more advanced: Test

F/H

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1 Tim and Andy share some money in ratio 2 : 5
Andy gets £21 more than Tim.

How much does each boy receive?

Answers Tim: _____ Andy: _____

2 Jody and Milly share some money in ratio 4 : 9
Milly gets £35 more than Jody.

How much does each girl receive?

Answers Jody: _____ Milly: _____

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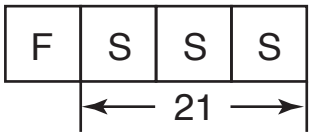
1.6 Ratio with further calculations introduction 1

F/H

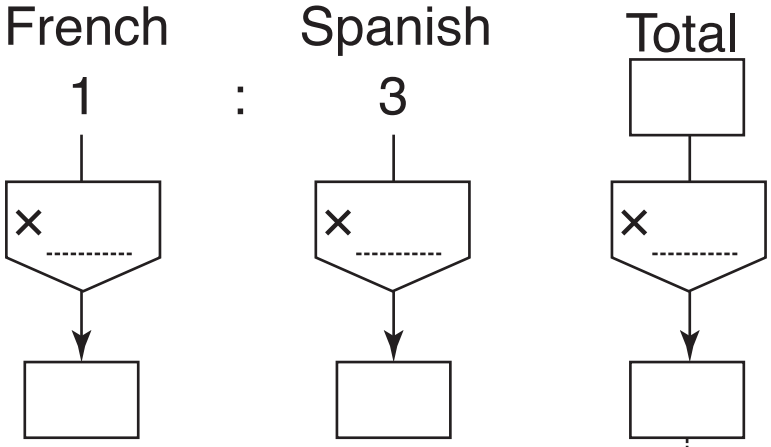
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1 A school sent students to a French and Spanish revision conference.

It sent both French and Spanish students.
The ratio of French to Spanish students it sent was 1 : 3
The school sent 21 Spanish students.

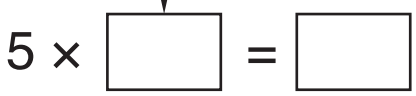


1a Complete the diagram.



1b **Four** other schools sent the **same total** number of students.

Calculate the total number of students at the conference.



Answer _____

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1.6 Ratio with further calculations introduction 2

F/H

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1 A school sent students to a History and Geography revision conference.

It sent both **History** and **Geography** students.
The ratio of History to Geography students it sent was **2 : 3**
The school sent **18 Geography** students.

1 a Calculate the total number of students that the school sent to the conference.

Answer _____

1 b Four other schools attended the conference.
Write down the total number of schools attending the conference.

Answer _____

1c Each school sent the **same** number of students.
Calculate the total number of students at the conference.

Answer _____

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1.6 Ratio with further calculations introduction: Test

F/H

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1 A school sent students to a Business Studies and Computing revision conference.

It sent both Business Studies and Computing students.
The ratio of Business Studies to Computing students it sent was 3 : 5
The school sent 20 Computing students.

Four other schools attended the revision conference.
Each school sent the same number of students.

Calculate the total number of students at the conference.

Answer _____

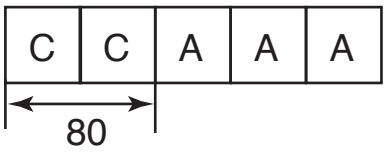
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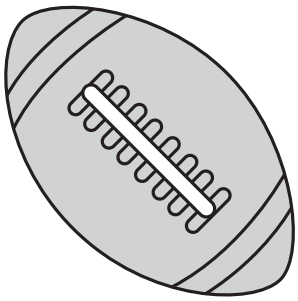
1.7 Ratio with further calculations advanced 1

F/H

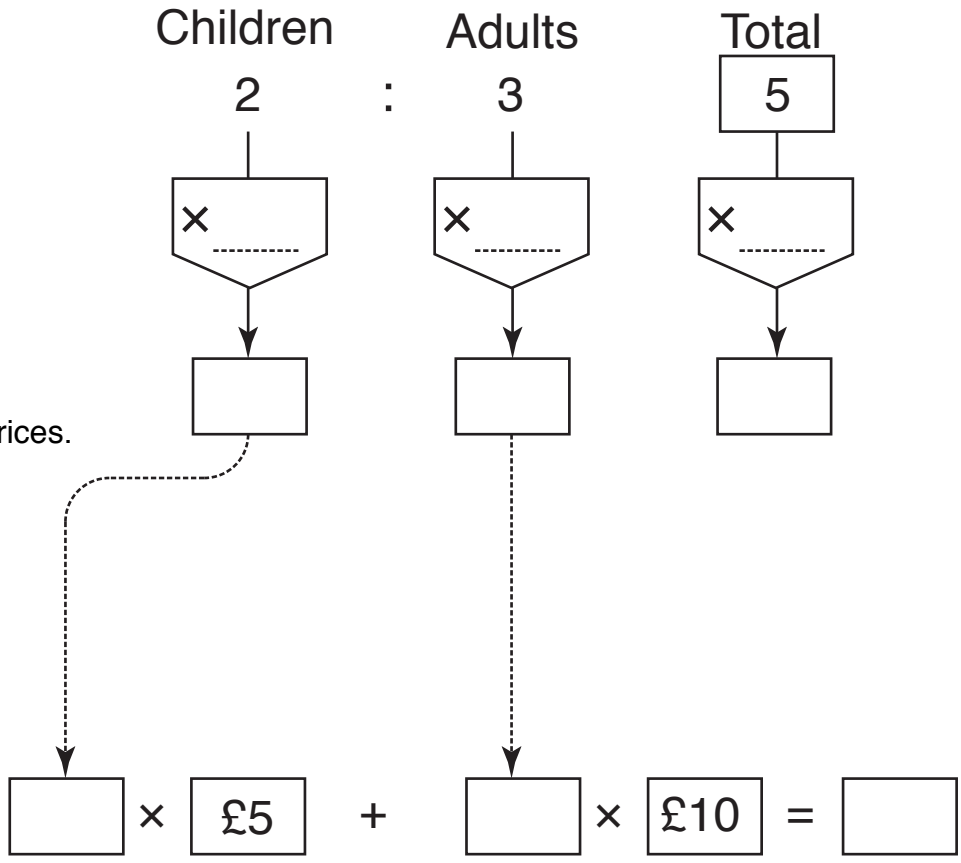
Licensed to The King's School, Devon

1 The ratio of children to adults at a rugby match is 2:3
There are 80 children at the match.





1a Complete the diagram.



1b Here are the ticket prices.

Children	*£5*
Adults	*£10*

Work out the total money made from ticket sales.

Answer _____

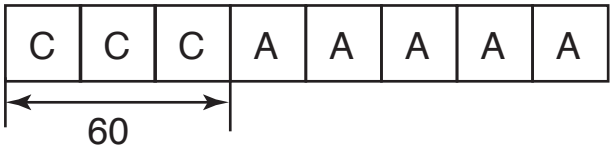
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1.7 Ratio with further calculations advanced 2

F/H

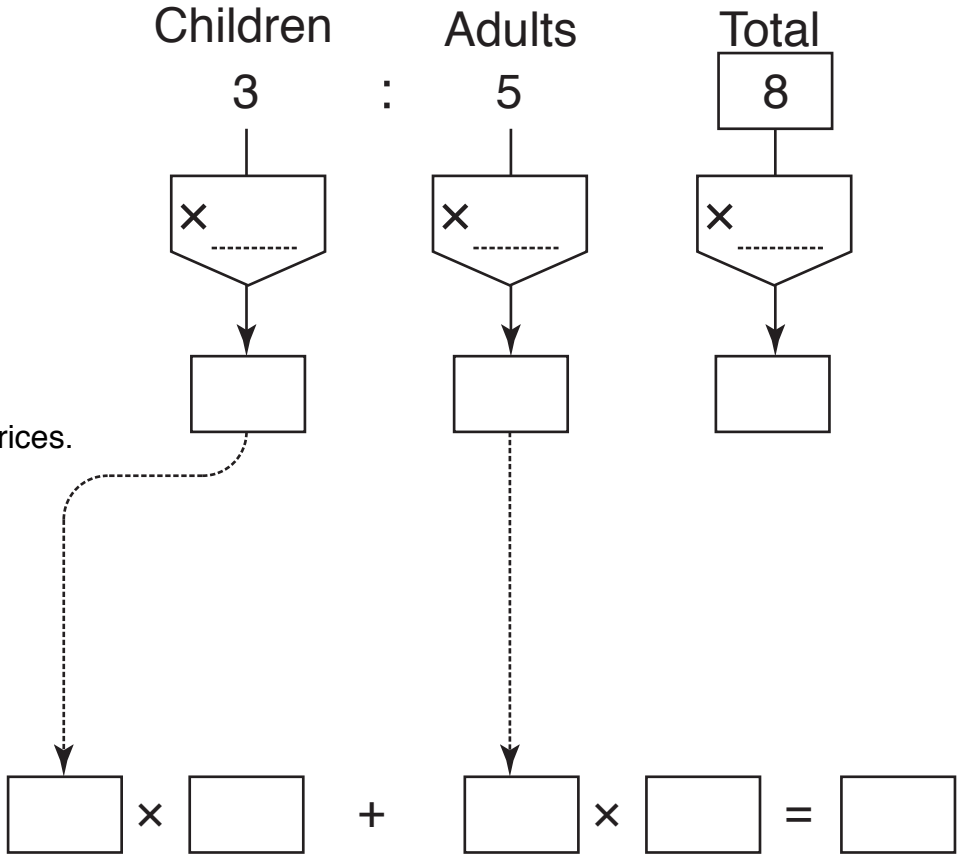
Licensed to The King's School, Devon

1 The ratio of children to adults at a football match is 3:5
There are 60 children at the match.





1a Complete the diagram.



1b Here are the ticket prices.

Children	*£4*
Adults	*£8*

Work out the total money made from ticket sales.

Answer _____

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1.7 Ratio with further calculations advanced: Test

F/H

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1 The ratio of children to adults at a tennis match is 2:3
There are 40 children at the match.



Child tickets cost £4.
Adult tickets cost £8.

Work out the total money made from ticket sales.

Answer _____

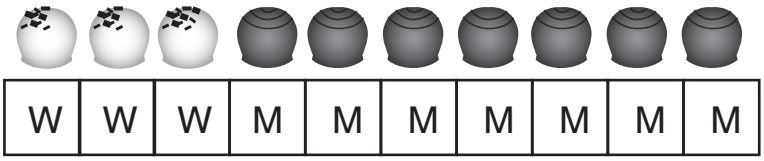
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1.8 Ratio and percentage introduction 1

F/H

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1 A box of chocolates has white and milk chocolates.
The ratio of white chocolates to milk chocolates is 3:7
Here is a diagram.



1a What fraction of the chocolates are white chocolates?

$$\frac{\square}{\square}$$

1b What percentage of the chocolates are white chocolates?

$$\frac{\square}{\square} \times \frac{10}{10} = \frac{\square}{100}$$

Answer _____ %

1c What fraction of the chocolates are milk chocolates?

$$\frac{\square}{\square}$$

1d What percentage of the chocolates are milk chocolates?

$$\frac{\square}{\square} \times \frac{10}{10} = \frac{\square}{100}$$

Answer _____ %

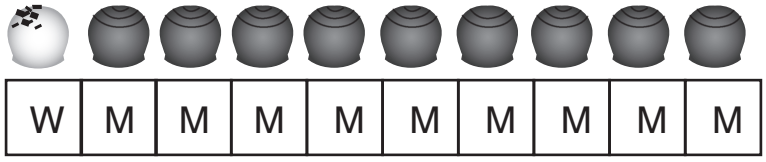
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1.8 Ratio and percentage introduction 2

F/H

Licensed to The King's School, Devon

1 A box of chocolates has white and milk chocolates.
The ratio of white chocolates to milk chocolates is 1: 9
Here is a diagram.



1a What fraction of the chocolates are white chocolates?

$\frac{\square}{\square}$

1b What percentage of the chocolates are white chocolates?

$\frac{\square}{\square} \times \frac{\square}{\square} = \frac{\square}{100}$

Answer _____ %

1c What fraction of the chocolates are milk chocolates?

$\frac{\square}{\square}$

1d What percentage of the chocolates are milk chocolates?

$\frac{\square}{\square} \times \frac{\square}{\square} = \frac{\square}{100}$

Answer _____ %

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1.8 Ratio and percentage introduction : Test

F/H

Licensed to The King's School, Devon

1 The ratio of girls to boys in a class is 7 : 3

1a What **fraction** of the class are **girls**?

Answer _____

1b What **percentage** of the class are **boys**?

Answer _____

2 The ratio of girls to boys in a class is 4 : 6

2a What **fraction** of the class are **girls**?

Answer _____

2b What **percentage** of the class are **boys**?

Answer _____

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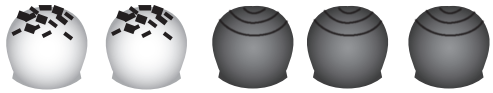
1.9 Ratio and percentage advanced 1

F/H

Licensed to The King's School, Devon

1 A box of chocolates has white and milk chocolates.
The ratio of white chocolates to milk chocolates is 2:3
Here is a diagram.

W	W	M	M	M



1a What fraction of the chocolates are white chocolates?

$$\frac{\square}{\square}$$

1b What percentage of the chocolates are white chocolates?

$$\frac{\square}{\square} \times \frac{20}{20} = \frac{\square}{100}$$

Answer _____ %

1c What fraction of the chocolates are milk chocolates?

$$\frac{\square}{\square}$$

1d What percentage of the chocolates are milk chocolates?

$$\frac{\square}{\square} \times \frac{20}{20} = \frac{\square}{100}$$

Answer _____ %

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1.9 Ratio and percentage advanced 2

F/H

Licensed to The King's School, Devon

1 A box of chocolates has white and milk chocolates.
The ratio of white chocolates to milk chocolates is 2:3
Here is a diagram.

W	M	M	M	M



1a What fraction of the chocolates are white chocolates?

$$\frac{\square}{\square}$$

1b What percentage of the chocolates are white chocolates?

$$\frac{\square}{\square} \times \frac{\square}{\square} = \frac{\square}{100}$$

Answer _____ %

1c What fraction of the chocolates are milk chocolates?

$$\frac{\square}{\square}$$

1d What percentage of the chocolates are milk chocolates?

$$\frac{\square}{\square} \times \frac{\square}{\square} = \frac{\square}{100}$$

Answer _____ %

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1.9 Ratio and percentage advanced: Test

F/H

Licensed to The King's School, Devon

1 The ratio of girls to boys in a class is 3 : 2

1a What **fraction** of the class are **girls**?

Answer _____

1b What **percentage** of the class are **boys**?

Answer _____

2 The ratio of girls to boys in a class is 4 : 1

2a What **fraction** of the class are **girls**?

Answer _____

2b What **percentage** of the class are **boys**?

Answer _____

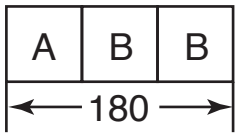
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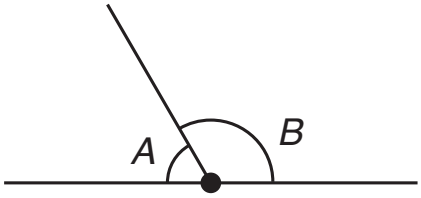
1.10 Ratio and angles introduction 1

F/H

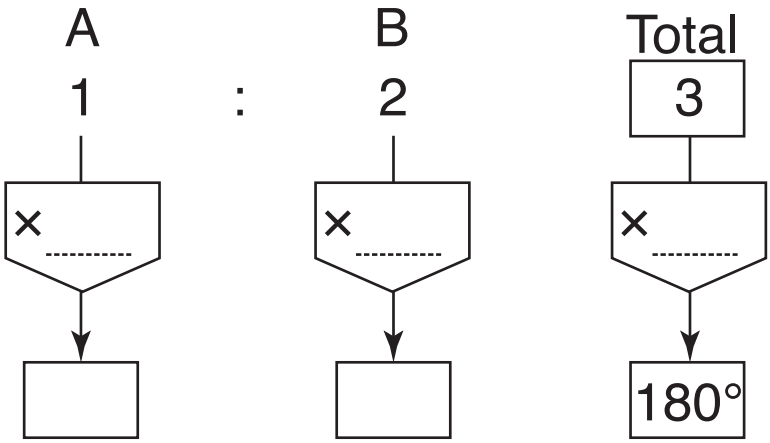
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1 The angles on a straight line are in the ratio 1: 2

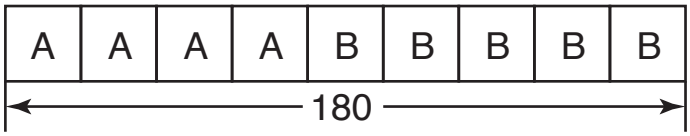


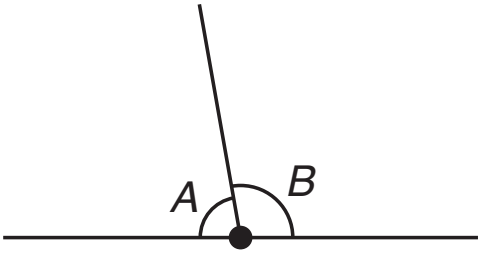


Complete the diagram.

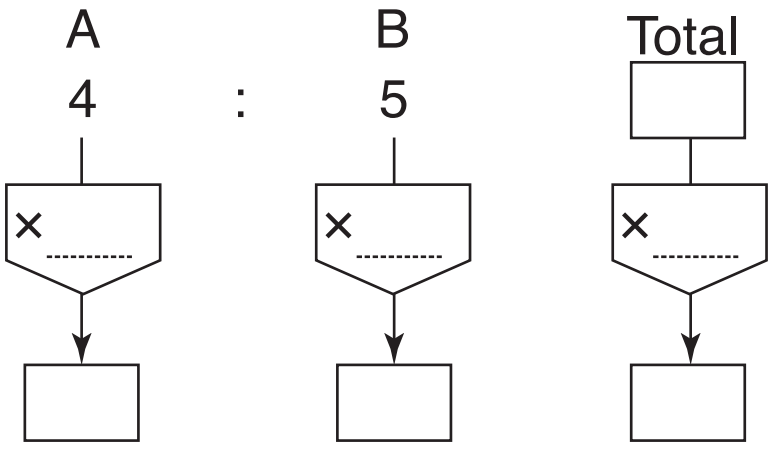


2 The angles on a straight line are in the ratio 4: 5





Complete the diagram.



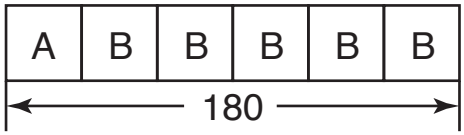
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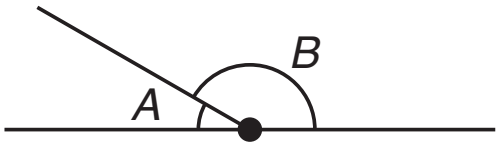
1.10 Ratio and angles introduction 2

F/H

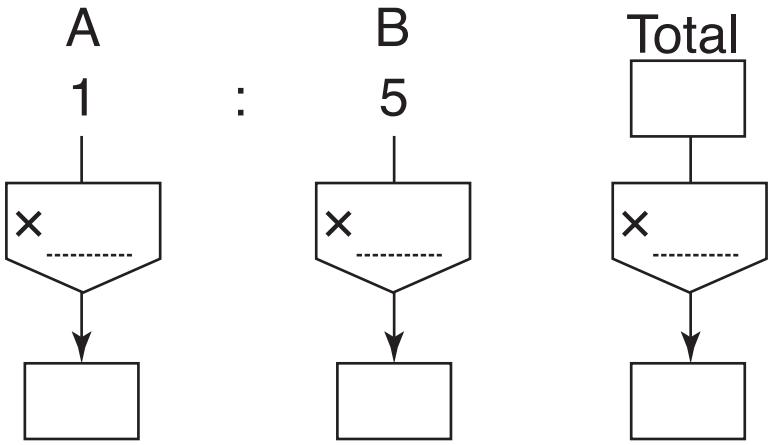
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1 The angles on a straight line are in the ratio 1: 5

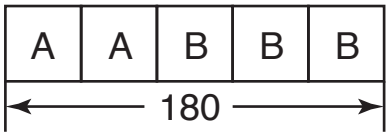


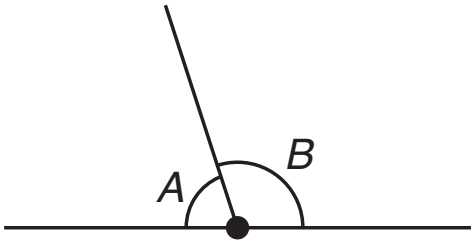


Complete the diagram.

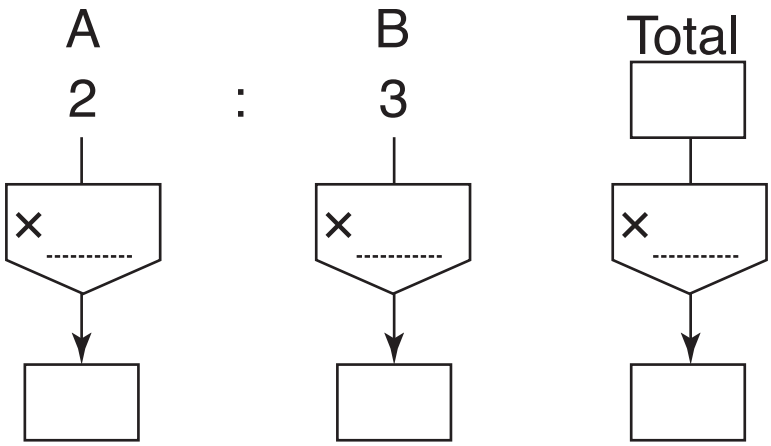


2 The angles on a straight line are in the ratio 2: 3





Complete the diagram.



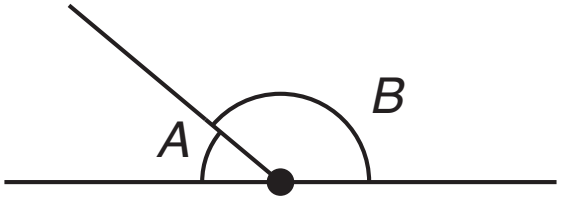
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1.10 Ratio and angles introduction: Test

F/H

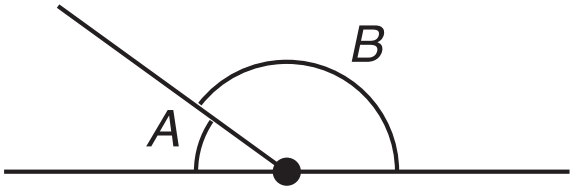
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1 The angles on a straight line are in the ratio 2: 7
Calculate the size of the largest angle.



Answer _____

2 The angles on a straight line are in the ratio 1: 4
Calculate the size of the largest angle.



Answer _____

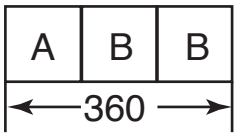
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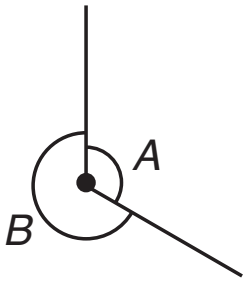
1.11 Ratio and angles next steps 1

F/H

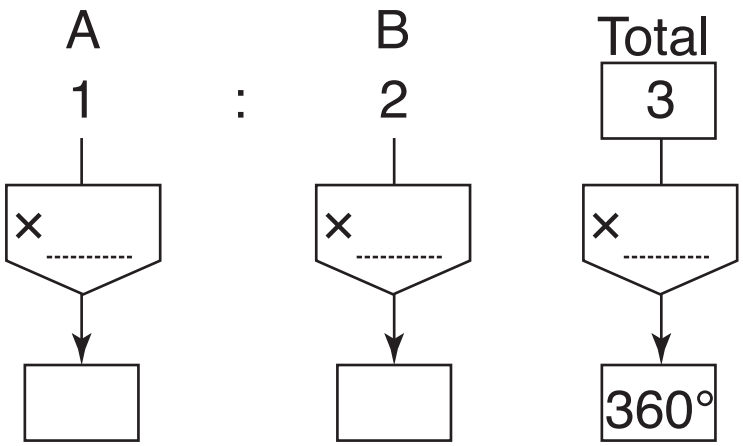
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1 Two angles around a point are in the ratio 1:2

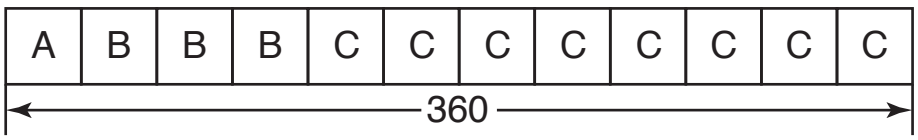


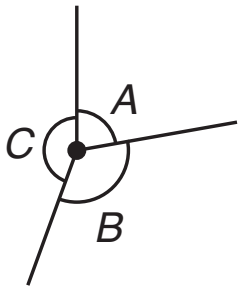


Complete the diagram.

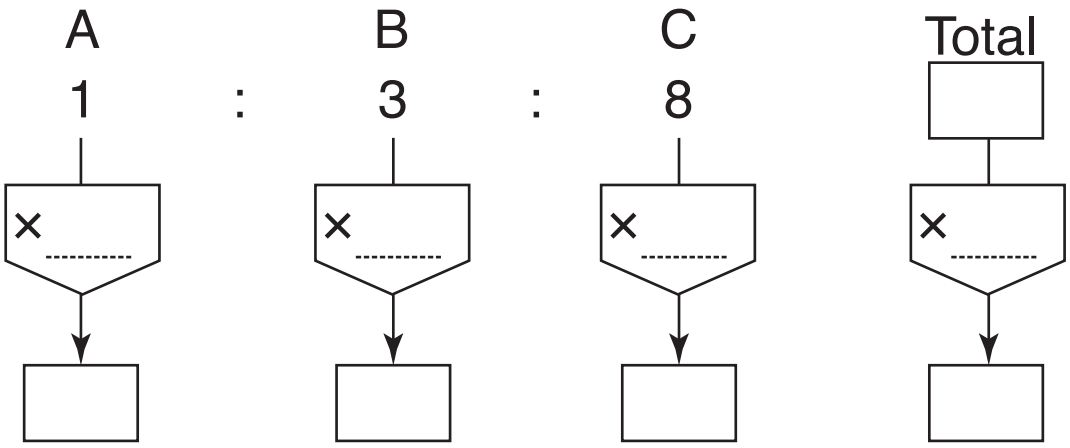


2 Three angles around a point are in the ratio 1 : 3 : 8





Complete the diagram.



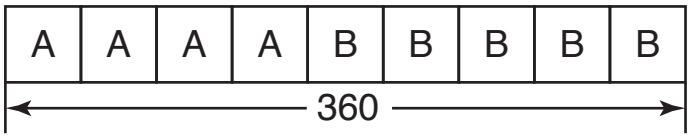
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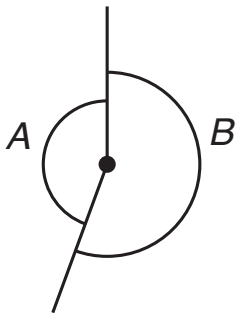
1.11 Ratio and angles next steps 2

F/H

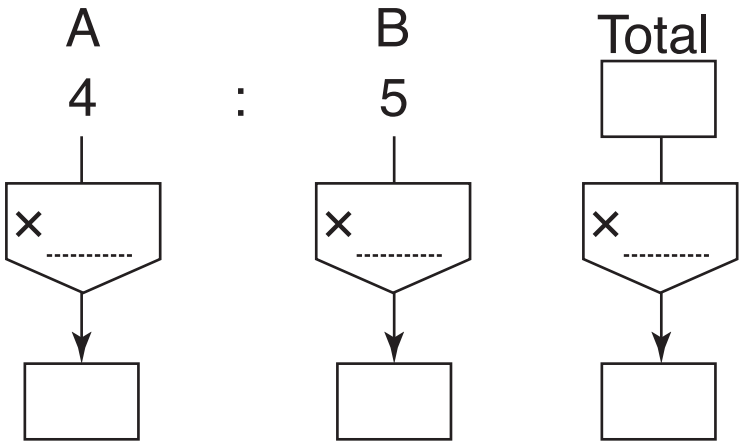
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1 Two angles around a point are in the ratio 4:5

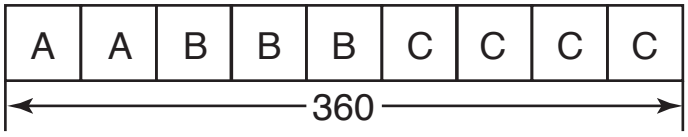


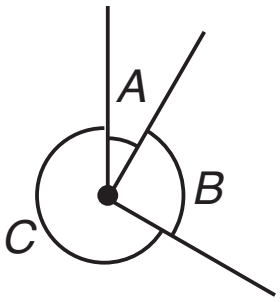


Complete the diagram.

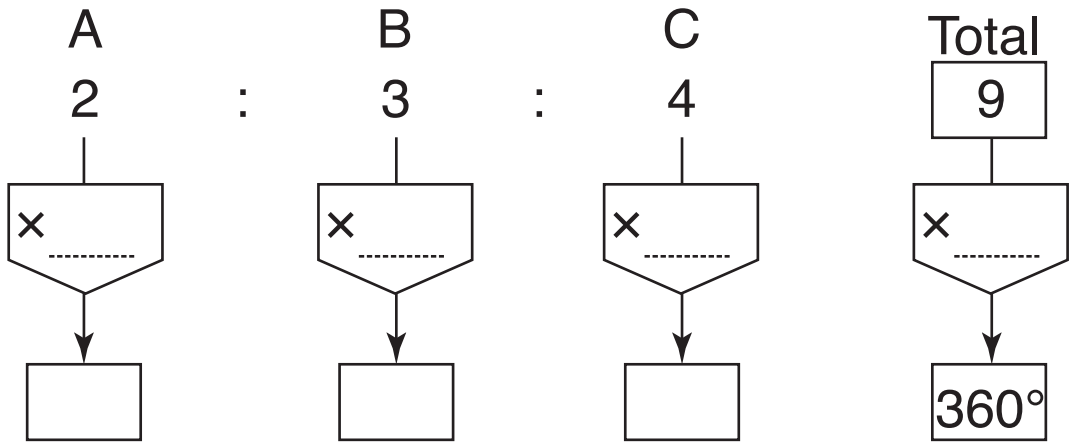


2 Three angles around a point are in the ratio 2 : 3 : 4





Complete the diagram.



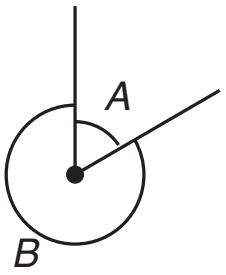
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1.11 Ratio and angles next steps: Test

F/H

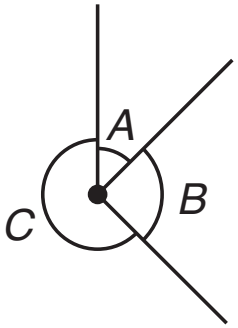
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1 The angles around a point are in the ratio 1 : 5
Work out the size of the largest angle.



Answer _____

2 The angles in a triangle are in the ratio 1 : 2 : 5
Work out the size of the largest angle.



Answer _____

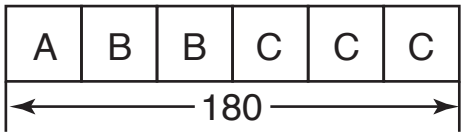
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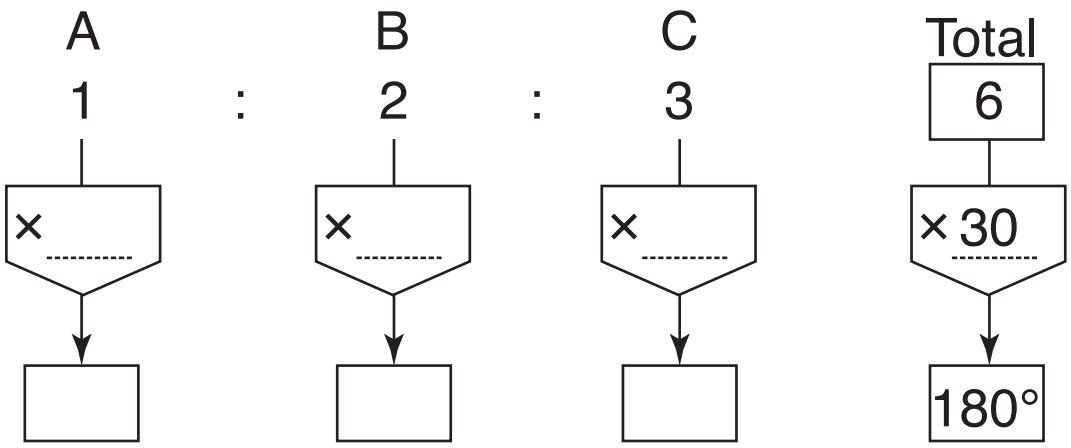
1.12 Ratio and angles advanced 1

F/H

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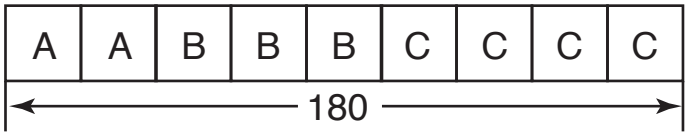
1 The angles in a triangle are in the ratio 1 : 2 : 3
Here is a diagram.

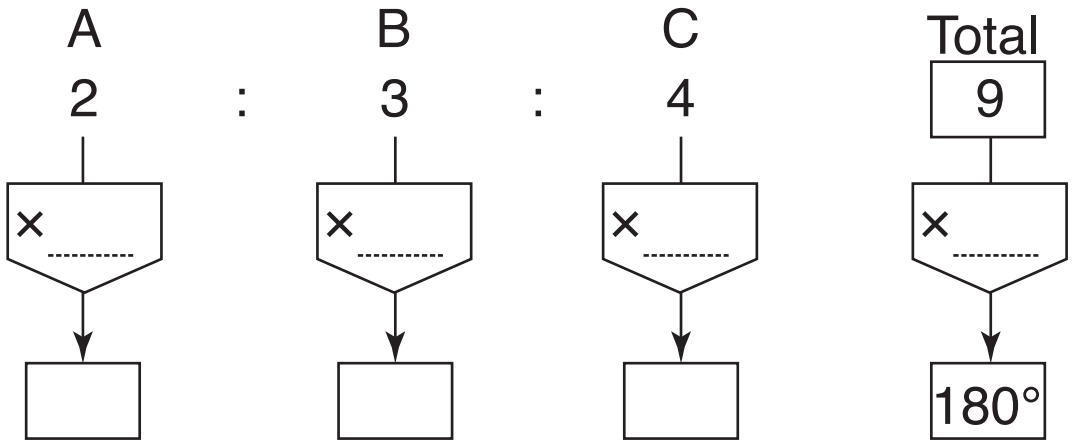




Complete the diagram.

2 The angles in a triangle are in the ratio 2 : 3 : 4
Here is a diagram.





Complete the diagram.

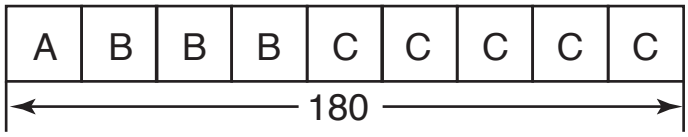
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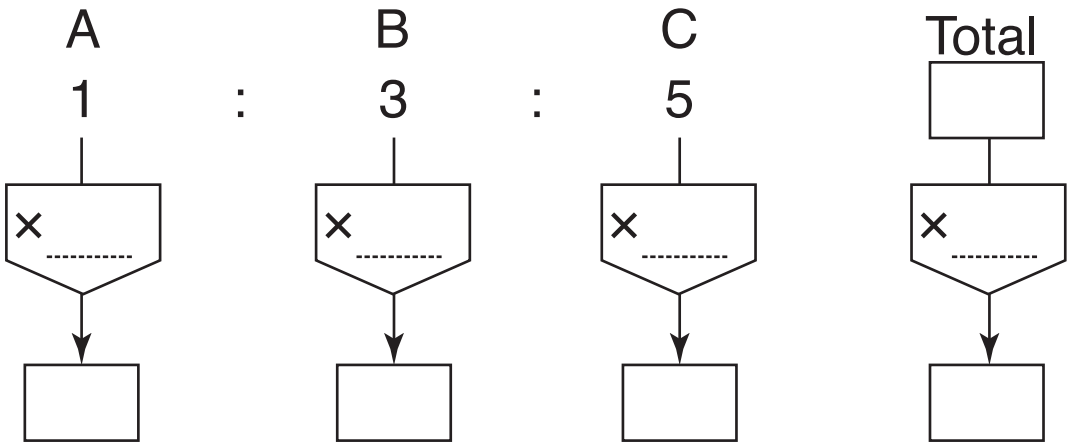
1.12 Ratio and angles advanced 2

F/H

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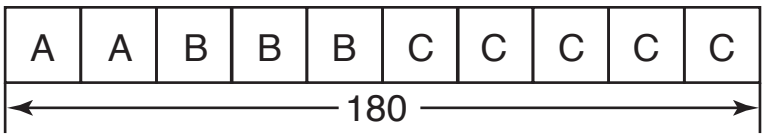
1 The angles in a triangle are in the ratio 1 : 3 : 5
Here is a diagram.

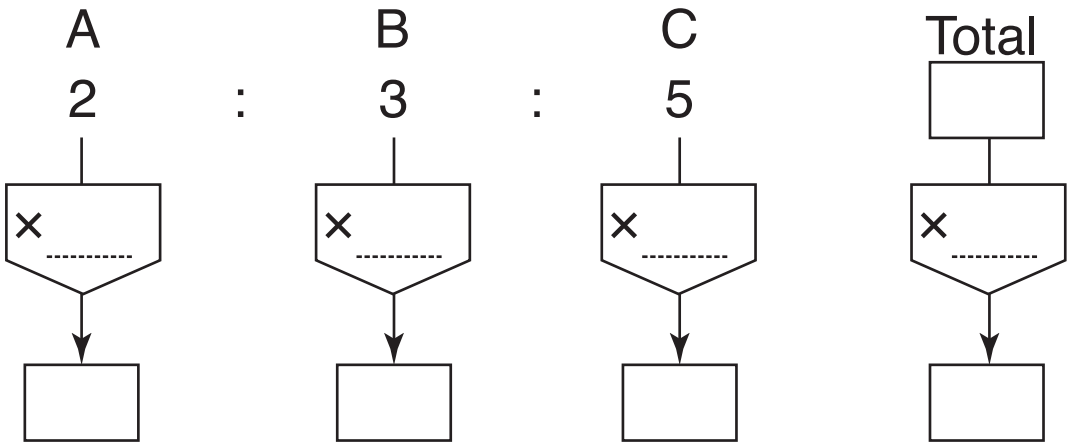




Complete the diagram.

2 The angles in a triangle are in the ratio 2 : 3 : 5
Here is a diagram.





Complete the diagram.

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1.12 Ratio and angles advanced: Test

F/H

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1 The angles in a triangle are in the ratio 1 : 5 : 6
Work out the size of the largest angle.

Answer _____

2 The angles in a triangle are in the ratio 2 : 3 : 7
Work out the size of the largest angle.

Answer _____

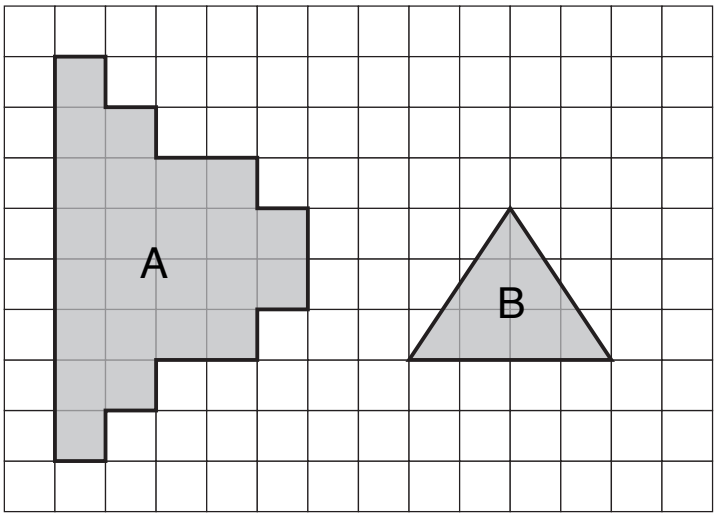
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1.13 Ratio and area simplifying ratios 1

F/H

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1 Here is shape A and shape B:



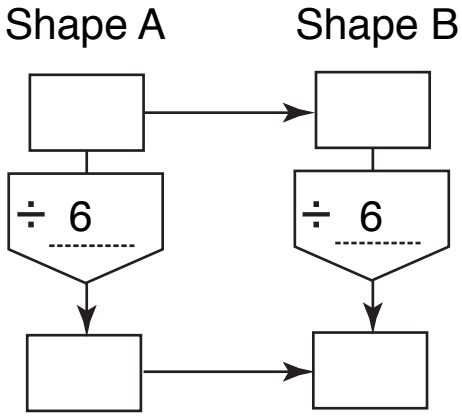
1a Work out area of shape A

Area = ☐ cm^2

1b Work out area of shape B

$$\text{Area} = \frac{\square \times \square}{2} = \square \text{ cm}^2$$

1c Work out the ratio of the area of shape A to area of shape B.



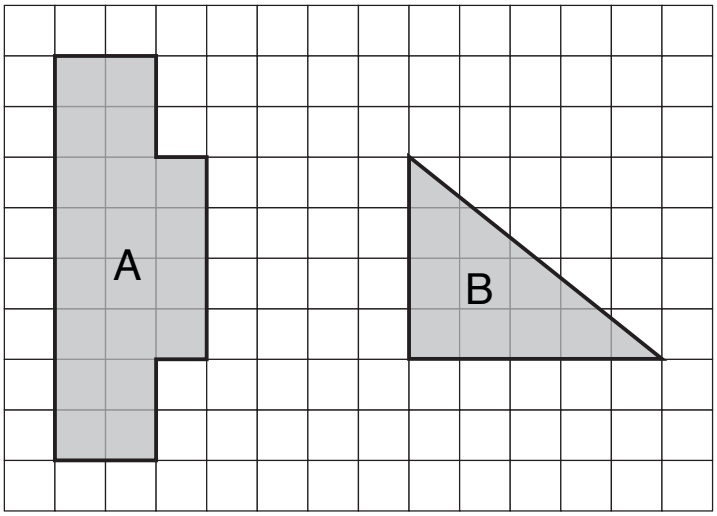
© Toticity Limited

1.13 Ratio and area simplifying ratios 2

F/H

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1 Here is shape A and shape B:



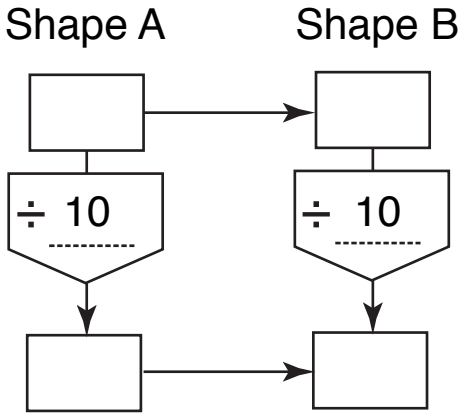
1a Work out area of shape A

Area = ☐ cm^2

1b Work out area of shape B

$$\text{Area} = \frac{\square \times \square}{2} = \square \text{ cm}^2$$

1c Work out the ratio of the area of shape A to area of shape B.



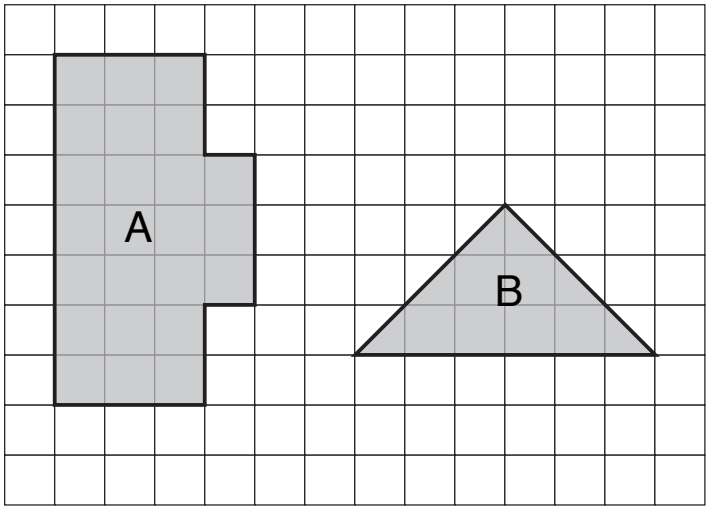
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1.13 Ratio and area simplifying ratios: Test

F/H

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1 Here is shape A and shape B:



Work out the ratio of the area of shape A to area of shape B
Give your answer in simplest form.

Answer _____

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1.14 Ratio and lcm 1

F/H

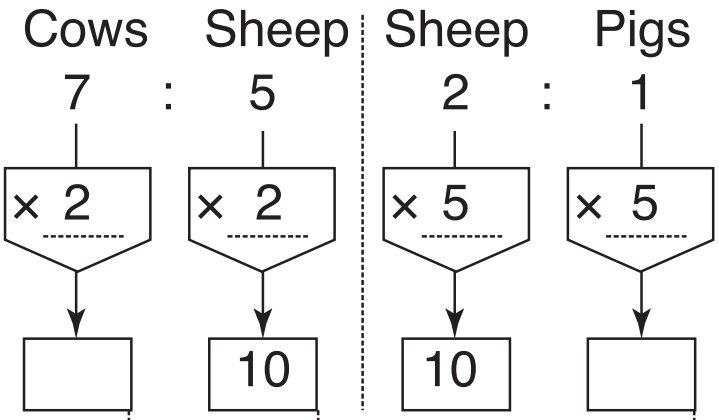
Licensed to The King's School, Devon

1a On a farm

the number of cows and the number of sheep are in the ratio 7:5

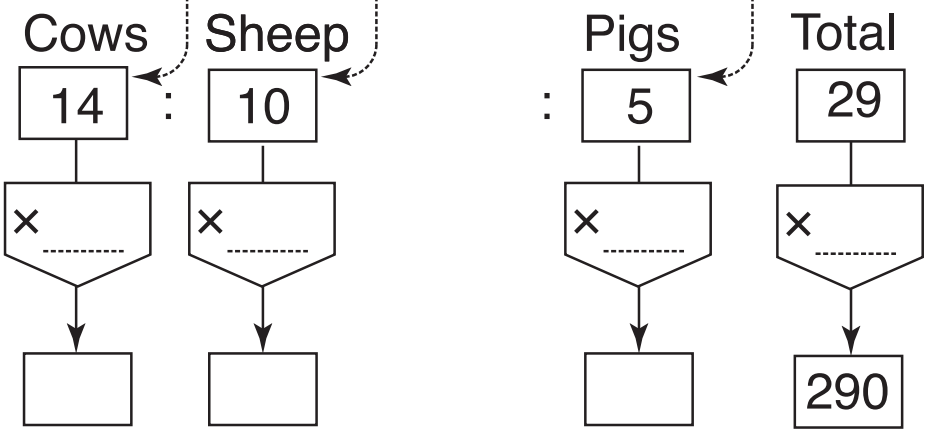
the number of sheep and the number of pigs are in the ratio 2:1

Multiply the ratios so that the number for sheep is the same in each.



1b The total number of cows, sheep and pigs on the farm is 290

Calculate how many of each animal there are.



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1.14 Ratio and lcm 2

F/H

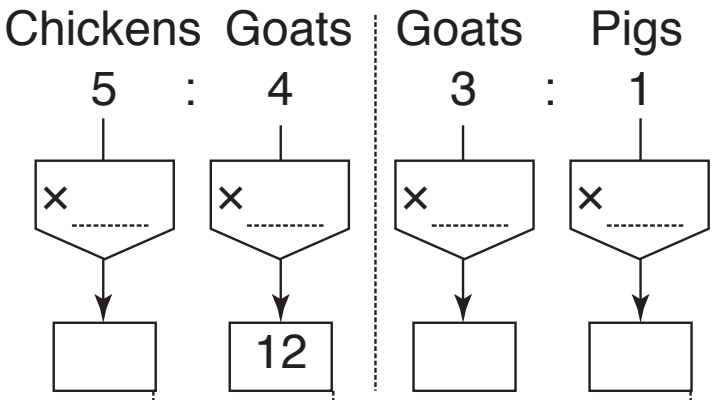
Licensed to The King's School, Devon

1a On a farm

the number of chickens and the number of goats are in the ratio 5:4

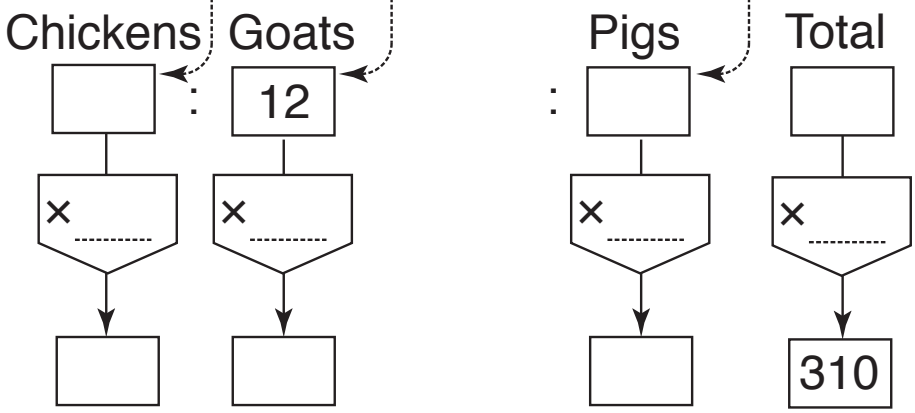
the number of goats and the number of pigs are in the ratio 3:1

Multiply the ratios so that the number for goats is the same in each.



1b The total number of chickens, goats and pigs on the farm is 310

Calculate how many of each animal there are.



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1.14 Ratio and lcm: Test

F/H

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1 On a farm

the number of cows and the number of sheep are in the ratio 7:5

the number of sheep and the number of pigs are in the ratio 3:1

The total number of cows, sheep and pigs on the farm is 410

How many sheep are there on the farm?

Answer _____

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2 Proportion

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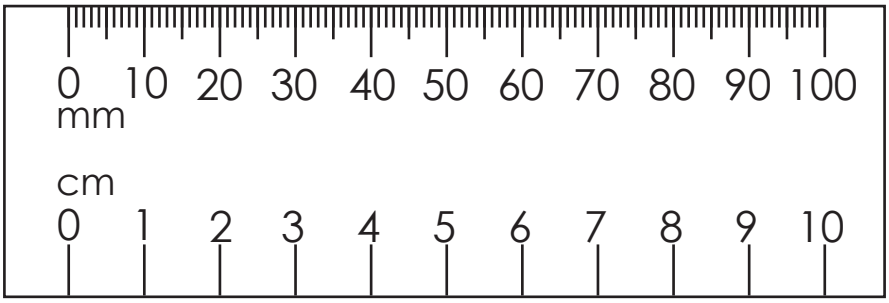
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2.2	Proportion units next steps	67
2.3	Proportion units advanced	71
2.4	Proportion scales introduction	75
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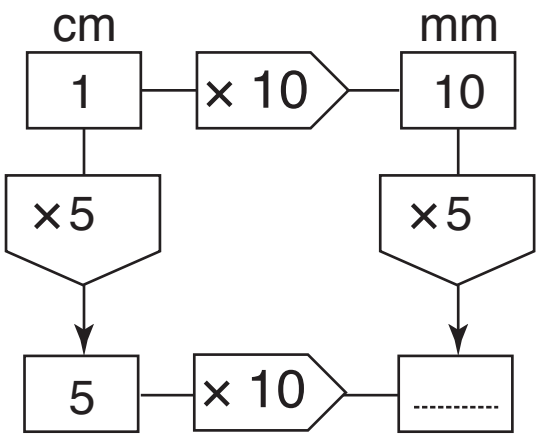
2.1 Proportion units introduction 1

F/H

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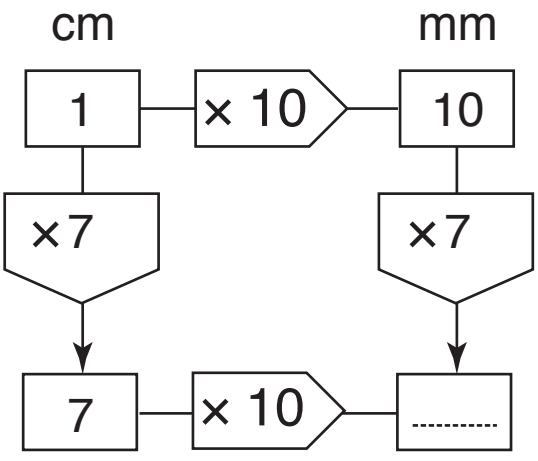


1 1 cm = 10 mm
Convert 5 cm to mm.



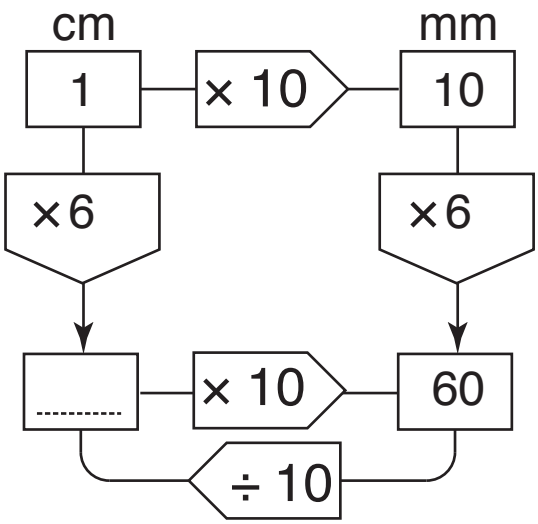
Answer _____

2 1 cm = 10 mm
Convert 7 cm to mm.



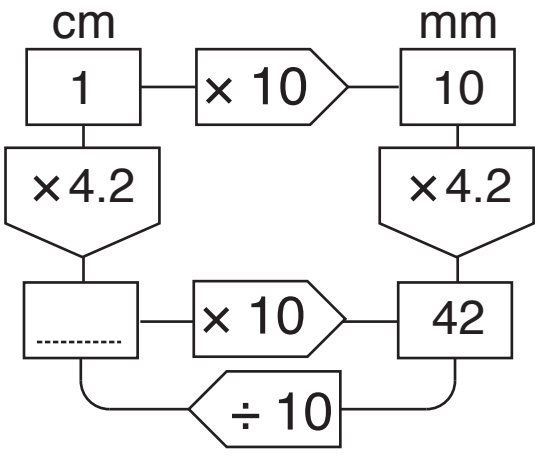
Answer _____

3 1 cm = 10 mm
Convert 60 mm to cm.



Answer _____

4 1 cm = 10 mm
Convert 42 mm to cm.



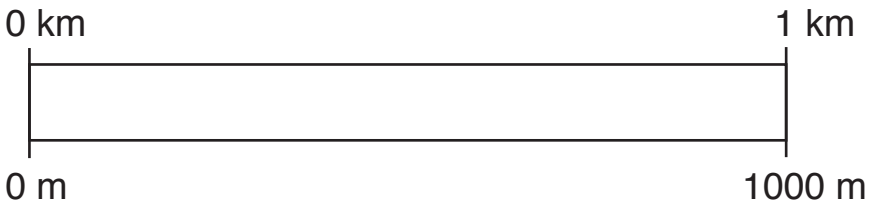
Answer _____

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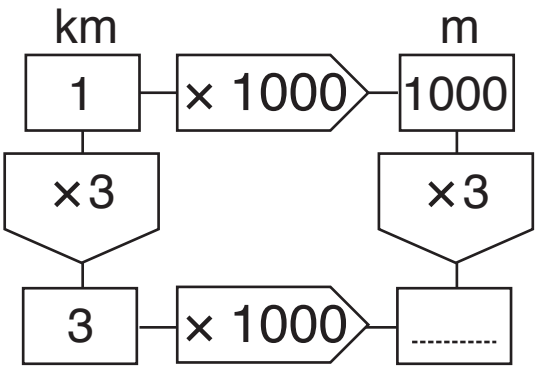
2.1 Proportion units introduction 2

F/H

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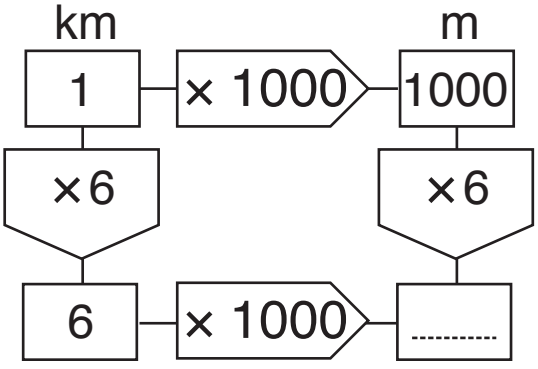


1 1 km = 1000 m
Convert 3 km to m.



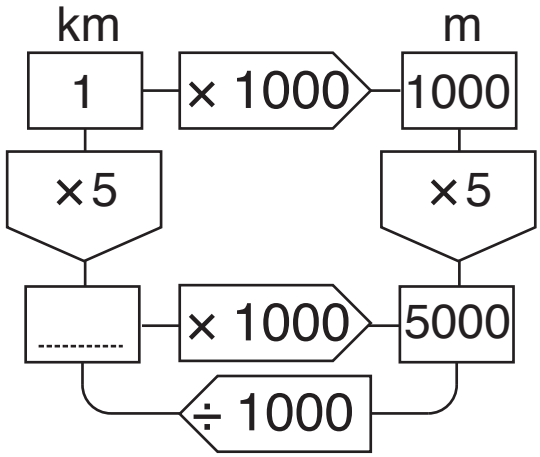
Answer _____

2 1 km = 1000 m
Convert 6 km to m.



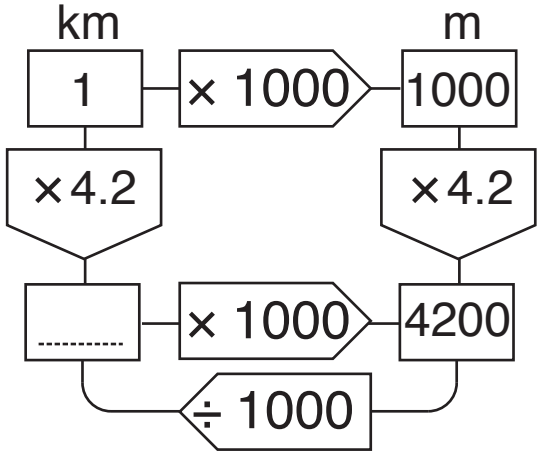
Answer _____

3 1 km = 1000 m
Convert 5000 m to km.



Answer _____

4 1 km = 1000 m
Convert 4200 m to km.



Answer _____

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2.1 Proportion units introduction: Test

F/H

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1 John cycles for 3 km.
Convert 3 km to metres.

Answer _____

2 Sarah measures her desk.
The width is 70 cm.
Convert 70 cm to millimetres.

Answer _____

3 A bottle holds 3 litres of water.
Convert 3 litres to millilitres.

Answer _____

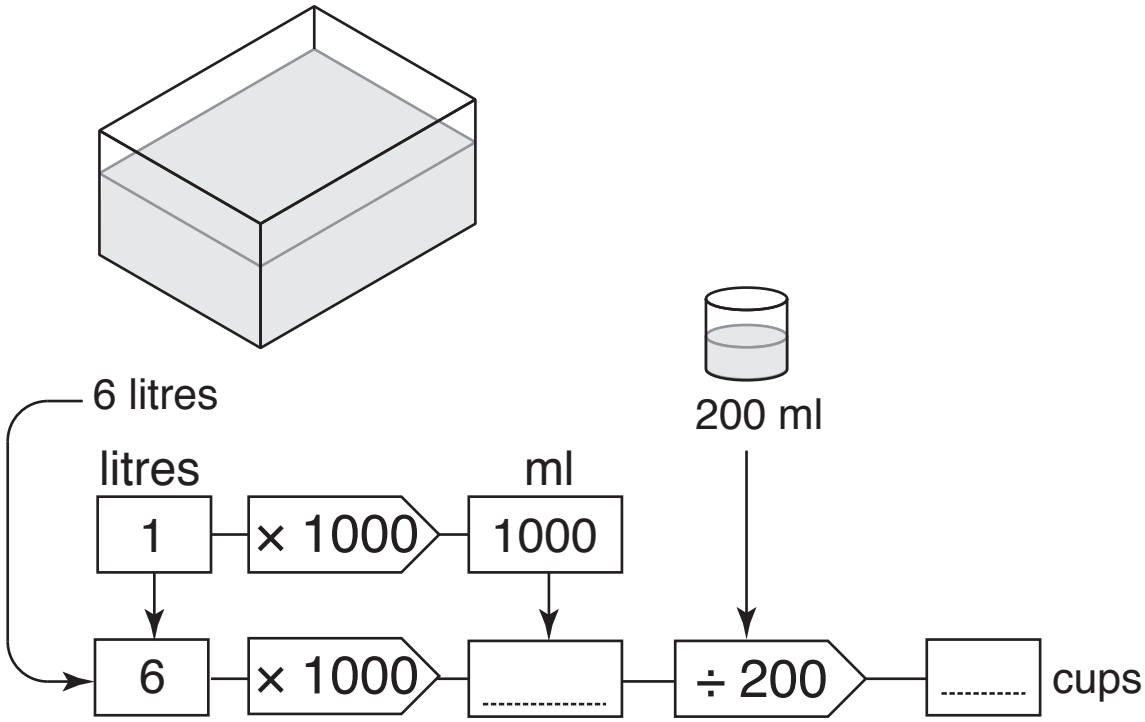
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2.2 Proportion units next steps 1

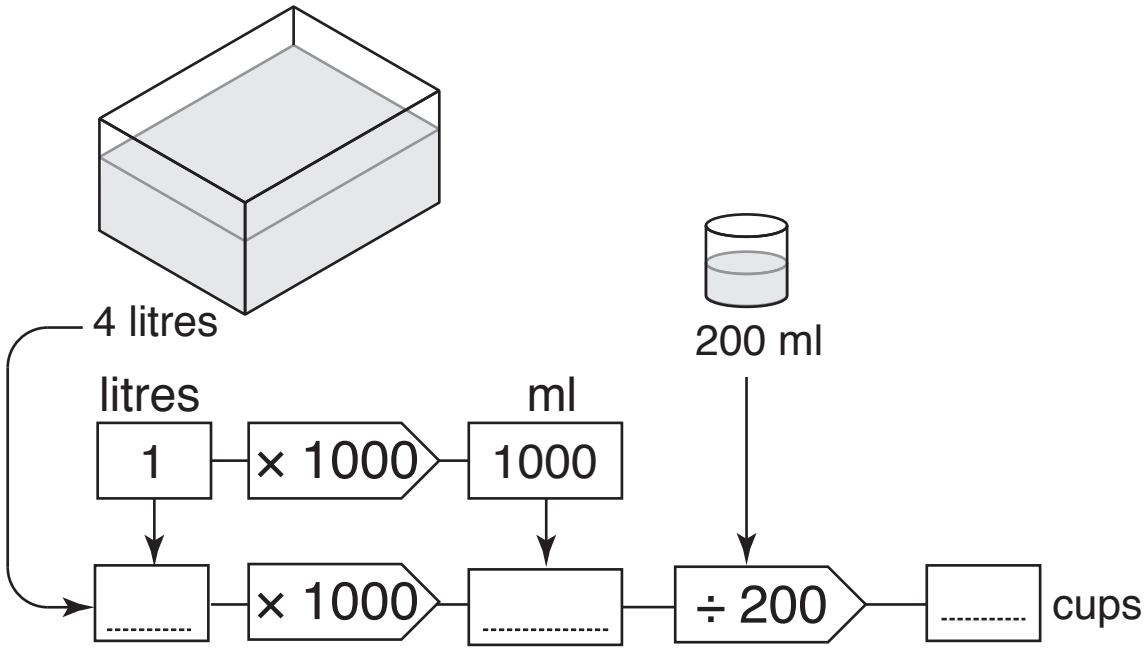
F/H

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1 There are **6 litres** of water in a water **container**.
A **cup** holds **200 ml** of water.
How many cups can be **filled** using the water in the water container.



2 There are **4 litres** of water in a water **container**.
A **cup** holds **200 ml** of water.
How many cups can be **filled** using the water in the water container.



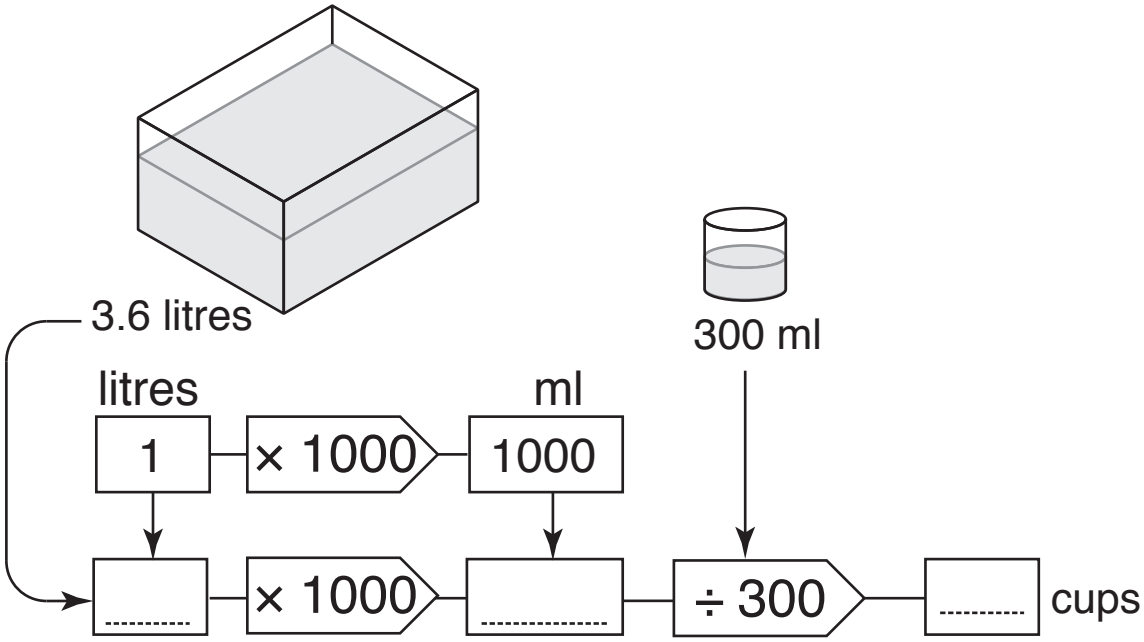
© Toticity Limited

2.2 Proportion units next steps 2

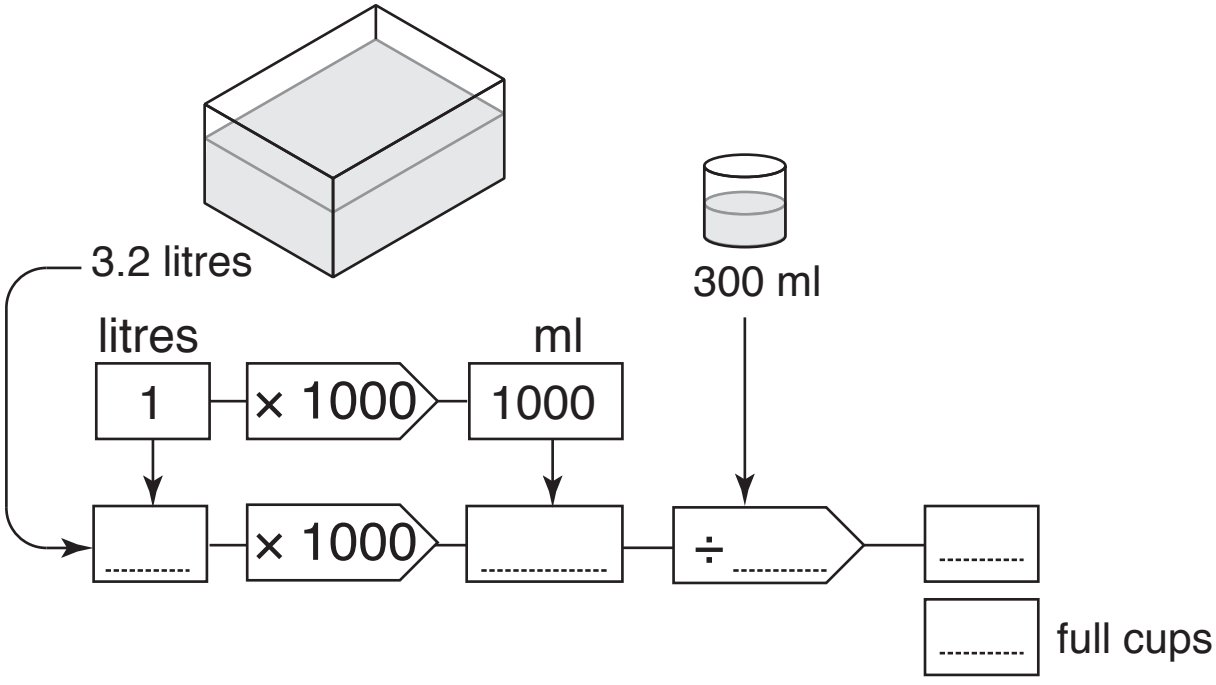
F/H

Licensed to The King's School, Devon

1 There are **3.6 litres** of water in a water **container**.
A **cup** holds **300 ml** of water.
How many cups can be **filled** using the water in the water container.



2 There are **3.2 litres** of water in a water **container**.
A **cup** holds **300 ml** of water.
How many cups can be **completely filled** using the water in the water container.



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2.2 Proportion units next steps: Test

F/H

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1 There are **4.8 litres** of water in a water **container**.
A **cup** holds **400 ml** of water.
How many cups can be **filled** using the water in the water container.

Answer _____

2 There are **4.6 litres** of water in a water **container**.
A **cup** holds **500 ml** of water.
How many cups can be **filled** using the water in the water container.

Answer _____

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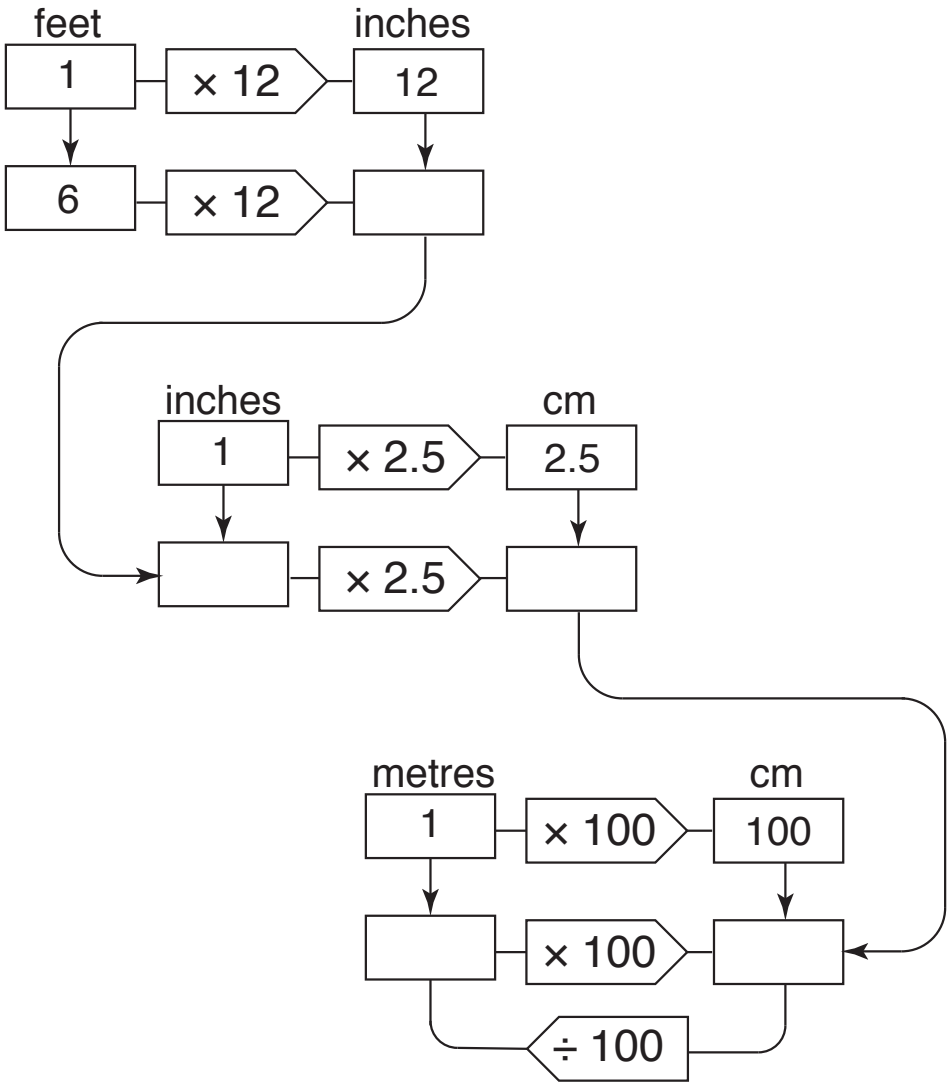
2.3 Proportion units advanced 1

F/H

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1 1 foot = 12 inches
1 inch = 2.5 cm
1 metre = 100 cm

Use the conversions given to show that **6 feet** is approximately **1.8 metres**.



Answer _____

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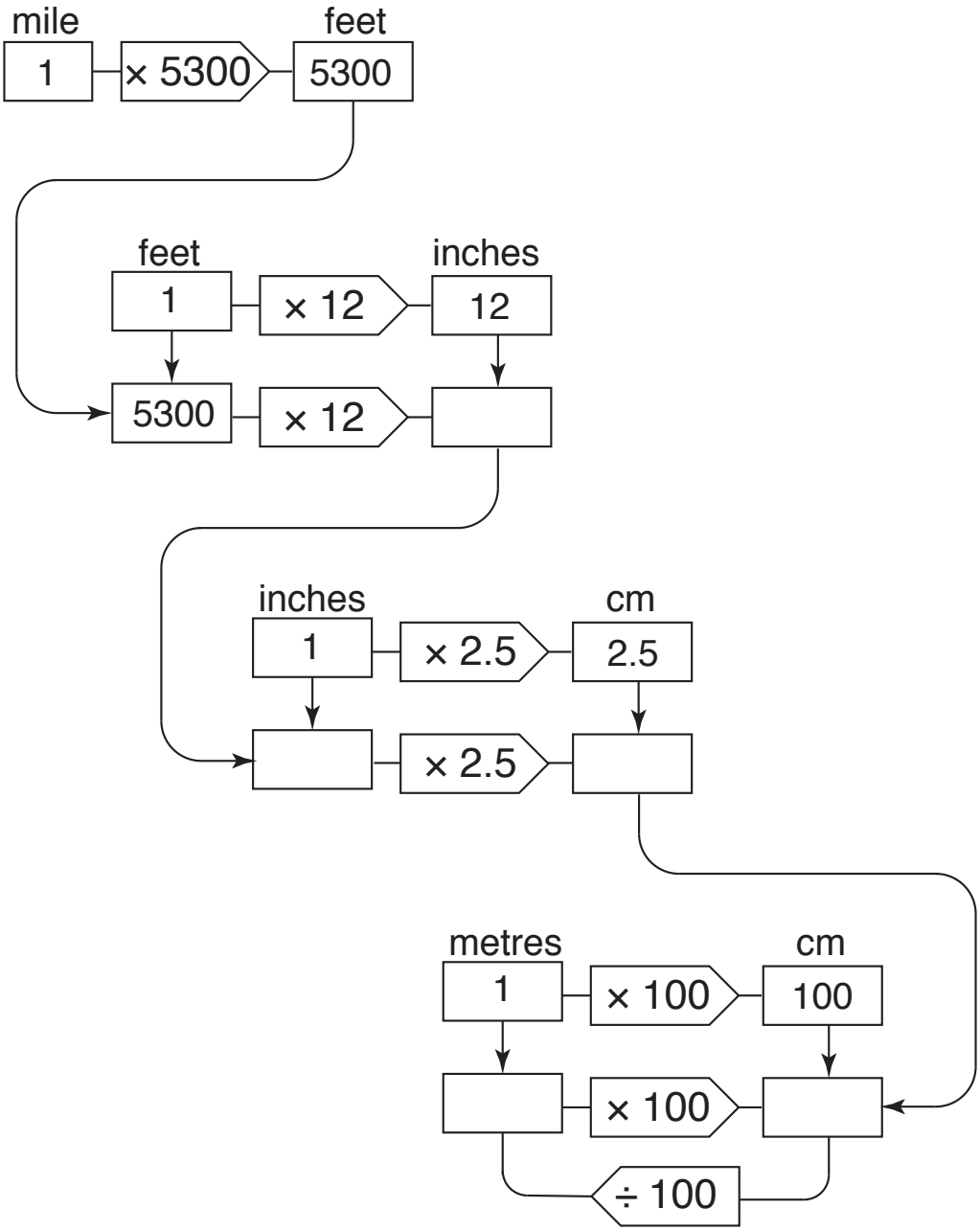
2.3 Proportion units advanced 2

F/H

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1 1 mile = 5300 feet
1 foot = 12 inches
1 inch = 2.5 cm
1 metre = 100 cm

Use the conversions given to show that **1 mile** is approximately **1600 metres**.



Answer _____

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2.3 Proportion units advanced: Test

F/H

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1 1 foot = 12 inches
1 inch = 2.5 cm
1 metre = 100 cm

Use the conversions given to show that **5 feet** is approximately **1.5 metres**.

Answer _____

2 1 gallon = 8 pints
1 pint = 568 ml
1 litre = 1 000 ml

Use the conversions given to show that **1 gallon** is approximately **4.5 litres**.

Answer _____

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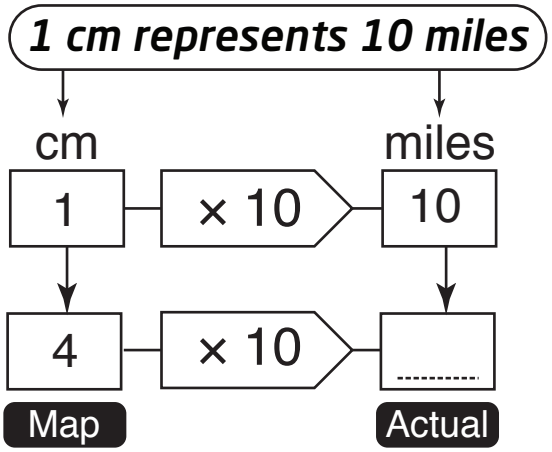
2.4 Proportion scales introduction 1

F/H

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1 Here is the scale on a map.
Scale: **1 cm** represents **10 miles**

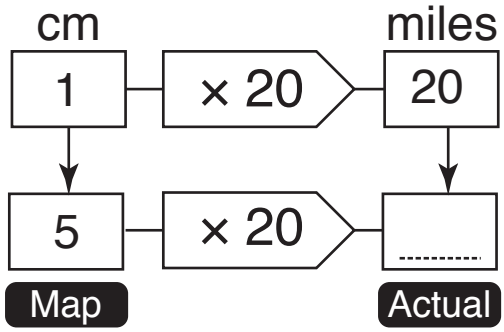
Work out the number of miles represented by **4 cm** on the map.



Answer _____

2 Here is the scale on a map.
Scale: **1 cm** represents **20 miles**

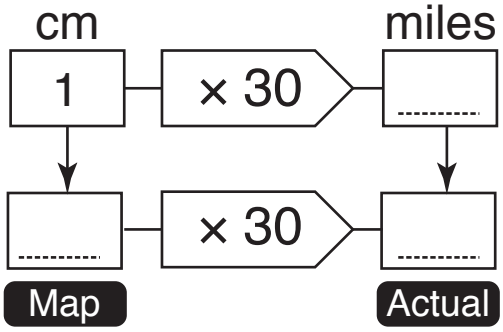
Work out the number of miles represented by **5 cm** on the map.



Answer _____

3 Here is the scale on a map.
Scale: **1 cm** represents **30 miles**

Work out the number of miles represented by **6 cm** on the map.



Answer _____

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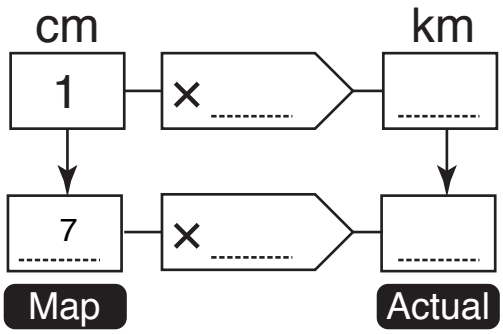
2.4 Proportion scales introduction 2

F/H

Licensed to The King's School, Devon

1 Here is the scale on a map.
Scale: **1 cm** represents **5 km**

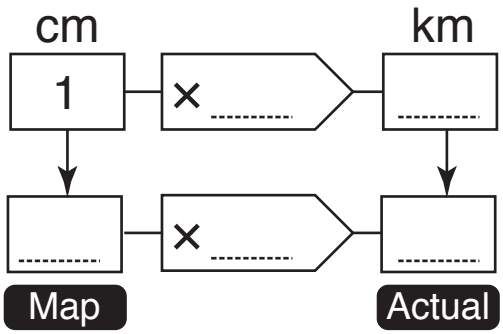
Work out the number of kilometres represented by **7 cm** on the map.



Answer _____

2 Here is the scale on a map.
Scale: **1 cm** represents **6 km**

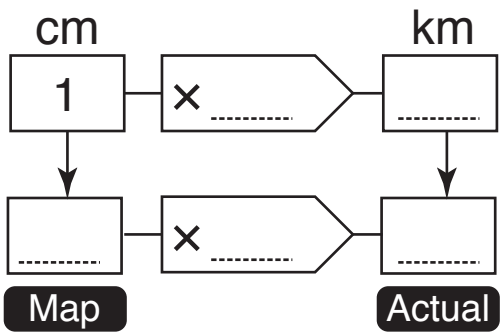
Work out the number of kilometres represented by **2.5 cm** on the map.



Answer _____

3 Here is the scale on a map.
Scale: **1 cm** represents **200 km**

Work out the number of kilometres represented by **15 cm** on the map.



Answer _____

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2.4 Proportion scales introduction: Test

F/H

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1 Here is the scale on a map.
Scale: **1 cm** represents **5 km**

Work out the number of kilometres represented by **9 cm** on the map.

Answer _____

2 Here is the scale on a map.
Scale: **1 cm** represents **150 km**

Work out the number of kilometres represented by **2.5 cm** on the map.

Answer _____

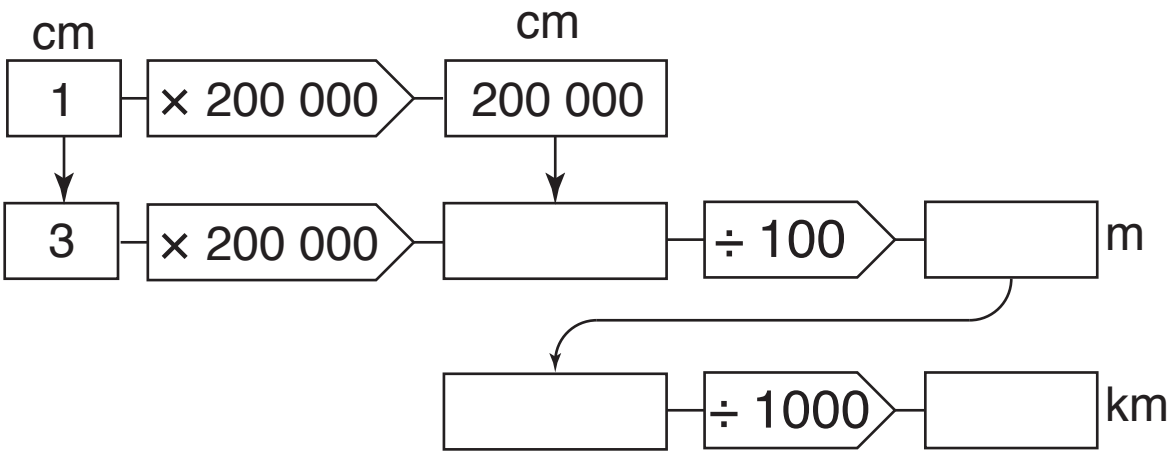
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2.5 Proportion scales next steps 1

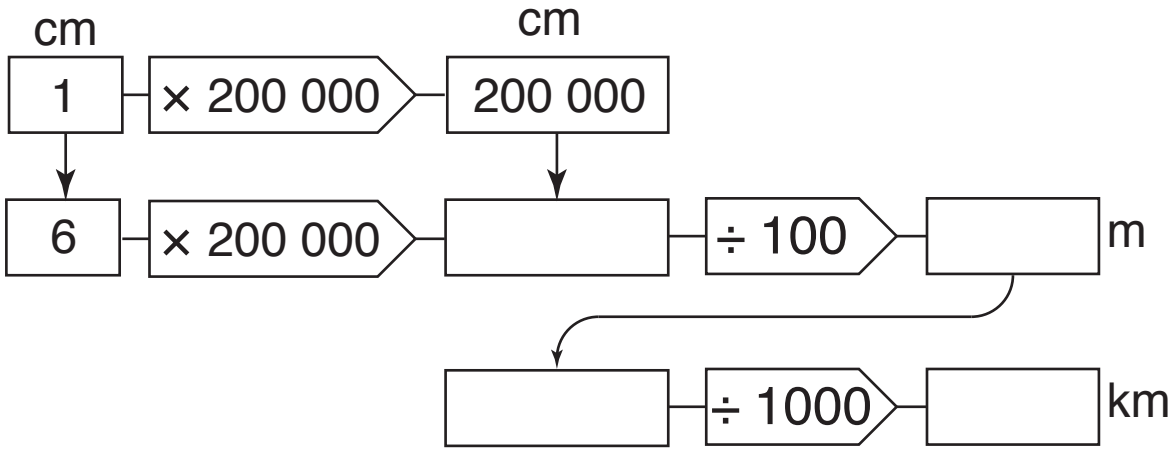
F/H

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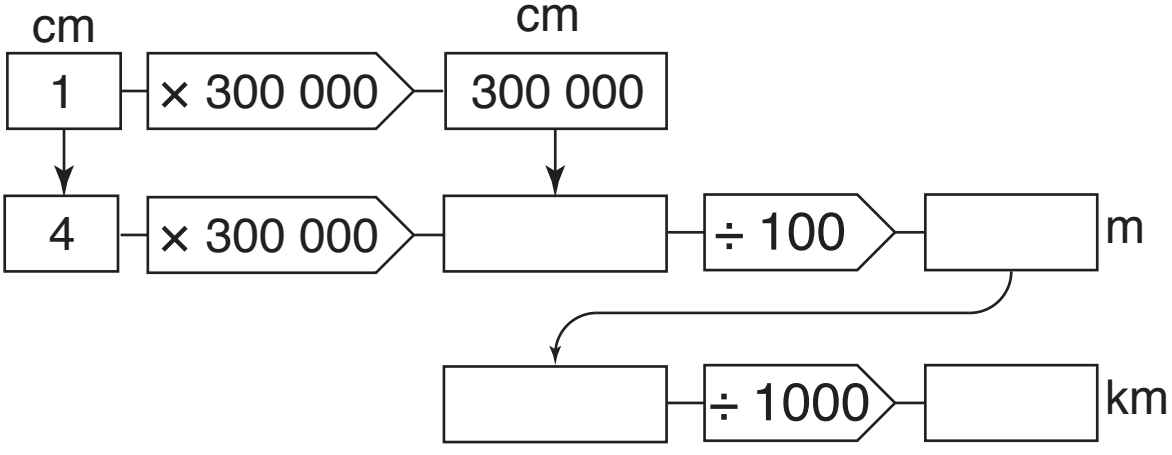
1 The scale on a map is 1 : 200 000
Work out the number of kilometres represented by 3 cm on the map.



2 The scale on a map is 1 : 200 000
Work out the number of kilometres represented by 6 cm on the map.



3 The scale on a map is 1 : 300 000
Work out the number of kilometres represented by 3 cm on the map.



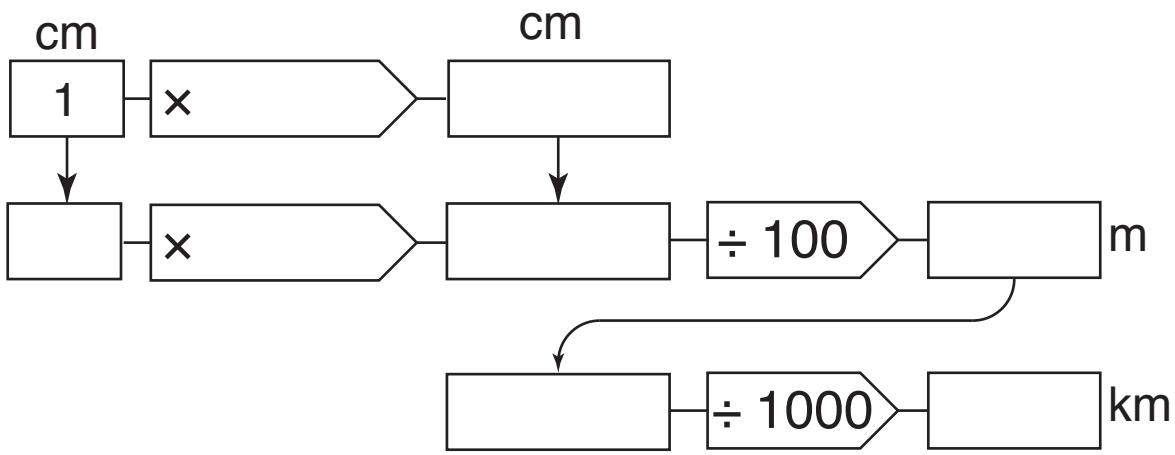
© Toticity Limited

2.5 Proportion scales next steps 2

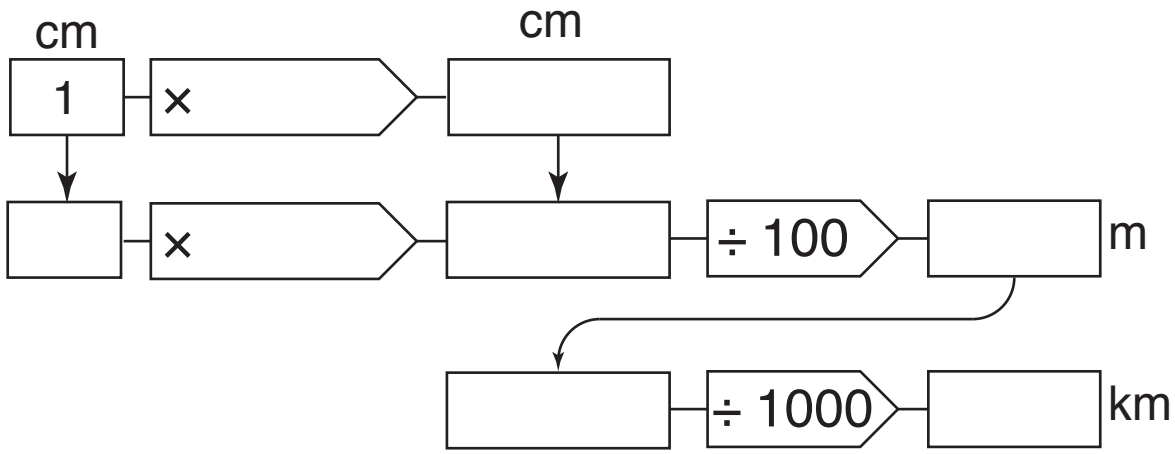
F/H

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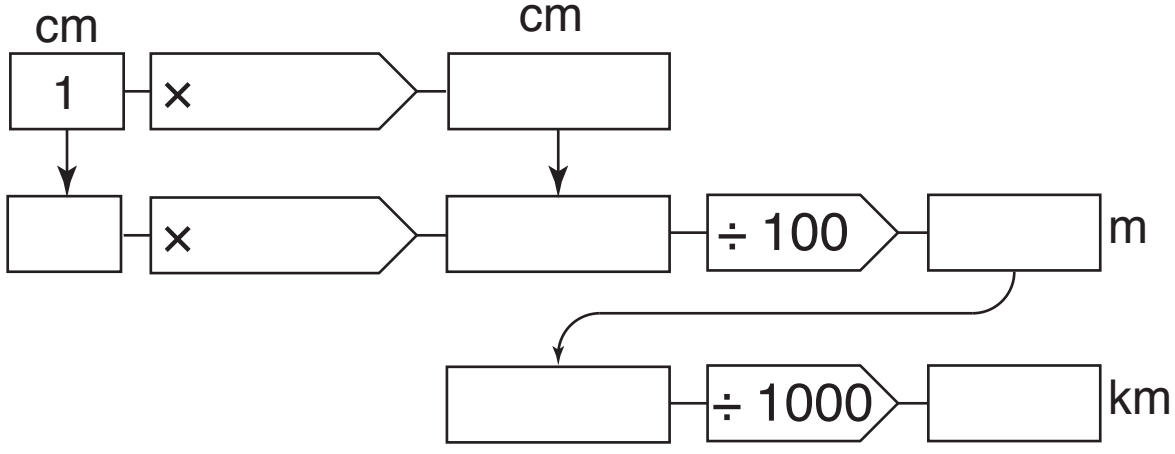
1 The scale on a map is 1 : 200 000
Work out the number of kilometres represented by 9 cm on the map.



2 The scale on a map is 1 : 10 000
Work out the number of kilometres represented by 8 cm on the map.



3 The scale on a map is 1 : 20 000
Work out the number of kilometres represented by 7 cm on the map.



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2.5 Proportion scales next steps: Test

F/H

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1 The scale on a map is 1 : 400 000
Work out the number of kilometres represented by 2 cm on the map.

Answer _____

2 The scale on a map is 1 : 50 000
Work out the number of kilometres represented by 9 cm on the map.

Answer _____

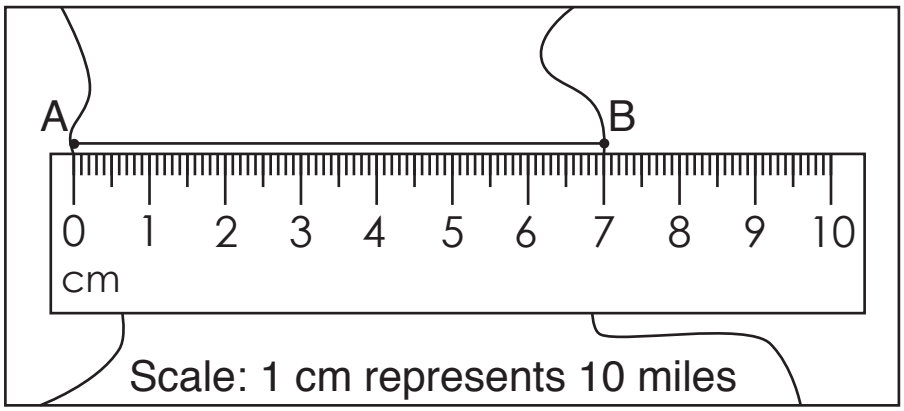
© *Toticity Limited*

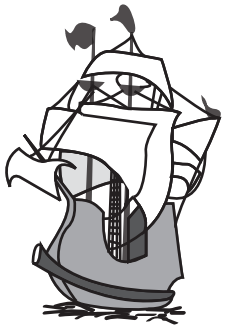
2.6 Proportion scales advanced 1

F/H

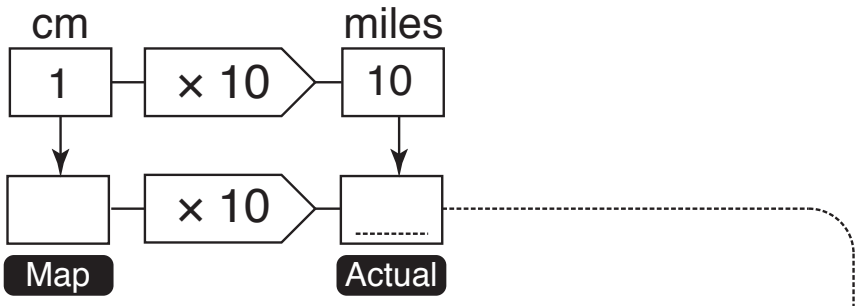
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1 This map shows two ports, A and B.

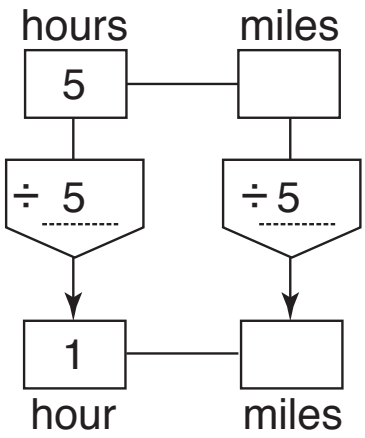




1 a A boat sales from A to B.
Calculate the distance from A to B.



1 b The boat takes 5 hours to sail directly from A to B.
Calculate the boat's average speed.



Answer _____ mph

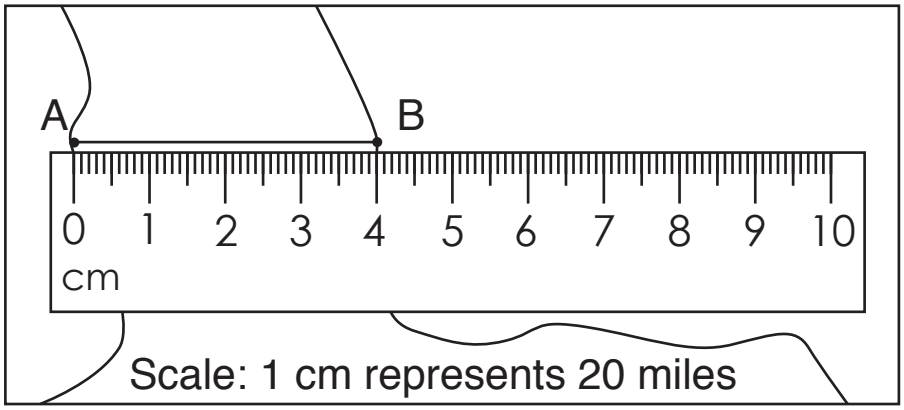
© Toticity Limited

2.6 Proportion scales advanced 2

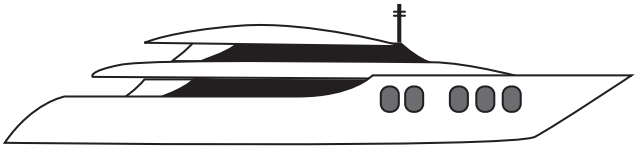
F/H

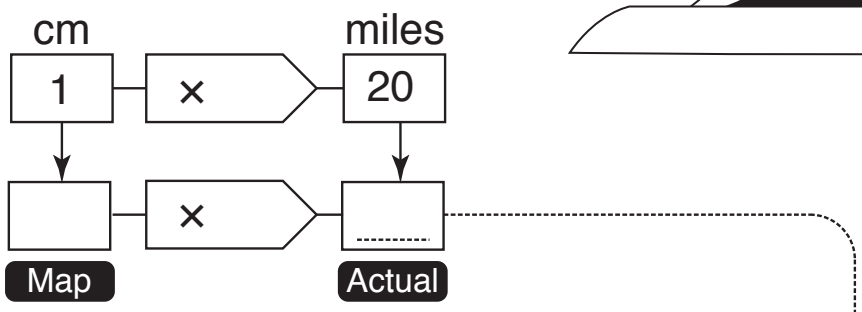
Licensed to The King's School, Devon

1 This map shows two ports, A and B.

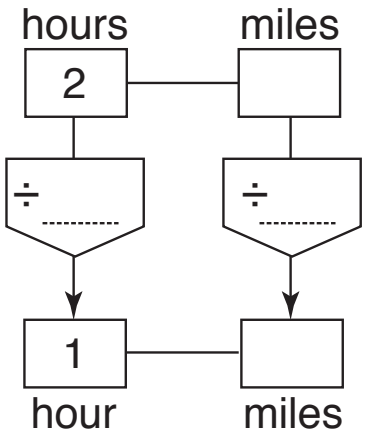


1 a A boat sales from A to B.
Calculate the distance from A to B.





1 b The boat takes 2 hours to sail directly from A to B.
Calculate the boat's average speed.



Answer _____ mph

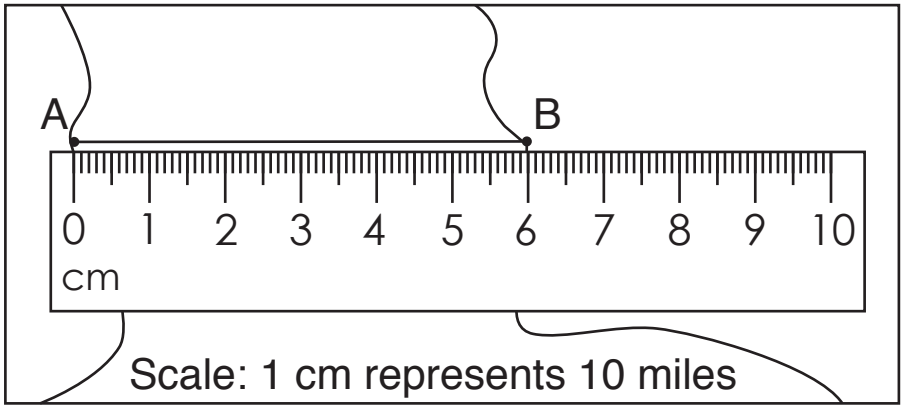
© Toticity Limited

2.6 Proportion scales advanced: Test

F/H

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1 The map shows two ports, A and B.



A boat takes 4 hours to sail directly from A to B.
Calculate the boat's average speed.

Answer _____

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2.7 Proportion exchange rate introduction 1

F/H

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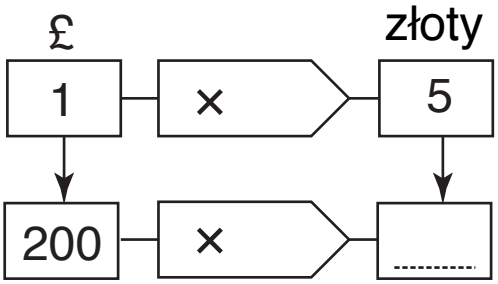


1 John is going to Poland.
Here is the exchange rate

£1 = 5 złoty

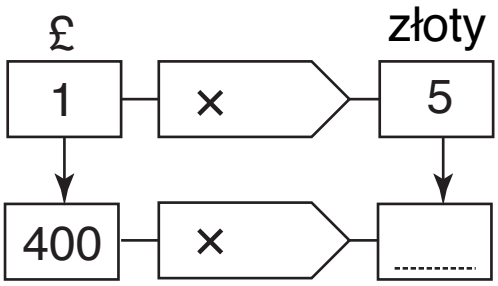
1 zł	1 zł	1 zł	1 zł	1 zł
£1				

1 a John exchanges £200.
How many złoty does he receive?



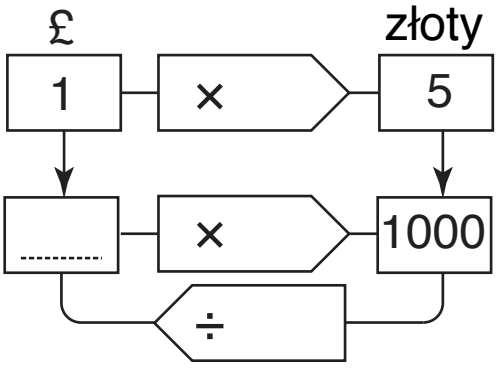
Answer _____ złoty

1 b Jane exchanges £400.
How many złoty does she receive?



Answer _____ złoty

1 c After her holiday, Jane exchanges 1000 zł to pounds.
How many pounds does she receive?



Answer £ _____

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2.7 Proportion exchange rate introduction 2

F/H

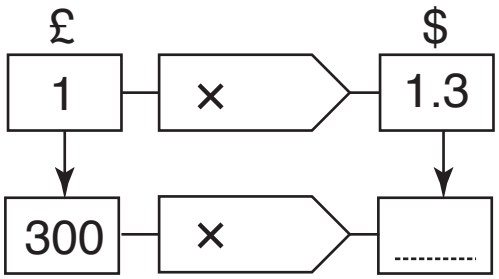
Licensed to The King's School, Devon

1 Mike is going to the USA.
Here is the exchange rate



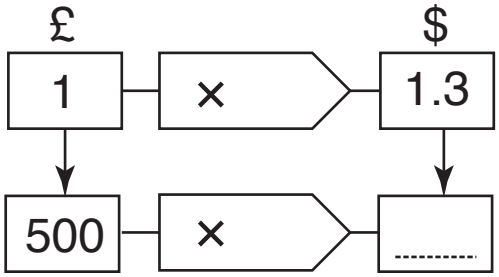
£1 = $1.30

1 a Mike exchanges £300.
How many dollars does he receive?



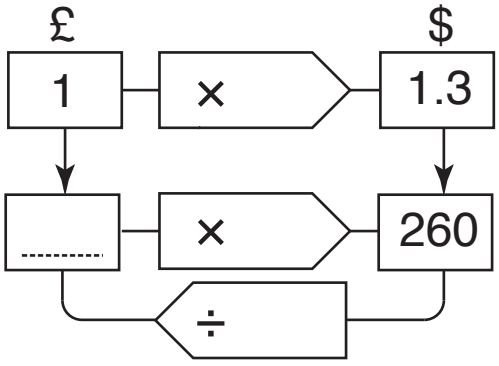
Answer $ _____

1 b Emilia exchanges £500.
How many dollars does she receive?



Answer $ _____

1 c After her holiday, Emilia exchanges $260 to pounds.
How many pounds does she receive?



Answer £ _____

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2.7 Proportion exchange rate introduction: Test

F/H

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1 Annie is going to Canada.
Here is the exchange rate

£1 = Can$1.70



1 a Annie exchanges £400.
How many Canadian dollars does she receive?

Answer Can$ _____

1 b Amy exchanges £500.
How many Canadian dollars does she receive?

Answer Can$ _____

1 c After her holiday, Amy exchanges Can$340 to pounds.
How many pounds does she receive?

Answer £ _____

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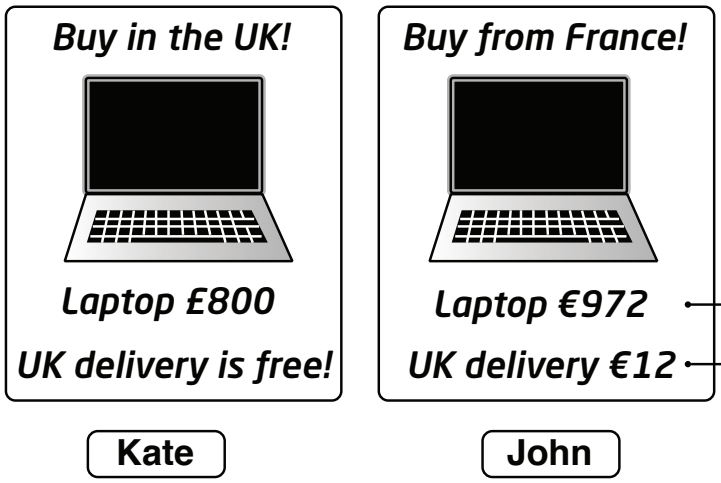
2.8 Proportion exchange rate next steps 1

F/H

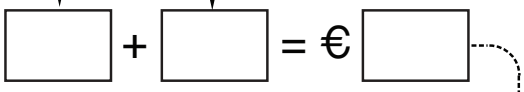
Licensed to The King's School, Devon

1 Kate buys a laptop in the UK for **£800**
Delivery is **free**.

John buys the same model of laptop from France for **€972**.
He pays **€12** for **delivery**.

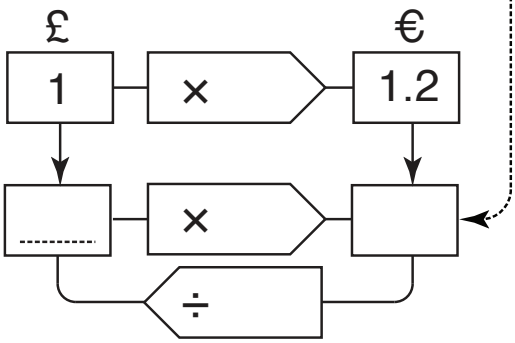


1 a Calculate the **total** cost in **euros** that John pays.



1 b Here is the exchange rate

£1 = €1.20



Calculate the total cost in **£s** that John pays.

1 c Including the delivery charge, whose laptop is **cheaper,** John's or Kate's?

Answer _____

© Toticity Limited

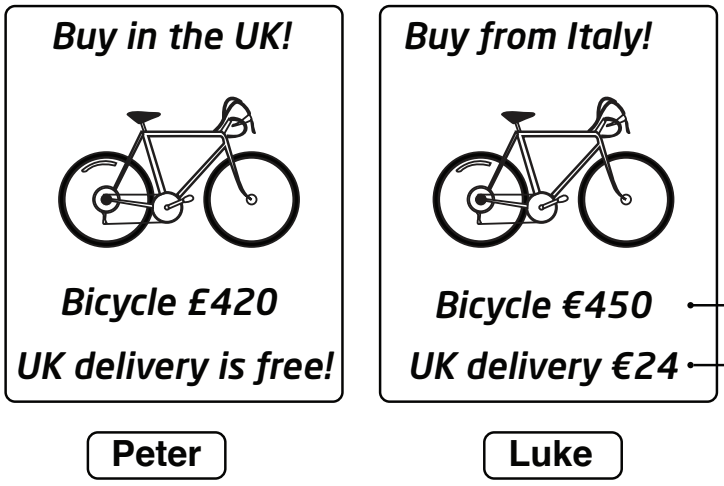
2.8 Proportion exchange rate next steps 2

F/H

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1 Peter buys a bicycle in the UK for **£420**
Delivery is **free**.

Luke buys the same model of bicycle from Italy for **€450**.
He pays **€24** for **delivery**.



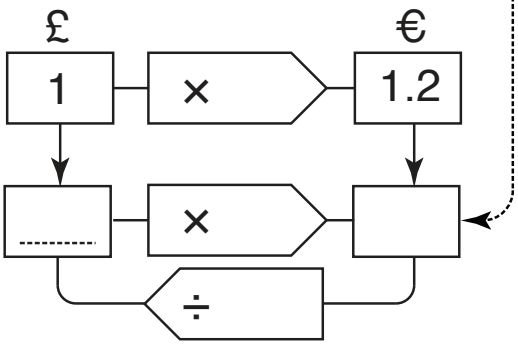
1 a Calculate the **total** cost in **euros** that **Luke** pays.

[ ] + [ ] = € [ ]

1 b Here is the exchange rate

£1 = €1.20

Calculate the total cost in **£s** that **Luke** pays.



1 c Including the delivery charge, whose bicycle is **cheaper,** Peter's or Luke's?

Answer _____

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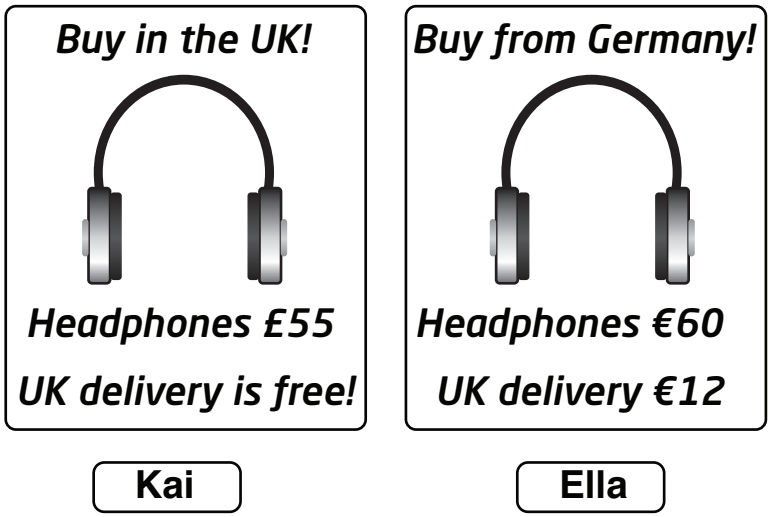
2.8 Proportion exchange rate next steps: Test

F/H

Licensed to The King's School, Devon

1 Kai buys some headphones in the UK for **£55**
Delivery is **free**.

Ella buys the same model of headphones from Germany for **€60**.
She pays **€12** for **delivery**.



Including the delivery charge, whose headphones are **cheaper**?
You **must** show your working.

Answer _____

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2.9 Proportion exchange rate advanced 1

F/H

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1a Sylvia pays **£200** for a plane ticket.
The exchange rate is **£1 = 1.15 euros**
What is the **cost** of the plane ticket in **euros**?



£		€
1	×	1.15
200	×	

1b Sylvia pays €270 for five nights in a hotel.



Work out the total cost of the hotel and plane ticket.

[ ] + [ ] = € [ ]

1c What **percentage** of the **total cost** of the plane ticket and hotel does Sylvia pay for the **hotel**?

$$\frac{\text{Hotel}}{\text{Total}} \times 100 = \square\ \%$$

Answer _____ %

© Toticity Limited

2.9 Proportion exchange rate advanced 2

F/H

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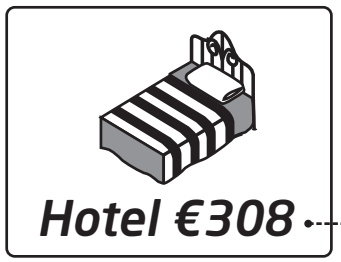
1a Andy pays **£80** for a train ticket.
The exchange rate is **£1 = 1.15 euros**
What is the **cost** of the train ticket in **euros**?



£ 1 × € 1.15

80 × .....

1b Andy pays €308 for four nights in a hotel.



Work out the total cost of the hotel and train ticket.

..... + ... = € .....

1c What **percentage** of the **total cost** of the train ticket and hotel does Andy pay for the **hotel**?

$$\frac{\text{Hotel}}{\text{Total}} \times 100 = \square\ \%$$

Answer _____ %

© Toticity Limited

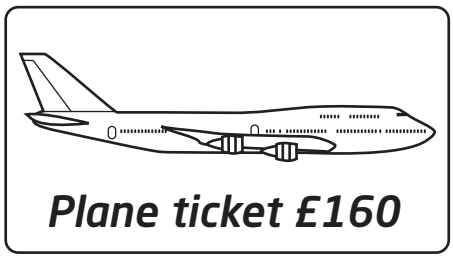
2.9 Proportion exchange rate advanced: Test

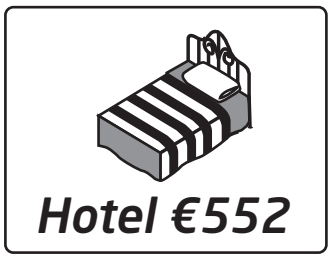
F/H

Licensed to The King's School, Devon

1 Megan pays **£160** for a **plane** ticket.
She also pays **€552** for a **hotel**.

The exchange rate is **£1 = €1.15**





£1 = €1.15

What **percentage** of the **total** cost of the ticket and hotel does Megan pay for the **hotel**?

Answer _____ %

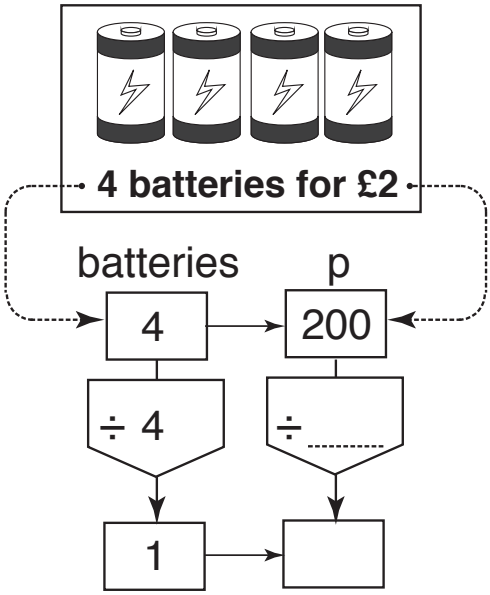
© *Toticity Limited*

2.10 Proportion best buy introduction 1

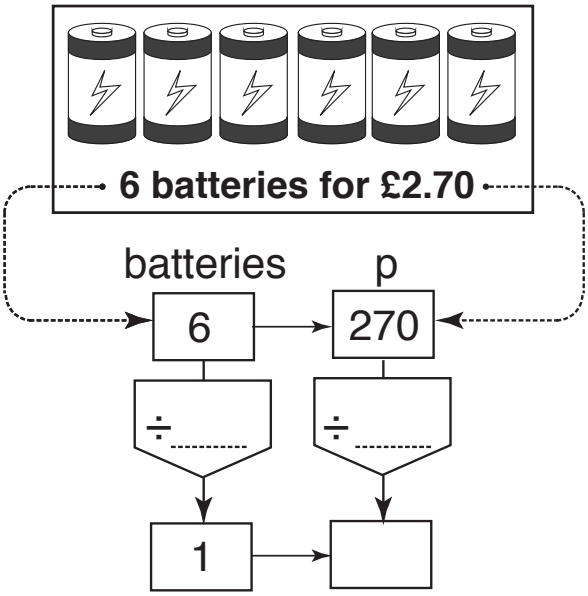
F/H

Licensed to The King's School, Devon

1a A pack of **4** batteries costs **£2**
How much does each battery cost?



1b A pack of **6** batteries of the same type costs **£2.70**
How much does each battery cost?



1c Which pack is better value?
Tick a your answer.

☐ Pack of 4

☐ Pack of 6

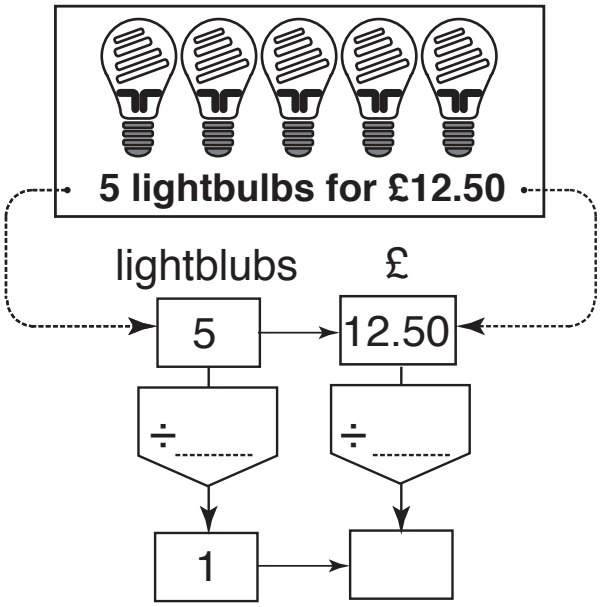
© Toticity Limited

2.10 Proportion best buy introduction 2

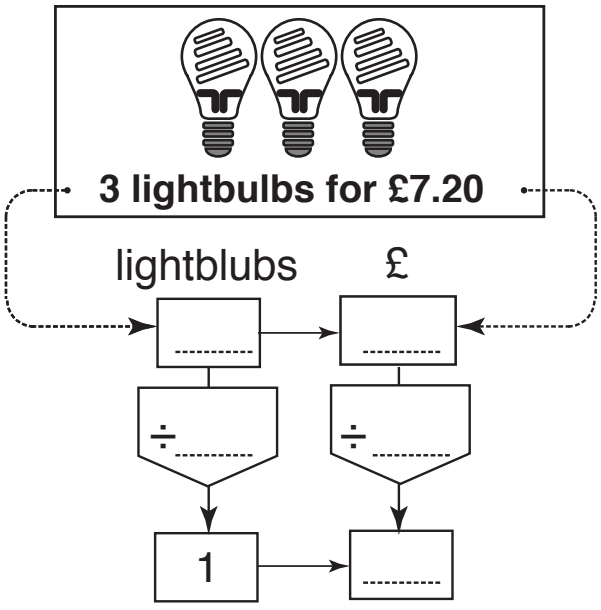
F/H

Licensed to The King's School, Devon

1a A pack of **5** lightbulbs costs **£12.50**
How much does each lightbulb cost?



1b A pack of **3** lightbulbs of the same type costs **£7.20**
How much does each lightbulb cost?



1c Which pack is better value?
Tick a your answer.

☐ Pack of 5

☐ Pack of 3

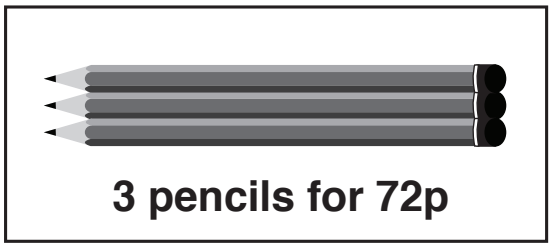
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2.10 Proportion best buy introduction: Test

F/H

Licensed to The King's School, Devon

1a A pack of 3 pencils costs 72p



How much does each pencil cost?

Answer _____

1b A pack of 5 pencils of the same type costs £1.25



Is this pack better value?

You **must** show your working out.

Answer _____

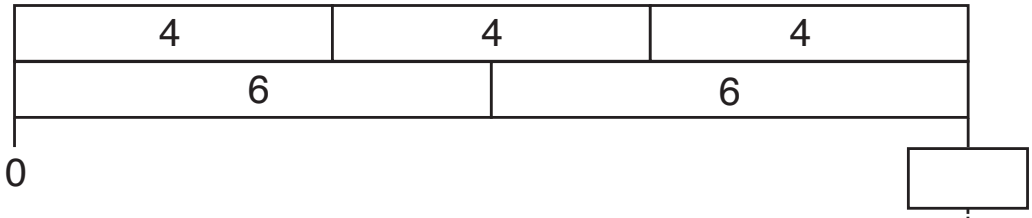
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2.11 Proportion best buy next steps 1

F/H

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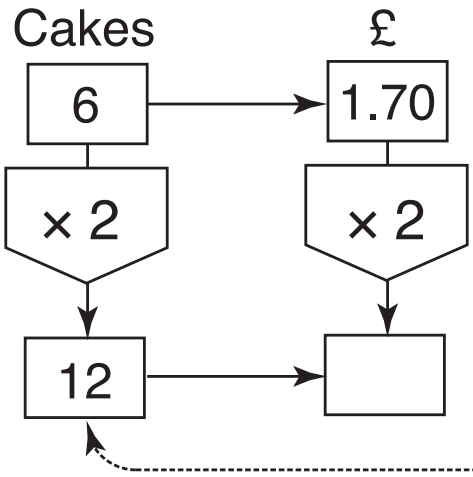
1a Calculate the lowest common multiple of 4 and 6



1b Cakes are sold in packs of 6



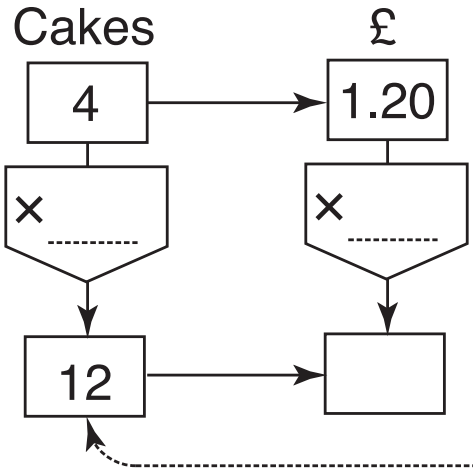
Calculate the cost of buying 12 cakes.



1c Cakes are also sold in packs of 4



Calculate the cost of buying 12 cakes.



1d Which pack is better value?

Answer _____

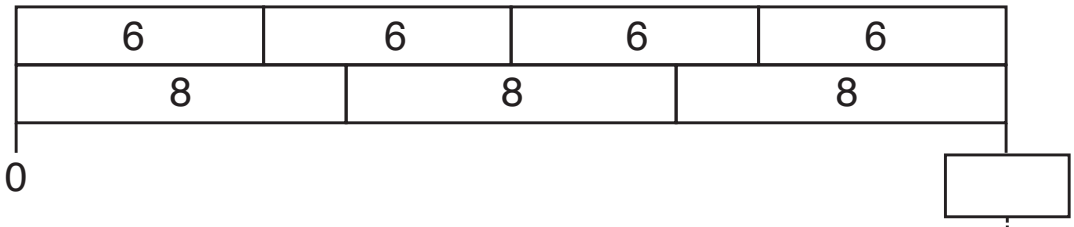
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2.11 Proportion best buy next steps 2

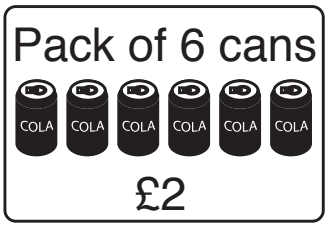
F/H

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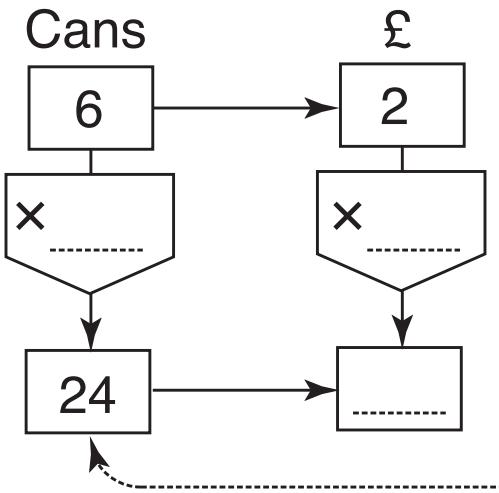
1a Calculate the least common multiple of 6 and 8



1b Cola is sold in packs of 6



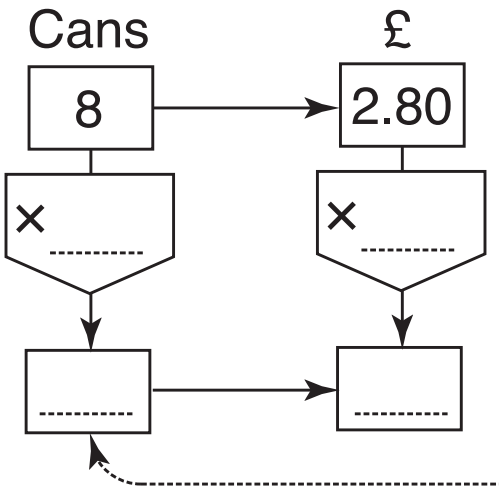
Calculate the cost of buying 24 cans.



1c Cola is also sold in packs of 8



Calculate the cost of buying 24 cans.



1d Which pack is better value ?

Answer _____

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2.11 Proportion best buy next steps: Test

F/H

Licensed to The King's School, Devon

1 Crisps come in multipacks of 3 bags and 4 bags.

Multipack of 3 bags	Multipack of 4 bags
	
£2	£2.70

Which multipack is better value?
You **must** show your working.

Answer _____

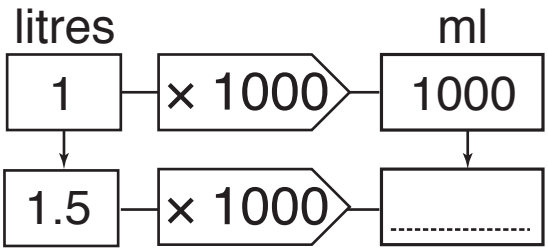
© *Toticity Limited*

2.12 Proportion best buy advanced 1

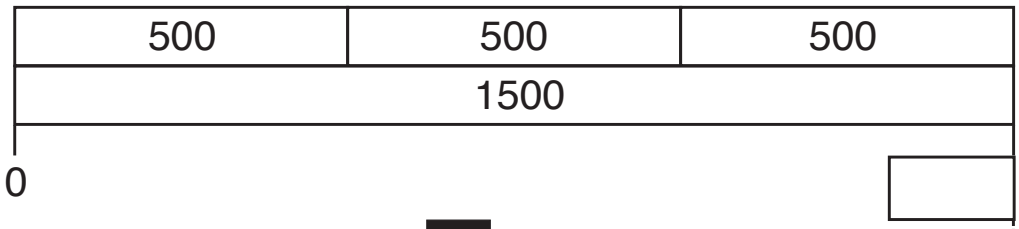
F/H

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1a Convert 1.5 litres to millilitres.

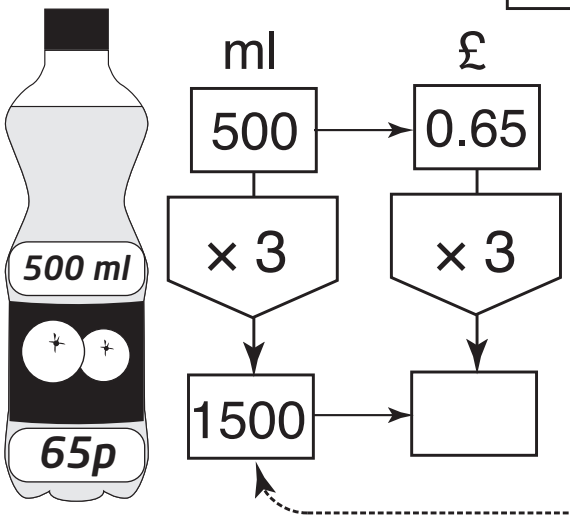


1b Calculate the lowest common multiple of 500 and 1500



1c Orange is sold in **500 ml** bottles.
The price is **65p**

Calculate the cost of buying **1500 ml**.



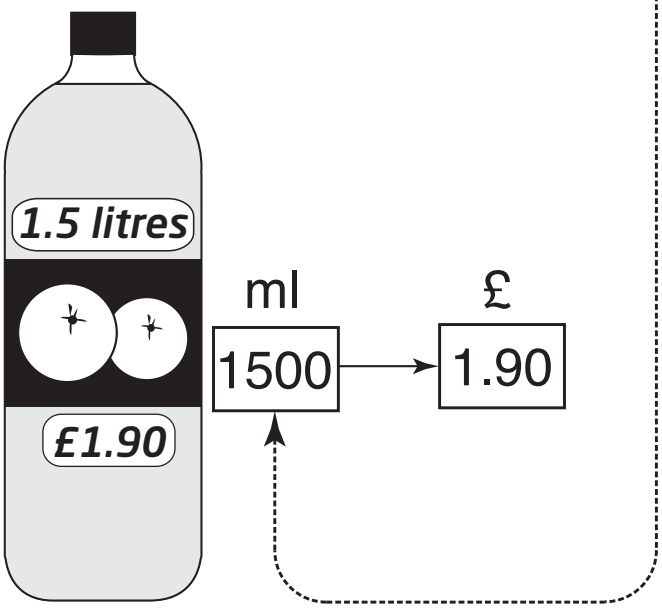
1d Orange is also sold in **1.5 litre** bottles.
The price is **£1.90**

Which bottle is better value for money?

Tick your answer

☐ 500 ml bottle

☐ 1.5 litre bottle



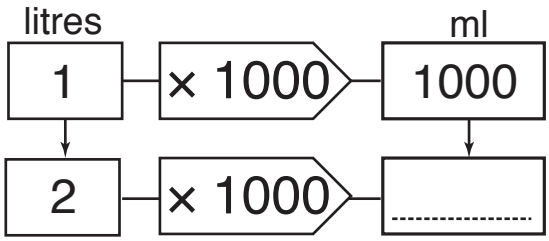
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2.12 Proportion best buy advanced 2

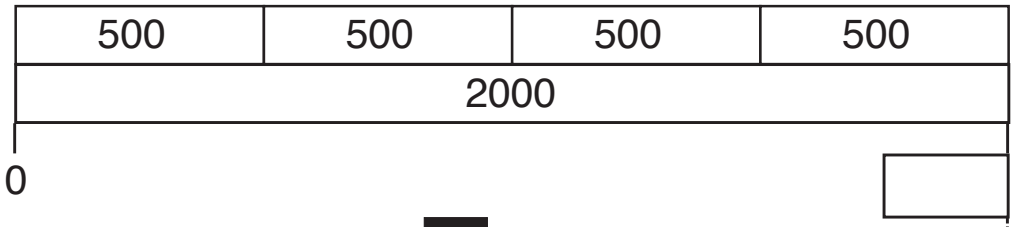
F/H

Licensed to The King's School, Devon

1a Convert 2 litres to millilitres.

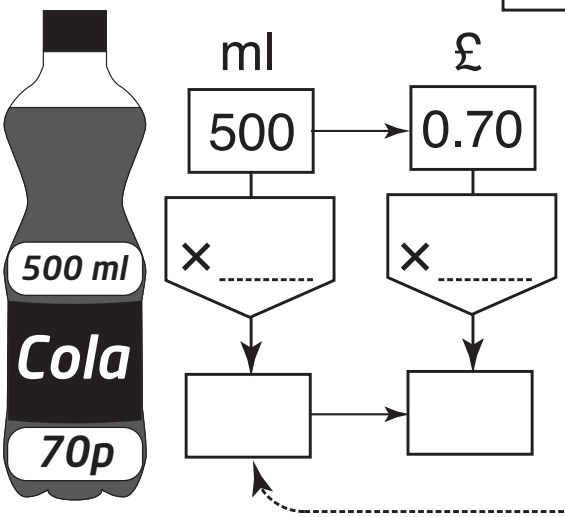


1b Calculate the lowest common multiple of 500 and 2000



1c Cola is sold in **500 ml** bottles.
The price is **70p**

Calculate the cost of buying **2000 ml**.



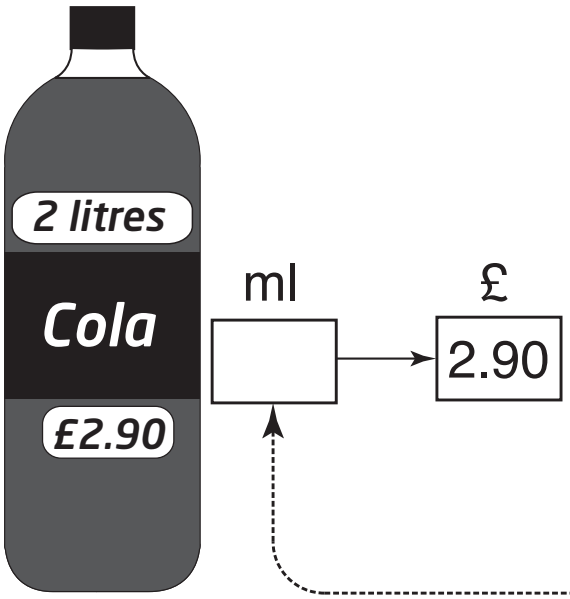
1d Cola is also sold in **2 litre** bottles.
The price is **£2.90**

Which bottle is better value for money?

Tick your answer

☐ 500 ml bottle

☐ 2 litre bottle



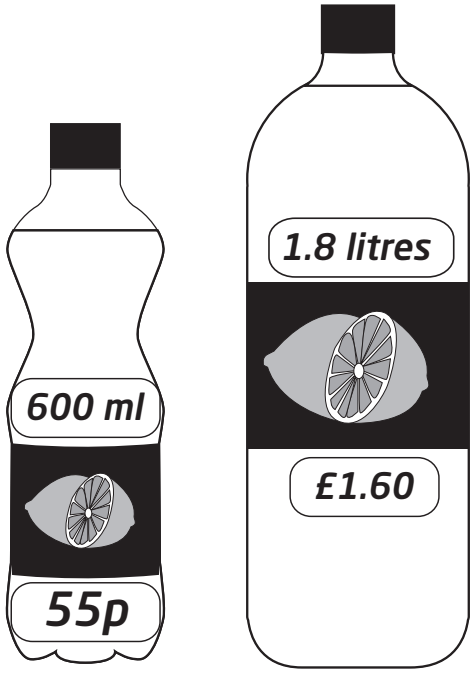
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2.12 Proportion best buy advanced: Test

F/H

Licensed to The King's School, Devon

1 Lemonade is sold in two sizes.



A **600 ml** bottle costs **55p**
A **1.8 litre** bottle costs **£1.60**

Which bottle is better value for money?
You **must** show your working.

Answer _____

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2.13 Proportion recipes introduction 1

F/H

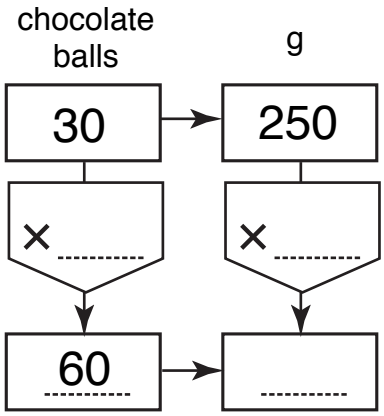
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1 Here is a list of the ingredients for making **30** chocolate balls.

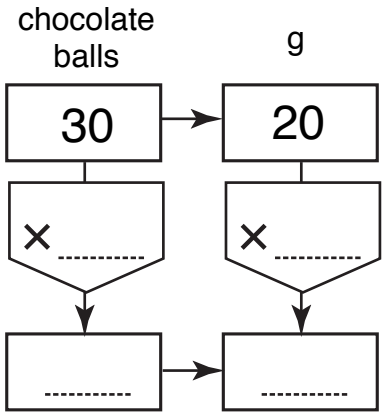
250g	crushed biscuits
20g	cocoa powder
400g	condensed milk
75g	coconut flakes

Sue wants to make **60** chocolate balls.
Work out how much of each ingredient she needs.

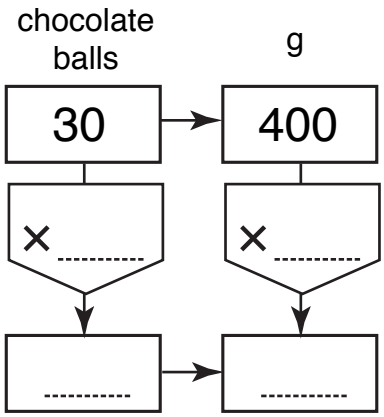
Crushed biscuits:



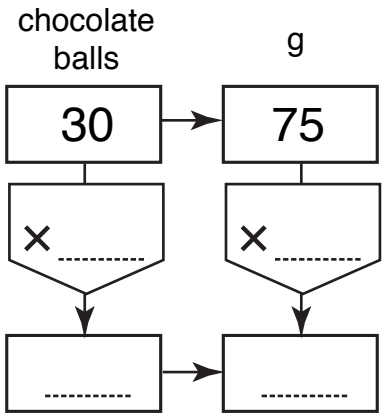
Cocoa Powder:



Condensed Milk:



Coconut Flakes:



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2.13 Proportion recipes introduction 2

F/H

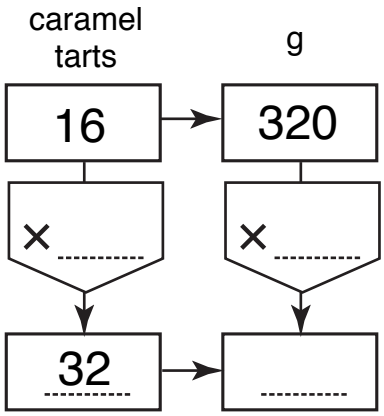
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1 Here is a list of the ingredients for making **16** caramel tarts.

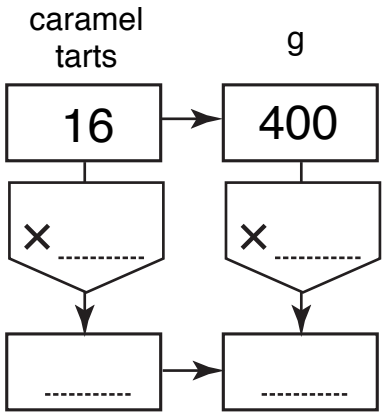
320g	short cut pastry
400g	condensed milk
100g	dark chocolate
120g	chopped nuts

Billy wants to make **32** caramel tarts.
Work out how much of each ingredient he needs.

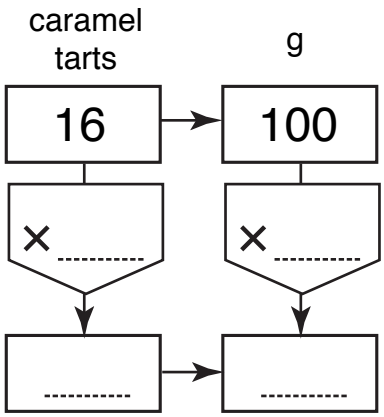
Short Cut Pastry:



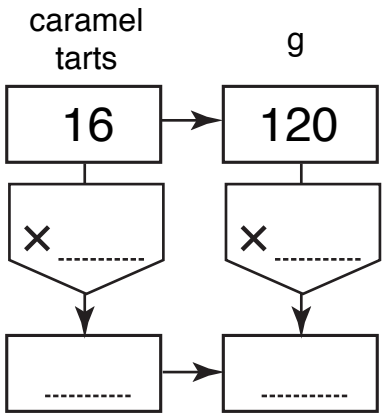
Condensed Milk:



Dark Chocolate:



Chopped Nuts:



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2.13 Proportion recipes introduction: Test

F/H

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1 Here is a list of the ingredients for making **6** pecan pies.

3	egg whites
200g	sugar
100g	chopped pecan nuts
85g	chopped crackers

Amy wants to make **12** pecan pies.
Work out how much of each ingredient she needs.

Answer _____ %

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2.14 Proportion recipes next steps 1

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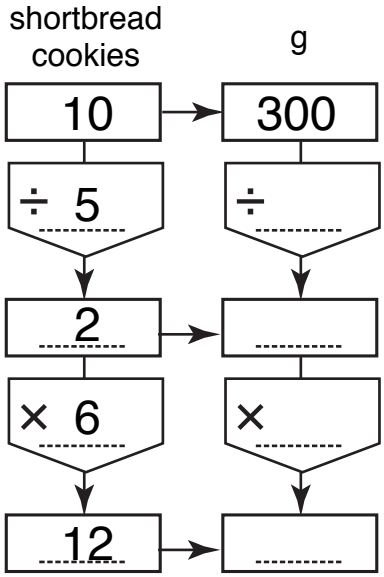
1 Here is a list of the ingredients for making **10** shortbread cookies.

300g Almond Flour
85g Butter
100g Sugar
5g Vanilla Extract

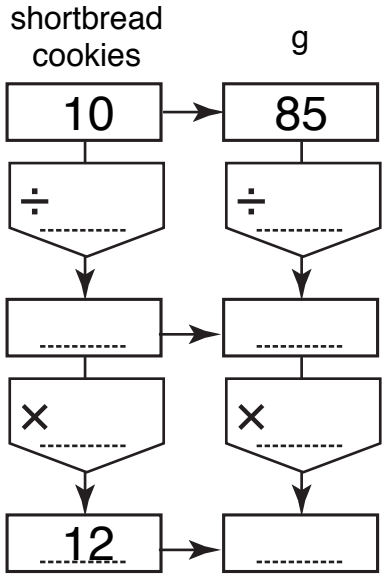
Dorothea wants to make **12** shortbread cookies.

Work out how much of each ingredient she needs.

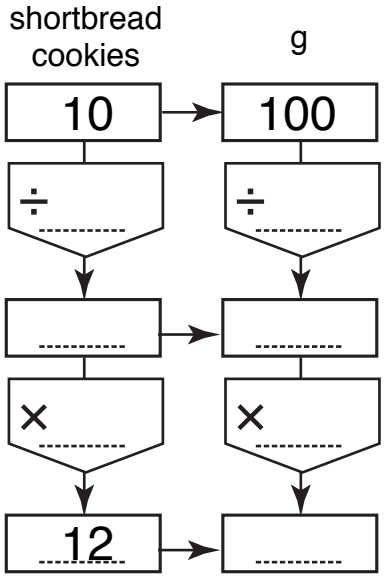
Almond Flour:



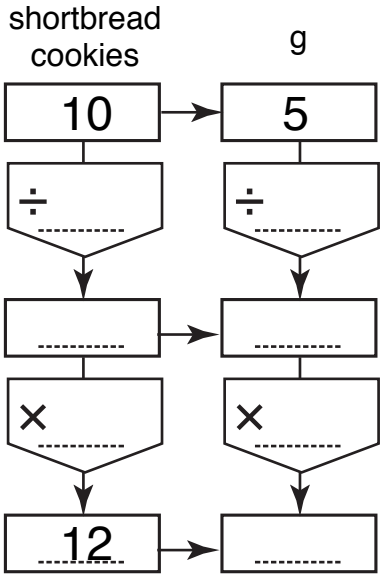
Butter:



Sugar:



Vanilla Extract:



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2.14 Proportion recipes next steps 2

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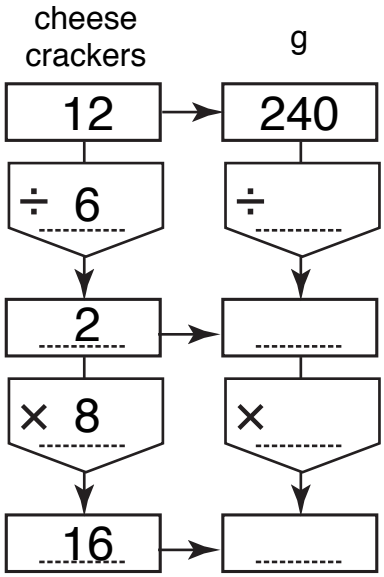
1 Here is a list of the ingredients for making **12** cheese crackers.

240g Cheddar Cheese
120g Flour
6g Salt
72g Butter

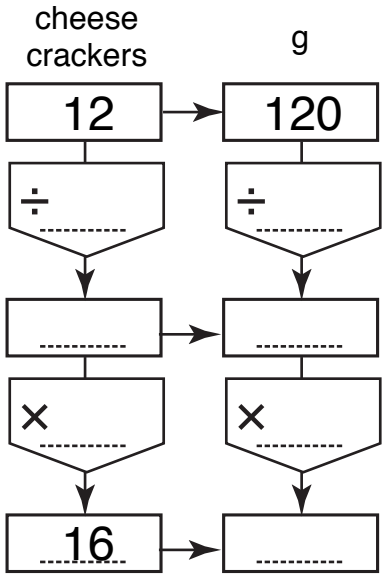
Matthew wants to make **16** cheese crackers.

Work out how much of each ingredient he needs.

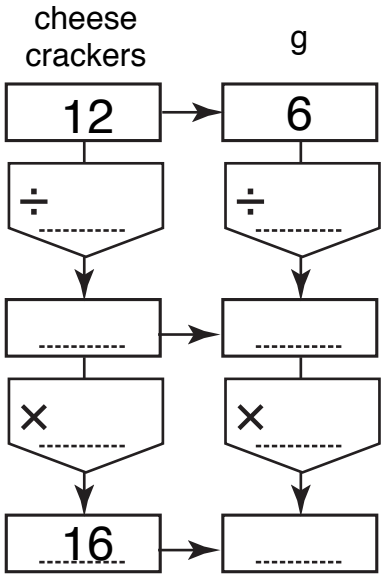
Cheddar Cheese:



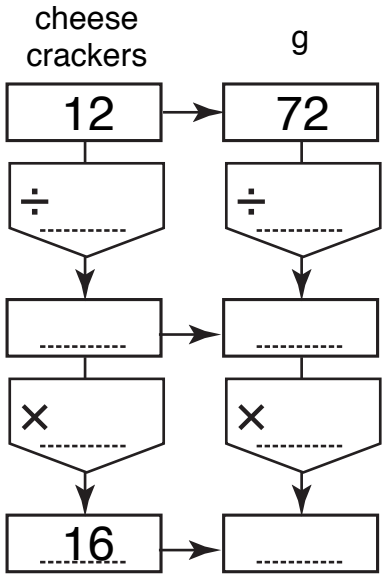
Flour:



Salt:



Butter:



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2.14 Proportion recipes next steps: Test

F/H

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1 Here is a list of the ingredients for making **16** pieces of peanut butter fudge.

120ml Maple Syrup
128g Peanut Butter
40g Coconut Oil
80g Dark Chocolate

Sam wants to make **18** pieces of peanut butter fudge.
Work out how much of each ingredient he needs.

Answer _____

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2.15 Proportion recipes extension 1

F/H

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1 Here is a list of the ingredients for making **3** servings of Macaroni Cheese.

200g	Macaroni Pasta
180ml	Milk
75g	Cheese
2	Shallots

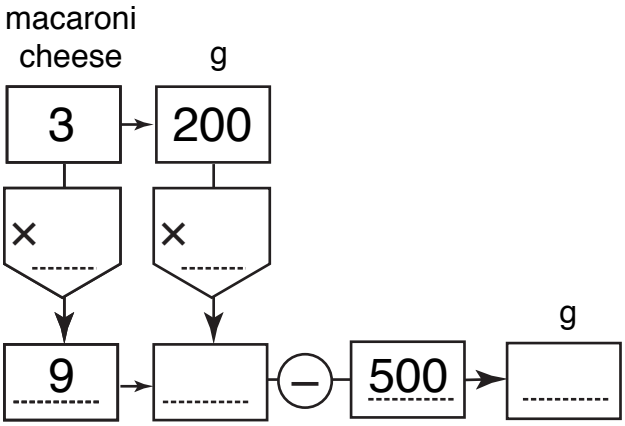
Daniel **has**: 500g Macaroni Pasta
450ml Milk
80g Cheese
5 Shallots

Daniel wants to make **9** servings of Macaroni Cheese.

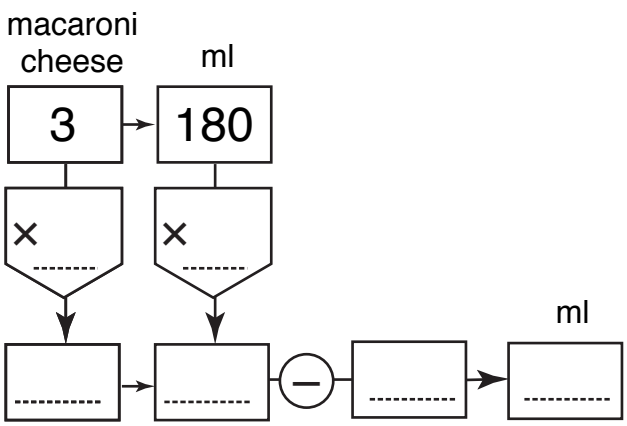
He **has not got** enough of all the ingredients.

Work out how much more of each ingredient he needs.

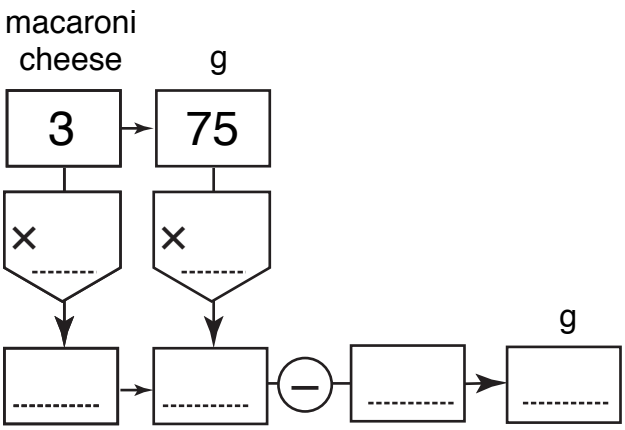
Macaroni Pasta:



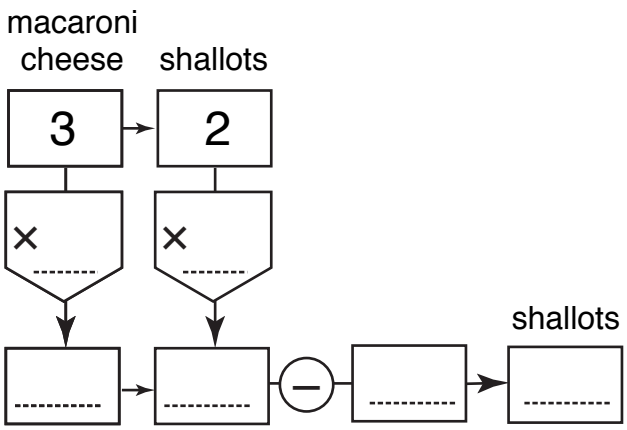
Milk:



Cheese:



Shallots:



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2.15 Proportion recipes extension 2

F/H

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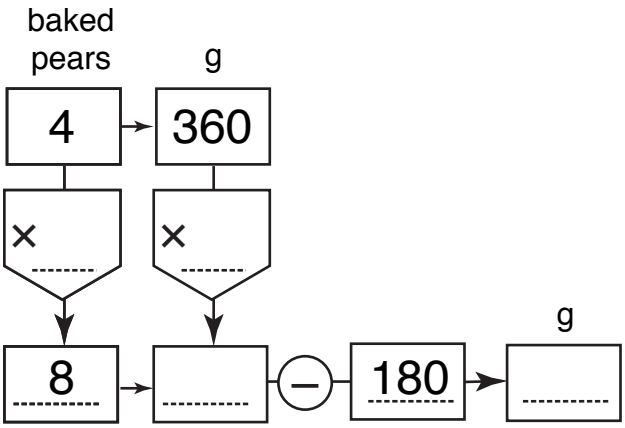
1 Here is a list of the ingredients for making **4** servings of Baked Pears.

360g Pears
120ml Maple Syrup
5g Vanilla Bean
150g Greek Yogurt

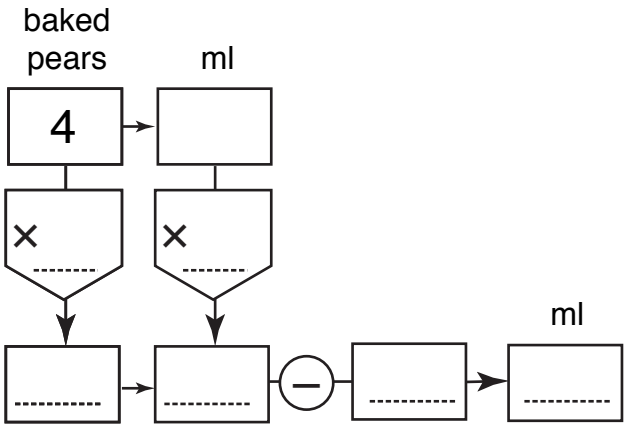
Peter **has**: 180g Pears
150ml Maple Syrup
5g Vanilla Bean
200g Greek Yogurt

Peter wants to make **8** servings of Baked Pears.
He **has not got** enough of all the ingredients.
Work out how much more of each ingredient he needs.

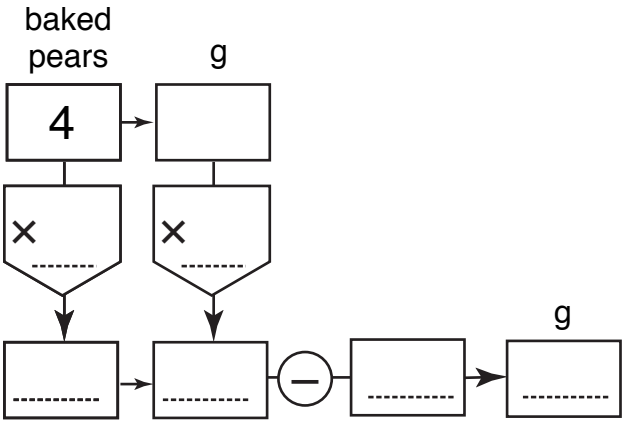
Pears:



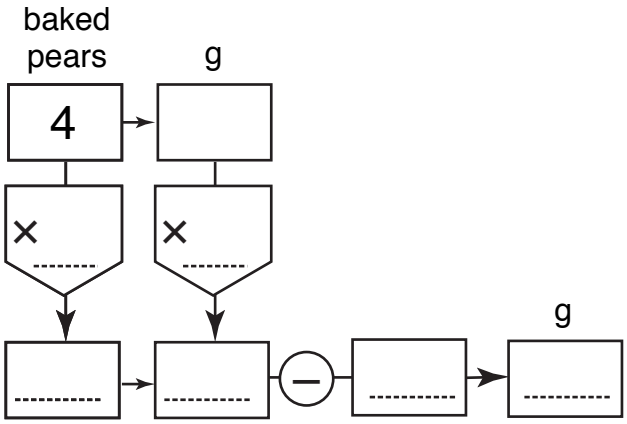
Maple Syrup:



Vanilla Bean:



Greek Yogurt:



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2.15 Proportion recipes extension: Test

F/H

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1 Here is a list of the ingredients for making **4** servings of Carrot & Swede Mash.

500g Carrots
600g Swede
25g Butter
50g Parsley

Christina **has**: 400g Carrots
300g Swede
20g Butter
50g Parsley

Christina wants to make **8** servings of Carrot & Swede Mash.
She **has not got enough** of all the ingredients.
Work out how much more of each ingredient he needs.

Answer _____ %

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3 Expressions

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3.1 Expressions introduction 1

F/H

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1 Jane and Sophie have some sweets.

Jane has x sweets.	**Sophie** has **twice as many** sweets as **Jane.**	
x	x	x
Jane	**Sophie**	

Write an **expression**, in terms of x, for the **total** number of sweets that Jane and Sophie have.

Answer _____

2 Amy and Kate have some sweets.

Amy has x sweets.	**Kate** has **three times as many** sweets as **Amy.**		
x	x	x	x
Amy	**Kate**		

Write an **expression**, in terms of x, for the **total** number of sweets that Amy and Kate have.

Answer _____

3 Jay and Kelly have some sweets.

Jay has x sweets	**Kelly** has **three more** sweets than **Jay**	
x	x	$+3$
Jay	**Kelly**	

Write an **expression**, in terms of x, for the **total** number of sweets that Jay and Kelly have.

Answer _____

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3.1 Expressions introduction 2

F/H

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1 James and Peter have some sweets.

James has x sweets	**Peter** has **3** sweets **fewer** than **James**	
x	x	-3
James	**Peter**	

Write an **expression**, in terms of x, for the **total** number of sweets that James and Peter have.

Answer _____

2a Sarah and Kim have some sweets. Complete the diagram.

Sarah has x sweets	**Kim** has **4** sweets **fewer** than **Sarah**	
x	x	.....
Sarah	**Kim**	

2b Write an **expression**, in terms of x, for the **total** number of sweets that Sarah and Kim have.

Answer _____

3a Tom and Billy have some sweets. Complete the diagram.

Tom has x sweets	**Billy** has **4 more** sweets than **Tom**	
x	x	.....
Tom	**Billy**	

2b Write an **expression**, in terms of x, for the **total** number of sweets that Tom and Billy have.

Answer _____

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3.1 Expressions introduction: Test

F/H

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1 Sue has x sweets.
Ann has **twice** as many sweets as **Sue**.
Write an **expression**, in terms of x, for the **total** number of sweets that Sue and Ann have.

Answer _____

2 John has x sweets.
Peter has **3 more** sweets than **John**.
Write an **expression**, in terms of x, for the **total** number of sweets that John and Peter have.

Answer _____

3 Mark has x sweets.
Chris has **5 fewer** sweets than **Mark**.
Write an **expression**, in terms of x, for the **total** number of sweets that Mark and Chris have.

Answer _____

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3.2 Expressions next steps 1

F/H

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1 Katie, Grace and Chris have some sweets.

Katie has x sweets.	Grace has **twice as many** sweets as Katie.		Chris has **3 more** sweets than Katie.	
x	x	x	x	$+3$
Katie	**Grace**		**Chris**	

Write an **expression**, in terms of x, for the **total** number of sweets that Katie, Grace, and Chris have.

Answer _____

2 Kim, Jane and Mark have some sweets.

Kim has x sweets.	Jane has **3 times as many** sweets as Kim.			Mark has **2 more** sweets than Kim.	
x	x	x	x	x	$+2$
Kim	**Jane**			**Mark**	

Write an **expression**, in terms of x, for the **total** number of sweets that Kim, Jane, and Mark have.

Answer _____

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3.2 Expressions next steps 2

F/H

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1a Sylvia, Paul and Tim have some sweets.
Complete the diagram.

Sylvia has x sweets.	Paul has **twice as many** sweets as Sylvia.		Tim has **4 more** sweets than Sylvia.	
x	x	x	x	.....
Sylvia	**Paul**		**Tim**	

1b Write an **expression**, in terms of x, for the **total** number of sweets that Sylvia, Paul, and Tim have.

Answer _____

2a John, Luke and Emily have some sweets.
Complete the diagram.

John has x sweets.	Luke has **twice as many** sweets as John.		Emily has **2 more** sweets than John.	
x	.....	.....	.....	.....
John	**Luke**		**Emily**	

2b Write an **expression**, in terms of x, for the **total** number of sweets that John, Luke, and Emily have.

Answer _____

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3.2 Expressions next steps: Test

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1 **Adam** has x sweets.
John has **three times** as many sweets as **Adam**.
David has **2 more** sweets than **Adam**.

Write an **expression**, in terms of x , for the **total** number of sweets that Adam, John and David have.

Answer _____

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3.3 Expressions advanced 1

F/H

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1 John, Luke and Emily have some sweets.

John has x sweets.	Luke has **twice as many** sweets as John.		Emily has **2 more** sweets than **Luke**.		
x	x	x	x	x	$+ 2$
John	**Luke**		**Emily**		

Write an **expression**, in terms of x, for the **total** number of sweets that John, Luke, and Emily have.

Answer _____

2a Tim, Sophie and Lorna have some sweets.
Complete the diagram.

Tim has x sweets.	Sophie has **twice as many** sweets as Tim.		Lorna has **4 more** sweets than **Sophie.**		
x	.....	.....	.....	.....	+ .....
Tim	**Sophie**		**Lorna**		

2b Write an **expression**, in terms of x, for the **total** number of sweets that Tim, Sophie, and Lorna have.

Answer _____

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3.3 Expressions advanced 2

F/H

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1 Tom, Andy and Kyle have some sweets.

Tom has x sweets.	Andy has **twice as many** sweets as Tom.		Kyle has **3 fewer** sweets than **Andy.**		
x	x	x	x	x	-3
Tom	**Andy**		**Kyle**		

Write an **expression**, in terms of x, for the **total** number of sweets that Tom, Andy, and Kyle have.

Answer _____

2a Bob, John and Sue have some sweets.
Complete the diagram.

Bob has x sweets.	John has **3 times as many** sweets as Bob.			Sue has **4 fewer** sweets than **John.**			
x	.....	.....	.....	.....	.....	.....	-4
Bob	**John**			**Sue**			

2b Write an **expression**, in terms of x, for the **total** number of sweets that Bob, John, and Sue have.

Answer _____

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3.3 Expressions advanced: Test

F/H

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1 **Andrew** has x sweets.
John has **three times** as many sweets as **Andrew**.
Damien has **4 more** sweets than **John**.

Write an **expression**, in terms of x , for the **total** number of sweets that Andrew, John and Damien have.

Answer _____

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3.4 Expressions exchanging introduction 1

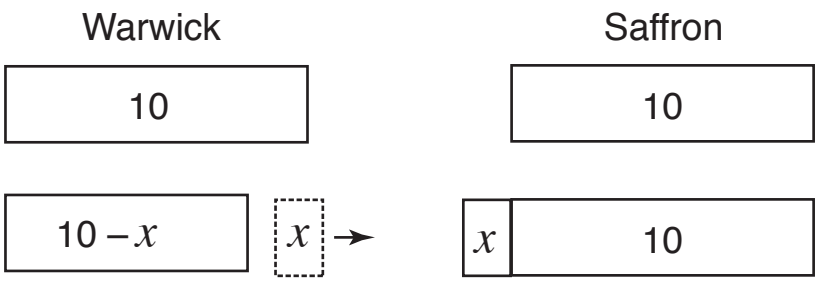
F/H

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Example

Warwick has **10** sweets.
Saffron has **10** sweets.

Warwick **gives** Saffron x sweets.



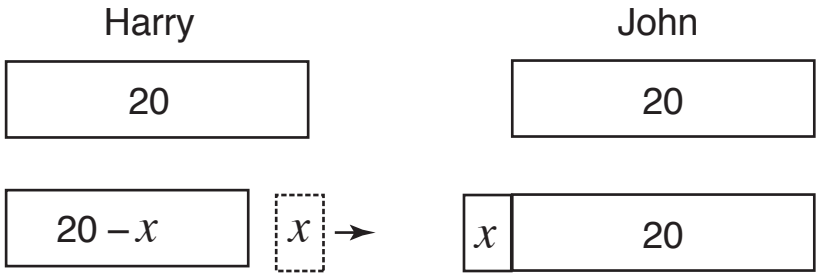
Here are **expressions** for the number of sweets each person **now** has:

Warwick: $10 - x$

Saffron: $x + 10$

1 Harry has **20** sweets.
John has **20** sweets.

Harry **gives** John x sweets.

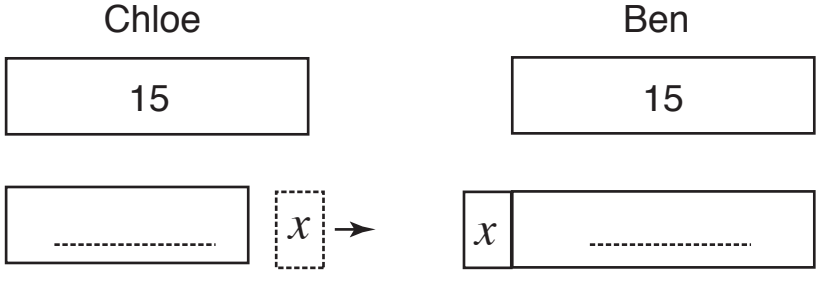


Write **expressions** for the number of sweets each person **now** has:

Harry _____ John _____

2 Chloe has **15** sweets.
Ben has **15** sweets.

2a Chloe **gives** Ben x sweets.
Complete the diagram:



2b Write **expressions** for the number of sweets each person **now** has:

Chloe _____ Ben _____

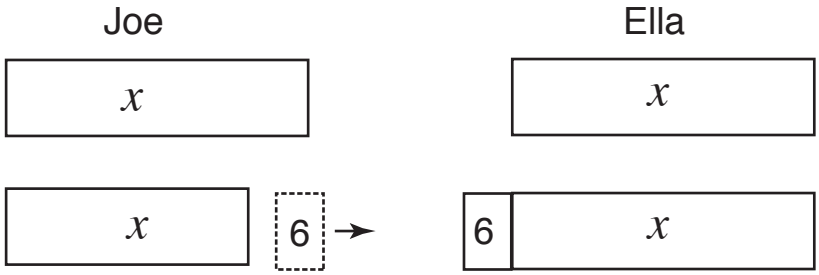
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3.4 Expressions exchanging introduction 2

F/H

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1 Joe has x sweets.
Ella has x sweets.



Joe **gives** Ella 6 sweets.

Write **expressions** for the number of sweets each person **now** has:

Joe _____ Ella _____

2 Brandon has x sweets.
Emily has x sweets.



2a Brandon **gives** Emily 5 sweets.
Complete the diagram:



2b Write **expressions** for the number of sweets each person **now** has:

Brandon _____ Emily _____

3 Jordan has x sweets.
Phoebe has x sweets.



3a Jordan **gives** Phoebe 3 sweets.
Complete the diagram:



3b Write **expressions** for the number of sweets each person **now** has:

Jordan _____ Phoebe _____

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3.4 Expressions exchanging introduction: Test

F/H

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1 Mark has 18 sweets.
Jon has also has 18 sweets.
Mark gives Jon x sweets.
Write expressions for the number of sweets Mark and Jon now have.

Answers Mark _____ Jon _____

2 Paul has 20 sweets.
Tony has also has 20 sweets.
Paul gives Tony x sweets.
Write expressions for the number of sweets Paul and Tony now have.

Answers Mark _____ Jon _____

3 Amy has x sweets.
Brandon has also has x sweets.
Amy gives Brandon 4 sweets.
Write expressions for the number of sweets Amy and Brandon now have.

Answers Amy _____ Brandon _____

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3.5 Expressions exchanging advanced 1

F/H

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Example

Damien has **20** sweets.
Jenni has **20** sweets.



Damien **gives** Jenni x sweets.



Damien **eats 5** of his sweets.



Here are **expressions** for the number of sweets each person **now** has:

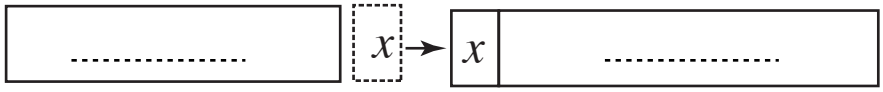
Damien: $15 - x$

Jenni: $x + 20$

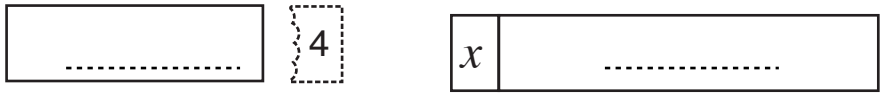
1 Mark has **25** sweets.
John has **25** sweets.



1a Mark **gives** Jon x sweets.
Complete the diagram:



Mark **eats 4** of his sweets.
Complete the diagram:



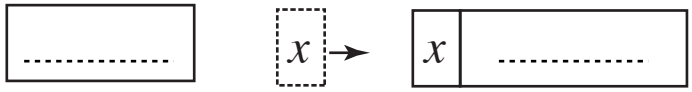
1b Write **expressions** for the number of sweets each person **now** has:

Mark _____ John _____

2 Tim has **15** sweets.
Bill has **15** sweets.



2a Tim **gives** Bill x sweets.
Complete the diagram:



Tim **eats 3** of his sweets.
Complete the diagram:



2b Write **expressions** for the number of sweets each person **now** has:

Tim _____ Bill _____

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3.5 Expressions exchanging advanced 2

F/H

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1 Mary has **15 sweets**.
Jane has **20 sweets**.
Mary gives Jane x sweets.

1 a Write **expressions** for the number of sweets Mary and Jane now have.

Mary _____ Jane _____

1 b Mary then eats **8** of her **sweets**.
Write an **expression** for the number of sweets Mary now has.

Mary _____

2 Joe has **23 sweets**.
Saffron has **23 sweets**.
Joe gives Saffron x sweets.

2 a Write **expressions** for the number of sweets Joe and Saffron now have.

Joe _____ Saffron _____

2 b Joe then eats **8** of his **sweets**.
Write an **expression** for the number of sweets Joe now has.

Joe _____

3 Andrew has **18 sweets**.
Warwick has **24 sweets**.
Andrew gives Warwick x sweets.

3 a Write **expressions** for the number of sweets Andrew and Warwick now have.

Andrew _____ Warwick _____

3 b Warwick then eats **2** of his **sweets**.
Write an **expression** for the number of sweets Warwick now has.

Warwick _____

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3.5 Expressions exchanging advanced : test

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1 Mark has 18 sweets.
Jon has also has 18 sweets.

Mark gives Jon x sweets.

Mark then eats 4 of his sweets.

Write expressions for the number of sweets Mark and Jon now have.

Answer _____

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3.6 Expressions & the mean introduction 1

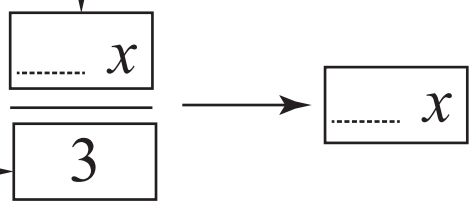
F/H

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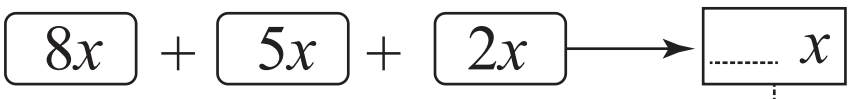
1a These expressions represent **three** numbers
Work out the **total** in terms of x



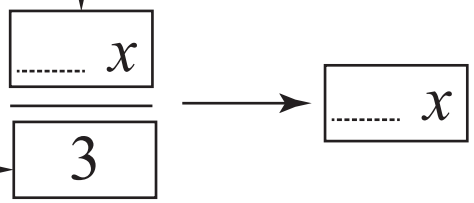
1b Work out the mean of the **3** numbers in terms of x



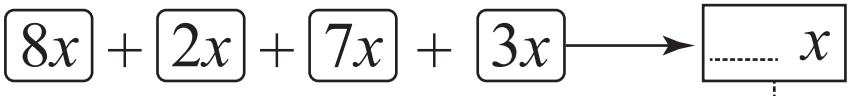
2a These expressions represent **three** numbers
Work out the **total** in terms of x



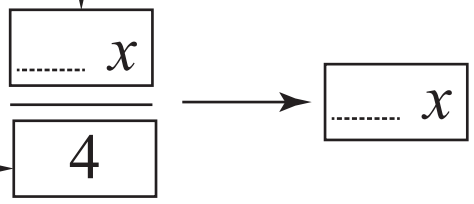
2b Work out the mean of the **3** numbers in terms of x



3a These expressions represent **four** numbers
Work out the **total** in terms of x



3b Work out the mean of the **4** numbers in terms of x



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3.6 Expressions & the mean introduction 2

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1a These expressions represent **four** numbers
Work out the **total** in terms of x

$8x + 2x + 10x + 4x \rightarrow$ x

1b Work out the mean of the **4** numbers in terms of x

..... x ÷ ☐ → x

2a These expressions represent **five** numbers
Work out the **total** in terms of x

$x + 2x + 3x + 4x + 10x \rightarrow$ x

2b Work out the mean of the **5** numbers in terms of x

..... x ÷ ☐ → x

3a These expressions represent **five** numbers
Work out the **total** in terms of x

$x + 20x + 4x + 5x + 10x \rightarrow$ x

3b Work out the mean of the **5** numbers in terms of x

..... x ÷ ☐ → x

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3.6 Expressions & the mean introduction: test

F/H

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1 These expressions represent **three** numbers.

x $2x$ $3x$

Work out the mean in terms of x

Answer _____

2 These expressions represent **five** numbers.

x $6x$ $4x$ $9x$ $10x$

Work out the mean in terms of x

Answer _____

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3.7 Expressions & the mean advanced 1

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1a These expressions represent **three** numbers
Work out the **total** in terms of x

x + $2x + 6$ + $9x$ → $\square x + \square$

1b Work out the mean of the **3** numbers in terms of x

$\square x + \square$ ÷ $\square$ → $\square x + \square$

2a These expressions represent **three** numbers
Work out the **total** in terms of x

$7x$ + $2x + 3$ + $9x$ → $\square x + \square$

2b Work out the mean of the **3** numbers in terms of x

$\square x + \square$ ÷ $\square$ → $\square x + \square$

3a These expressions represent **four** numbers
Work out the **total** in terms of x

$9x$ + $8x$ + $5x + 8$ + $2x$ → $\square x + \square$

3b Work out the mean of the **4** numbers in terms of x

$\square x + \square$ ÷ $\square$ → $\square x + \square$

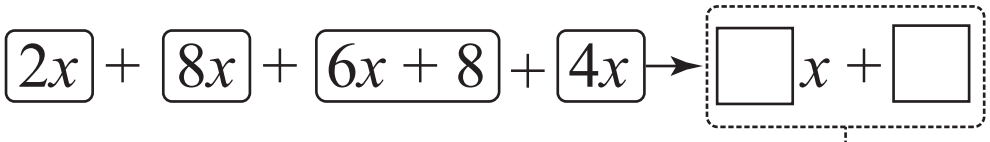
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3.7 Expressions & the mean advanced 2

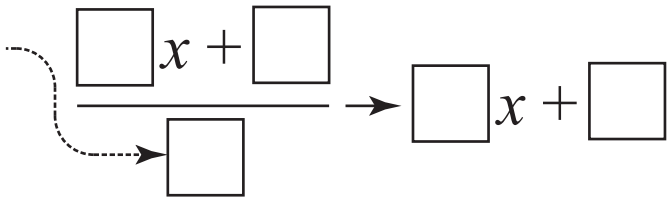
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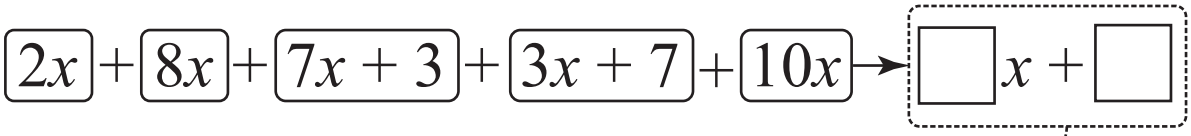
1a These expressions represent **four** numbers
Work out the **total** in terms of x



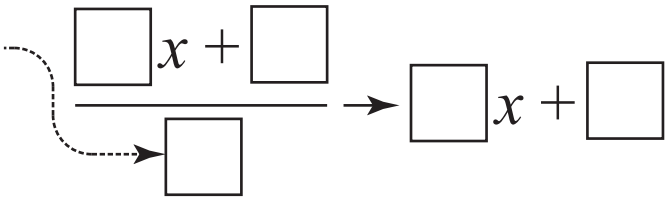
1b Work out the mean of the **4** numbers
in terms of x



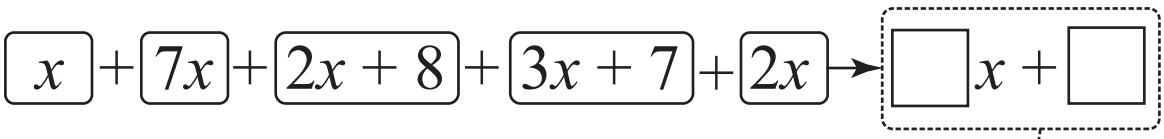
2a These expressions represent **five** numbers
Work out the **total** in terms of x



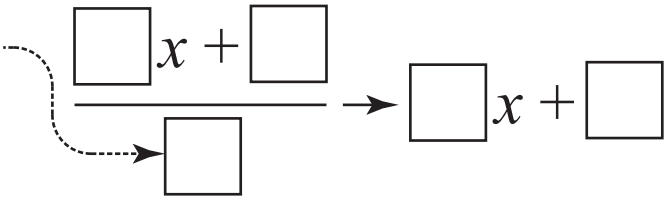
2b Work out the mean of the **5** numbers
in terms of x



3a These expressions represent **five** numbers
Work out the **total** in in terms of x



3b Work out the mean of the **5** numbers
in terms of x



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3.7 Expressions & the mean advanced: test

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1 These expressions represent **three** numbers.

x $2x + 9$ $3x$

Work out the mean in terms of x

Answer _____

2 These expressions represent **four** numbers.

x $6x + 8$ $4x + 12$ $13x$

Work out the mean in terms of x

Answer _____

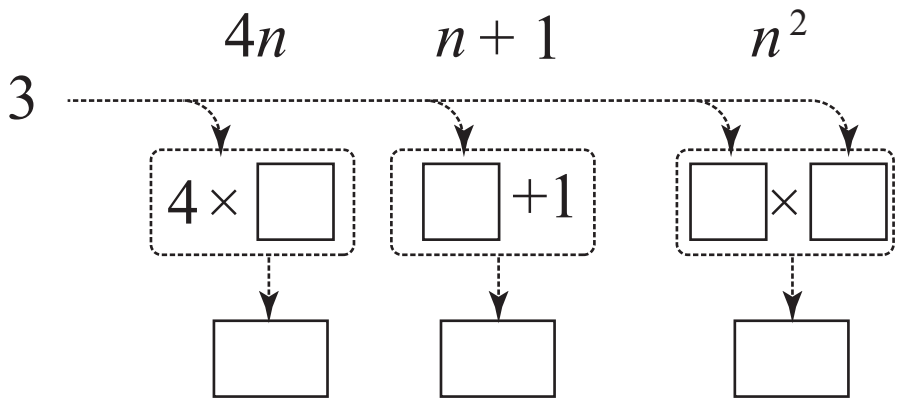
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3.8 Expressions & the median introduction 1

F/H

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1a Calculate the value of each expression when $n = 3$

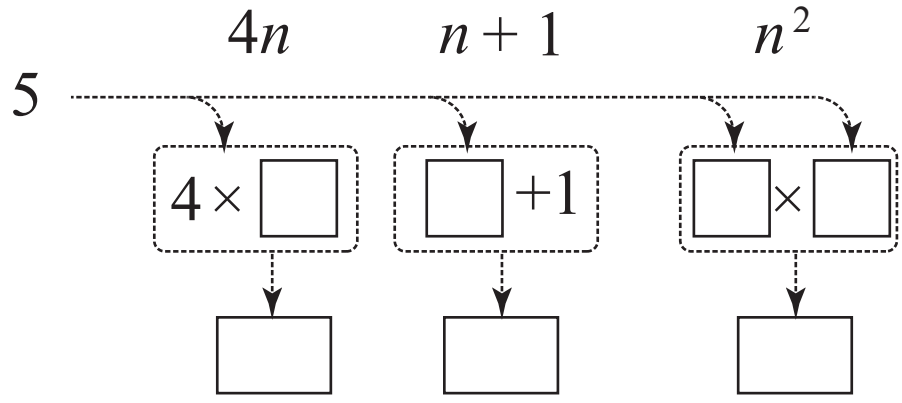


1b Write your answers in order, smallest to largest.

Smallest	Median	Largest

1c Write down the expression that gave the median value. Answer _____

2a Calculate the value of each expression when $n = 5$



2b Write your answers in order, smallest to largest.

Smallest	Median	Largest

2c Write down the expression that gave the median value. Answer _____

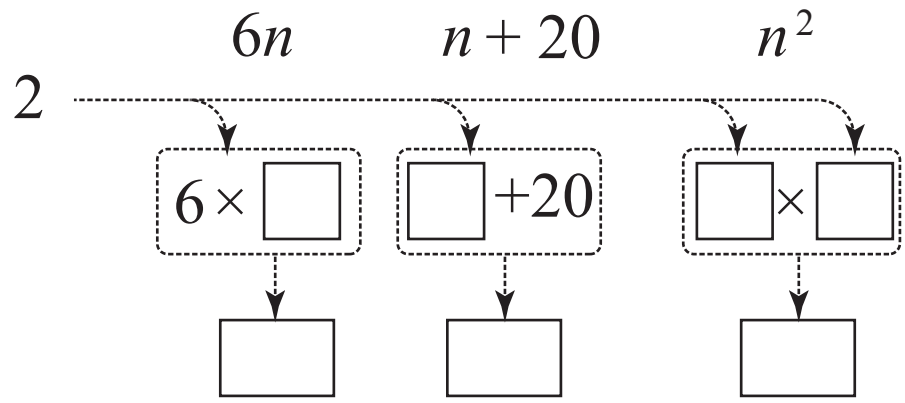
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3.8 Expressions & the median introduction 2

F/H

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1a Calculate the value of each expression when $n = 2$

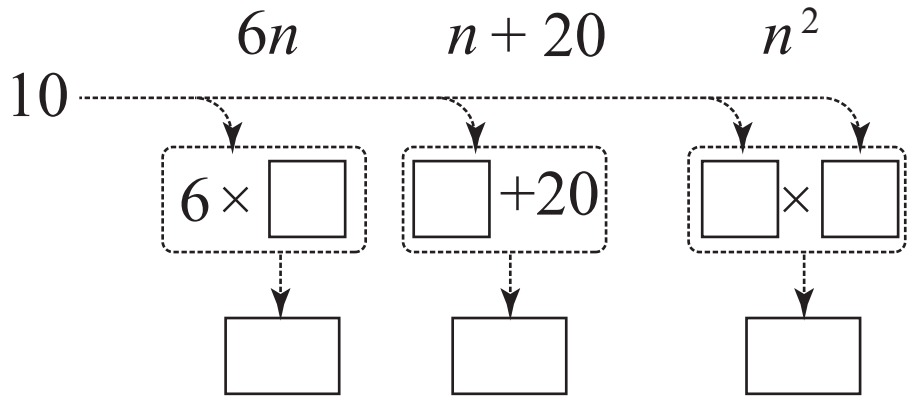


1b Write your answers in order, smallest to largest.

Smallest ☐ Median ☐ Largest ☐

1c Write down the expression that gave the median value. Answer _____

2a Calculate the value of each expression when $n = 10$



2b Write your answers in order, smallest to largest.

Smallest ☐ Median ☐ Largest ☐

2c Write down the expression that gave the median value. Answer _____

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3.8 Expressions & the median introduction: Test

F/H

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1 Here are some expressions

$5n$ $n + 6$ n^2

Which of these expressions will give the median value when $n = 4$

Answer _____

2 Here are some expressions

$4n$ $n + 10$ n^2

Which of these expressions will give the median value when $n = 2$

Answer _____

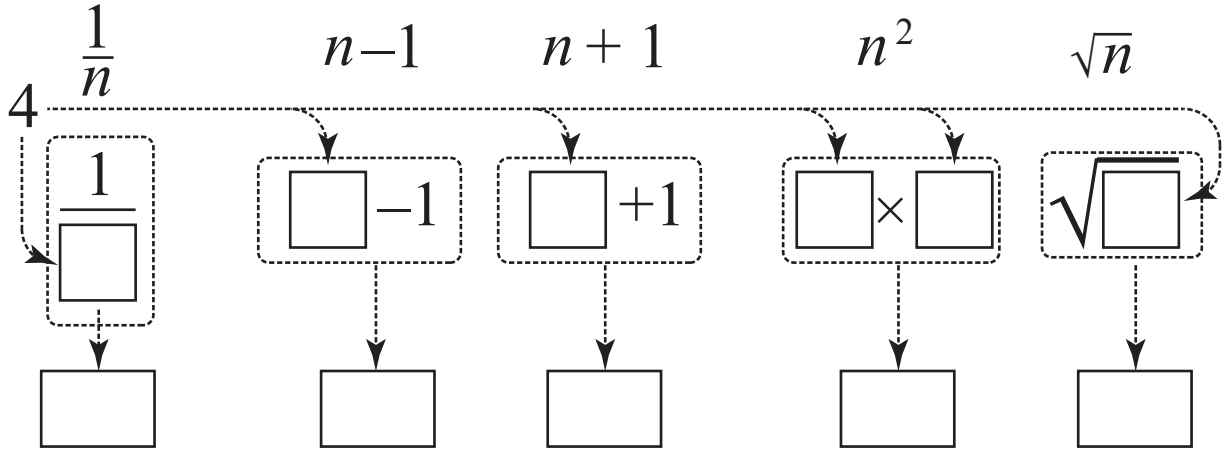
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3.9 Expressions & the median advanced 1

F/H

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1a Calculate the value of each expression when $n = 4$

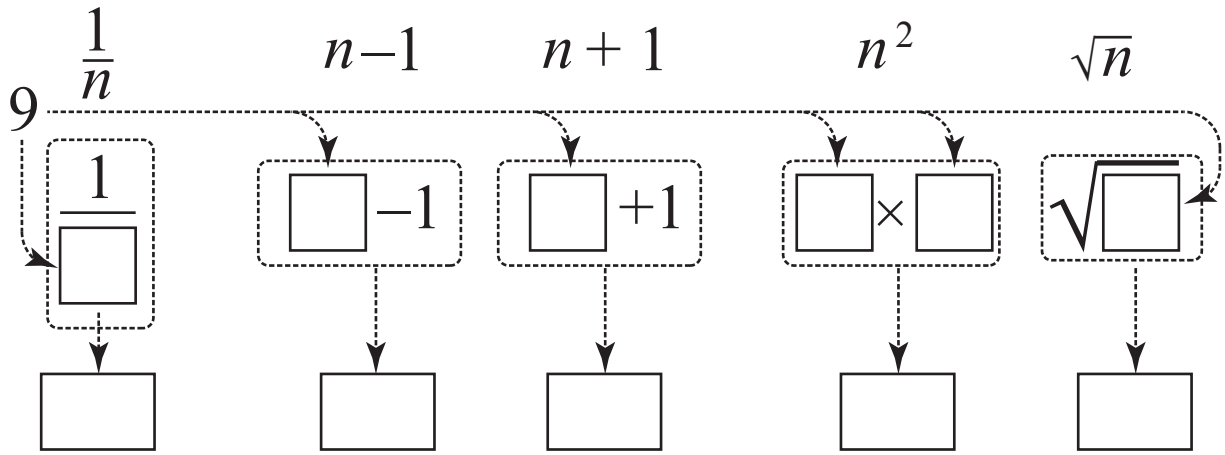


1b Write your answers in order, smallest to largest.

Smallest ☐ ☐ Median ☐ ☐ Largest

1c Write down the expression that gave the median value. Answer _____

2a Calculate the value of each expression when $n = 9$



2b Write your answers in order, smallest to largest.

Smallest ☐ ☐ Median ☐ ☐ Largest

2c Write down the expression that gave the median value. Answer _____

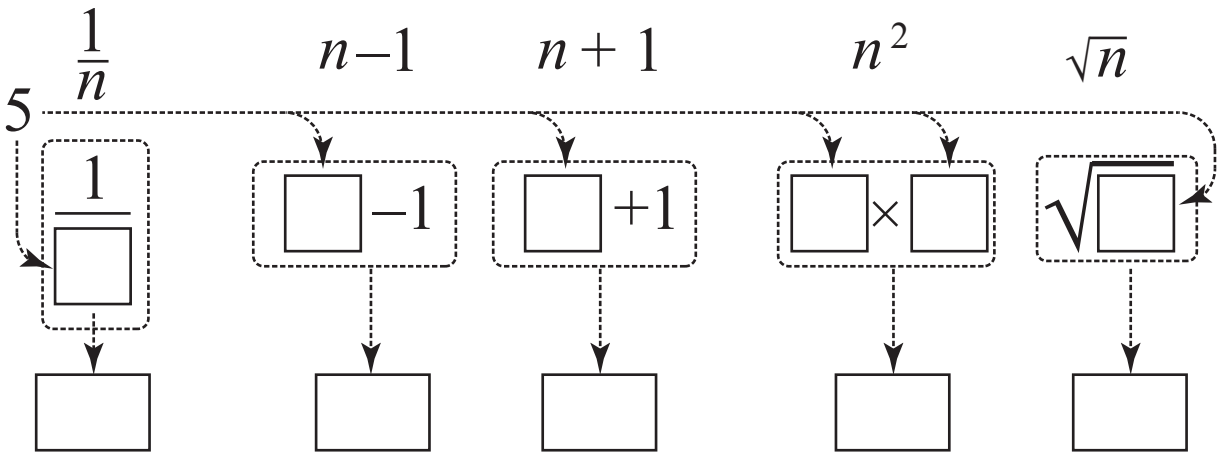
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3.9 Expressions & the median advanced 2

F/H

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1a Calculate the value of each expression when $n = 5$

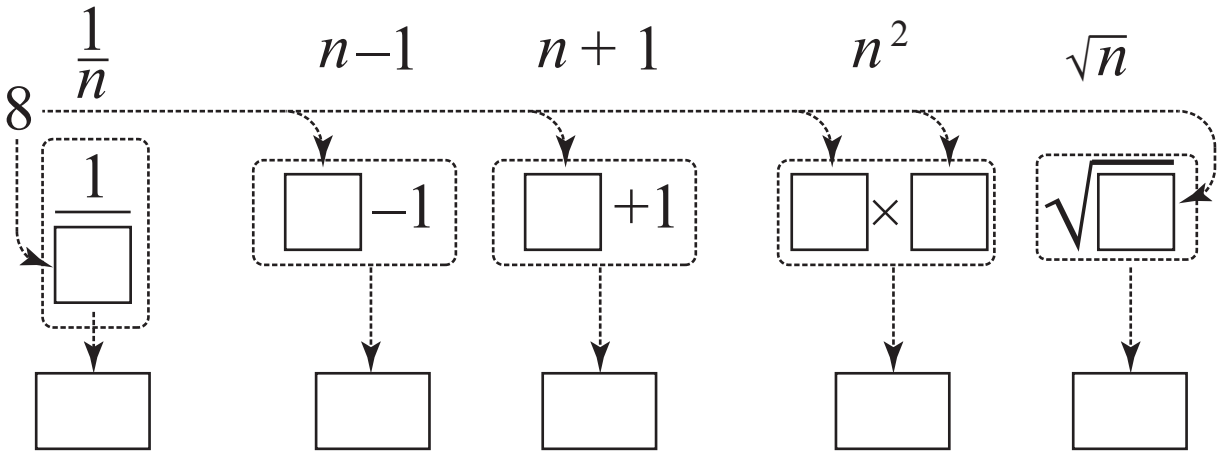


1b Write your answers in order, smallest to largest.

Smallest Median Largest

1c Write down the expression that gave the median value. Answer _____

2a Calculate the value of each expression when $n = 8$



2b Write your answers in order, smallest to largest.

Smallest Median Largest

2c Write down the expression that gave the median value. Answer _____

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3.9 Expressions & the median advanced: Test

F/H

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1 Here are some expressions

$$\frac{1}{n} \qquad n-1 \qquad n+1 \qquad n^2 \qquad \sqrt{n}$$

Which of these expressions will give the median value when $n = 12$

Answer _____

2 Here are some expressions

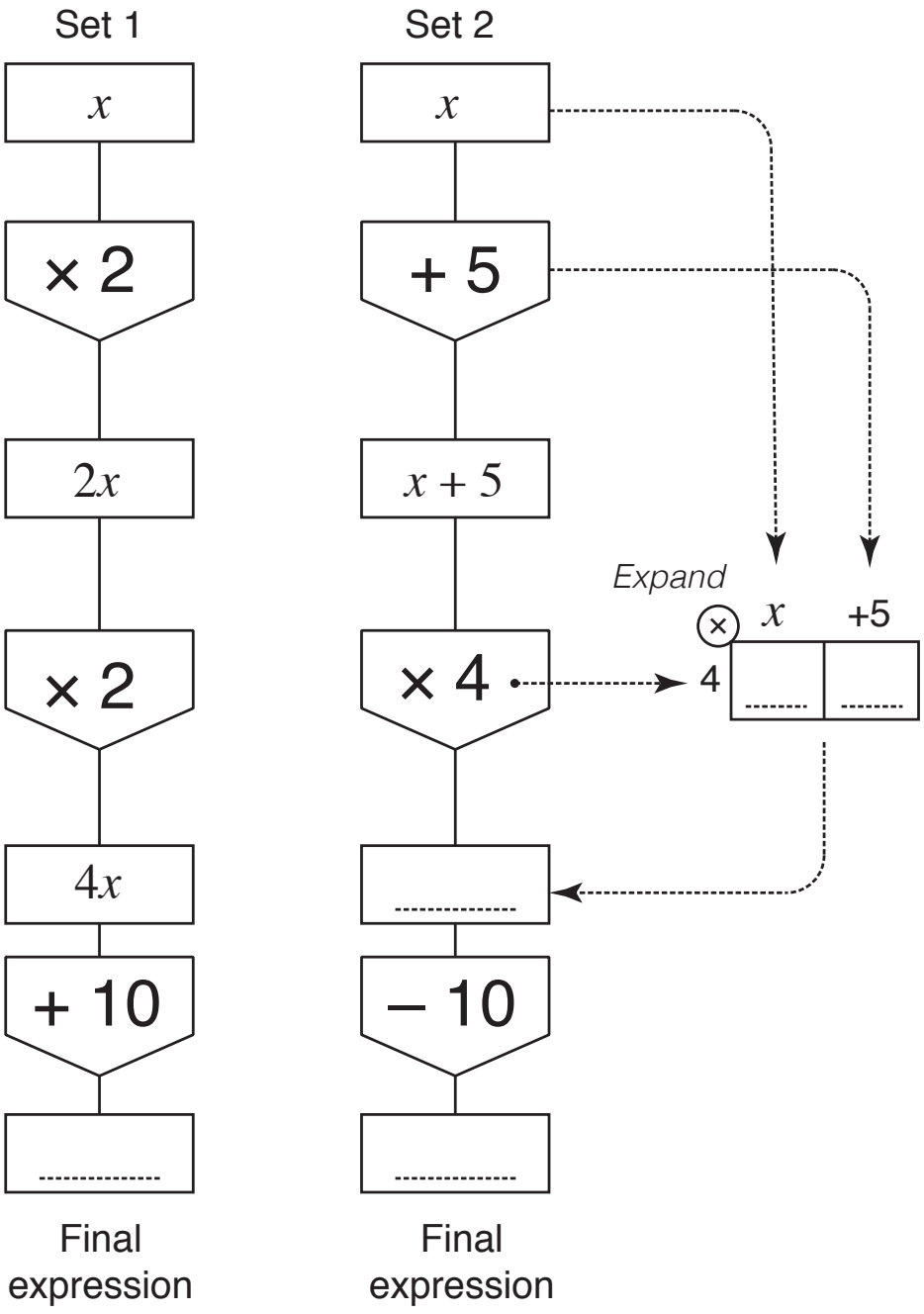
$$\frac{1}{n} \qquad n-1 \qquad n+1 \qquad n^2 \qquad \sqrt{n}$$

Which of these expressions will give the median value when $n = 7$

Answer _____

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1a Here are two sets of instructions.



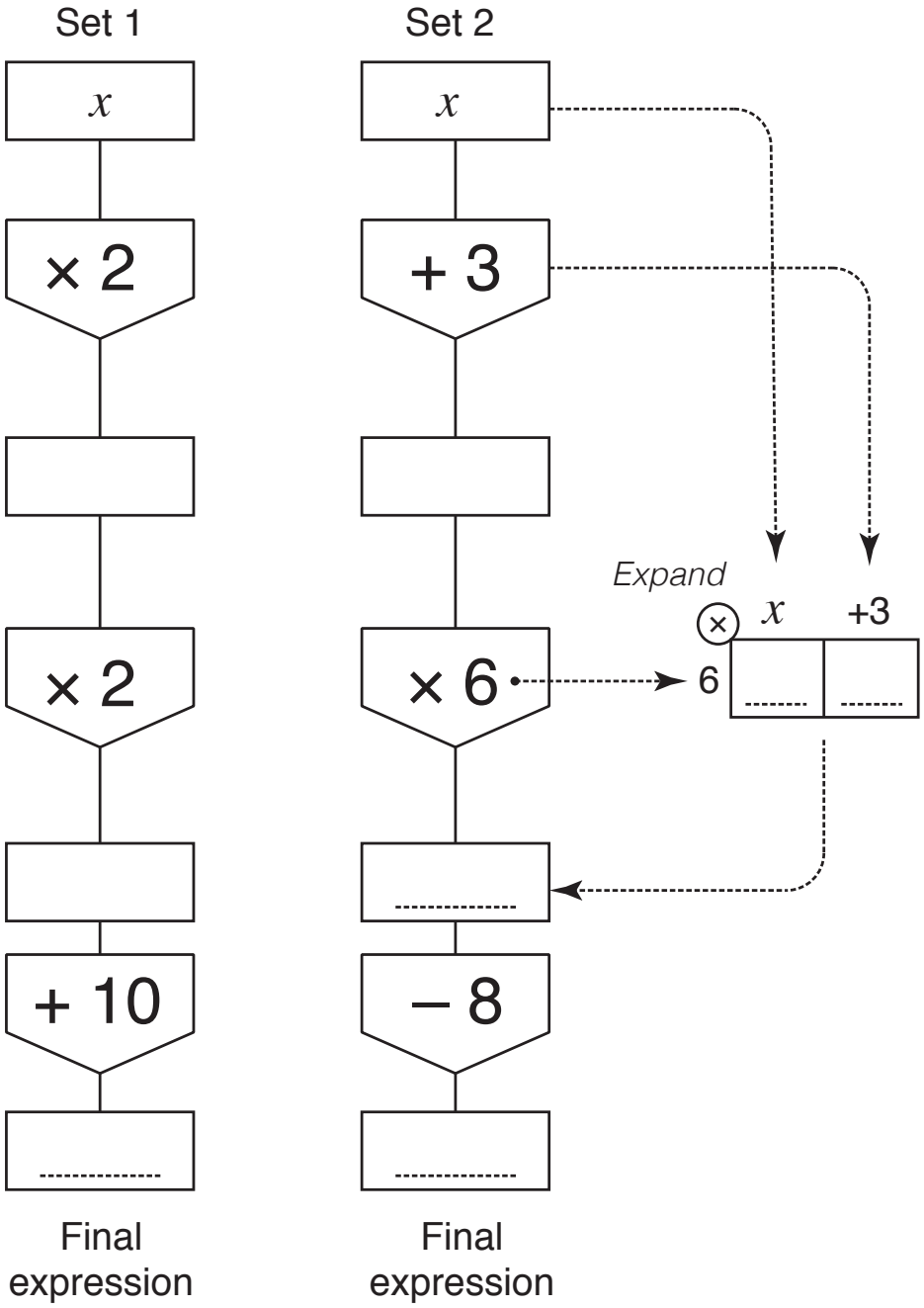
1b Are the final expressions the same or different?
Tick a box.

☐ The same

☐ Different

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1a Here are two sets of instructions.



1b Are the final expressions the same or different?
Tick a box.

☐ The same

☐ Different

© Toticity Limited

1 Here are two sets of instructions

First set	
Instruction	Expression
Start with x	
Double it	
Double it again	
Add 5	
Outcome	

Second set	
Instruction	Expression
Start with x	
Add 3	
Multiply by 4	
Subtract 7	
Outcome	

Complete the tables to show that both sets of instructions give the same outcome.

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4 Equations

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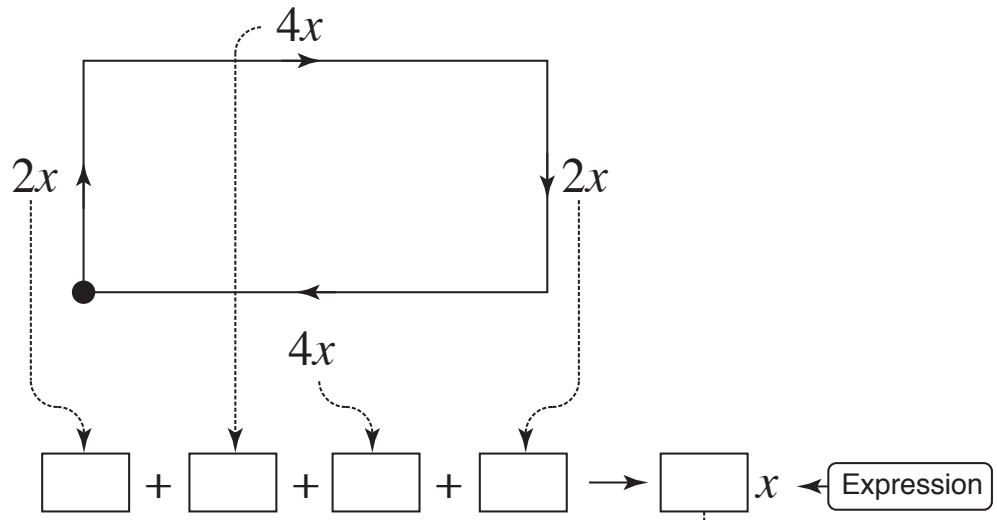
4.1 Equations and perimeter of a rectangle introduction 1

F/H

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1 The diagram shows a **rectangle**.

1 a Write an expression for the perimeter of the rectangle.



1 b The **perimeter** of the rectangle is **36 cm**.

Calculate the value of x



Answer _____

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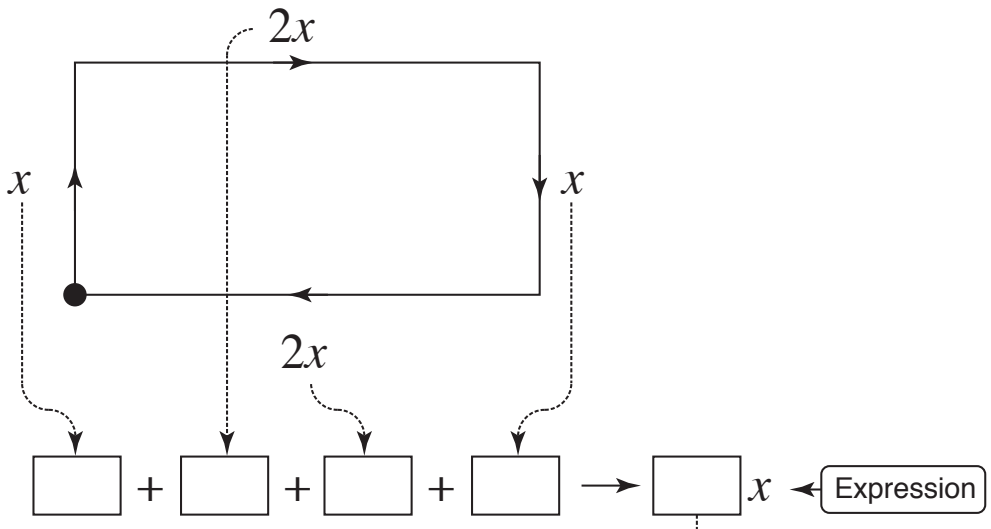
4.1 Equations and perimeter of a rectangle introduction 2

F/H

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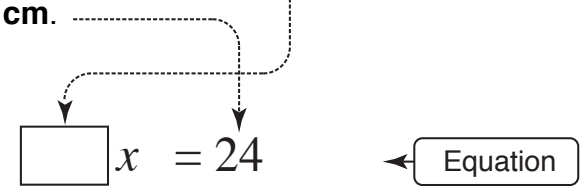
1 The diagram shows a **rectangle**.

1 a Write an expression for the perimeter of the rectangle.



1 b The **perimeter** of the rectangle is **24 cm**.

Calculate the value of x



Answer _____

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4.1 Equations and perimeter of a rectangle introduction: Test

F/H

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1 The diagram shows a rectangle.

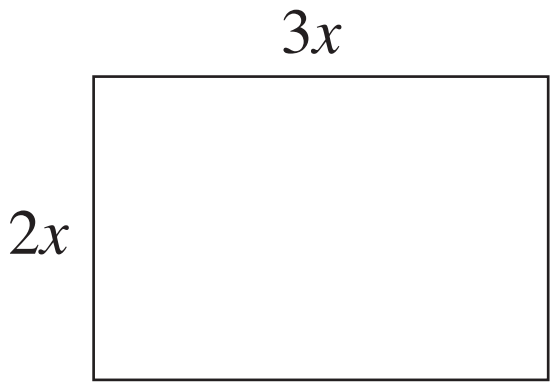


Diagram not to scale.

The perimeter of the rectangle is 40 cm.
Calculate the value of x.

Answer _____

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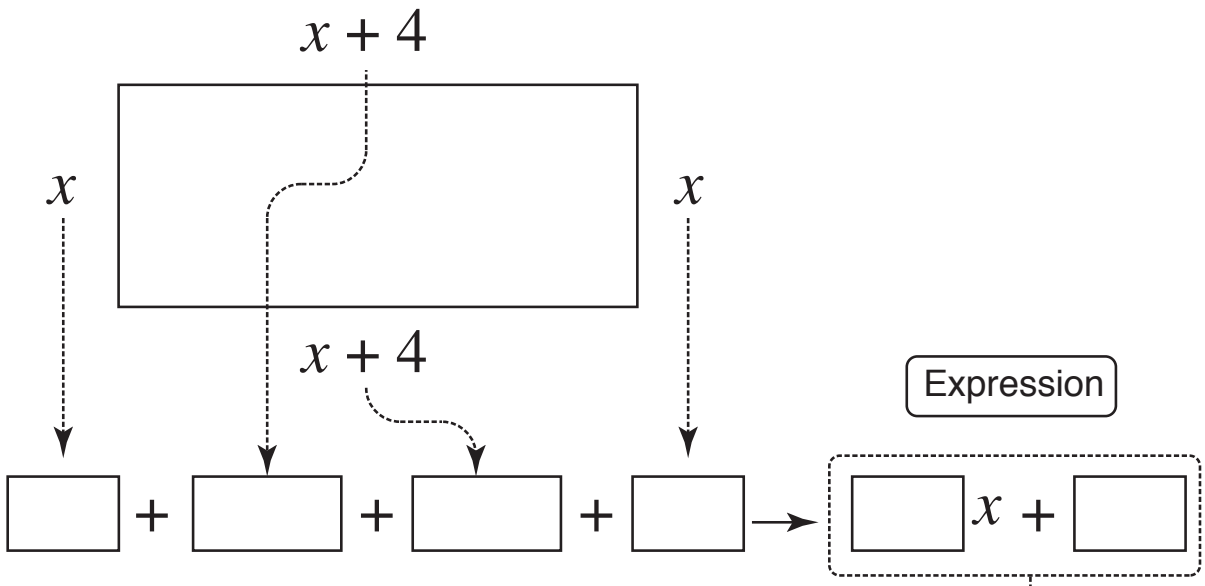
4.2 Equations and perimeter of a rectangle next steps 1

F/H

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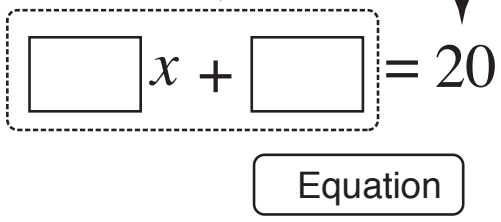
1 The diagram shows a rectangle.

1 a Write an expression for the **perimeter** of the rectangle.



1 b The **perimeter** of the rectangle is **20 cm**.

Calculate the value of x



Answer _____

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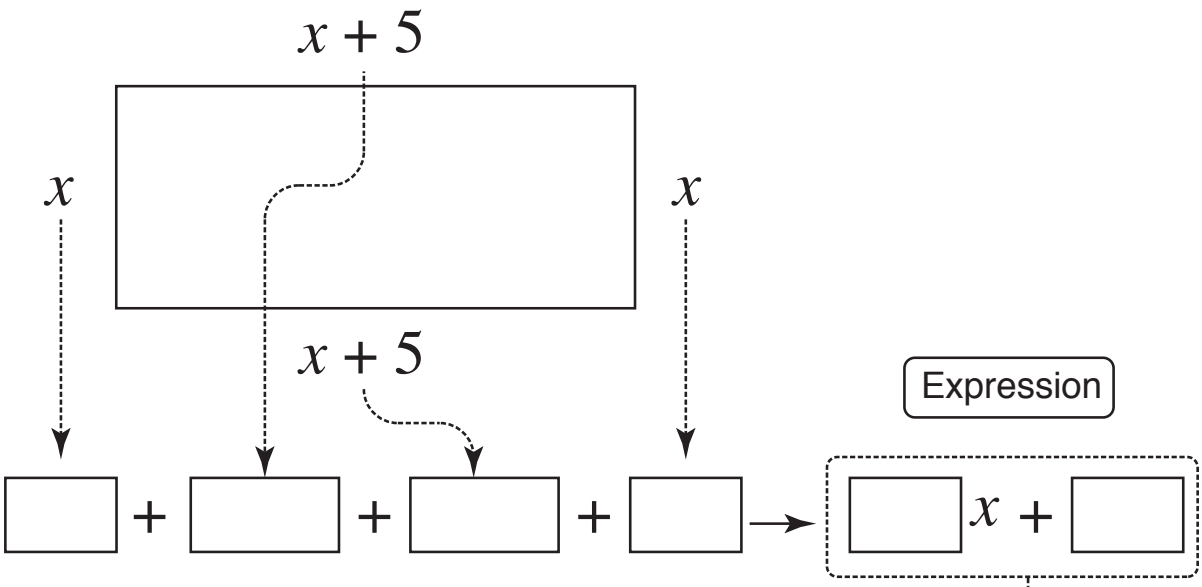
4.2 Equations and perimeter of a rectangle next steps 2

F/H

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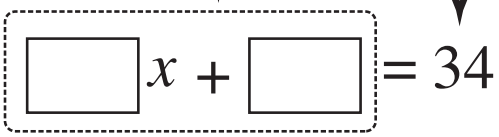
1 The diagram shows a rectangle.

1 a Write an expression for the **perimeter** of the rectangle.



1 b The **perimeter** of the rectangle is **34 cm**.

Calculate the value of x



Answer _____

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4.2 Equations and perimeter of a rectangle next steps: Test F/H

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1 The diagram shows a rectangle.

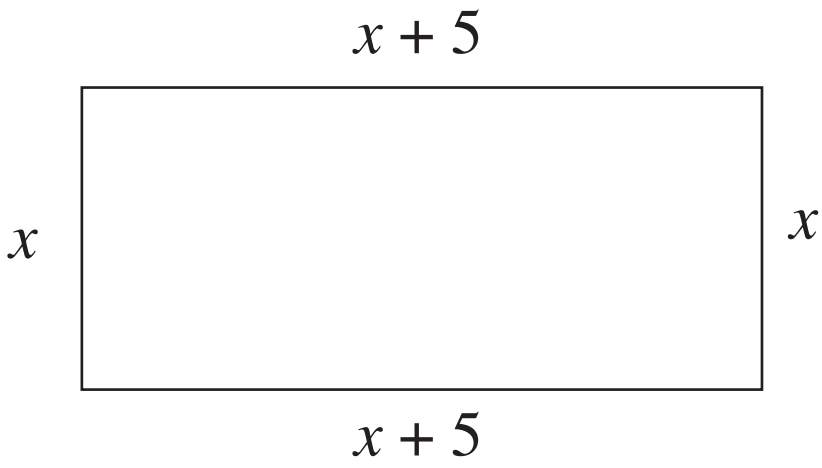


Diagram not to scale.

The perimeter of the rectangle is 26 cm.
Calculate the value of x.

Answer _____

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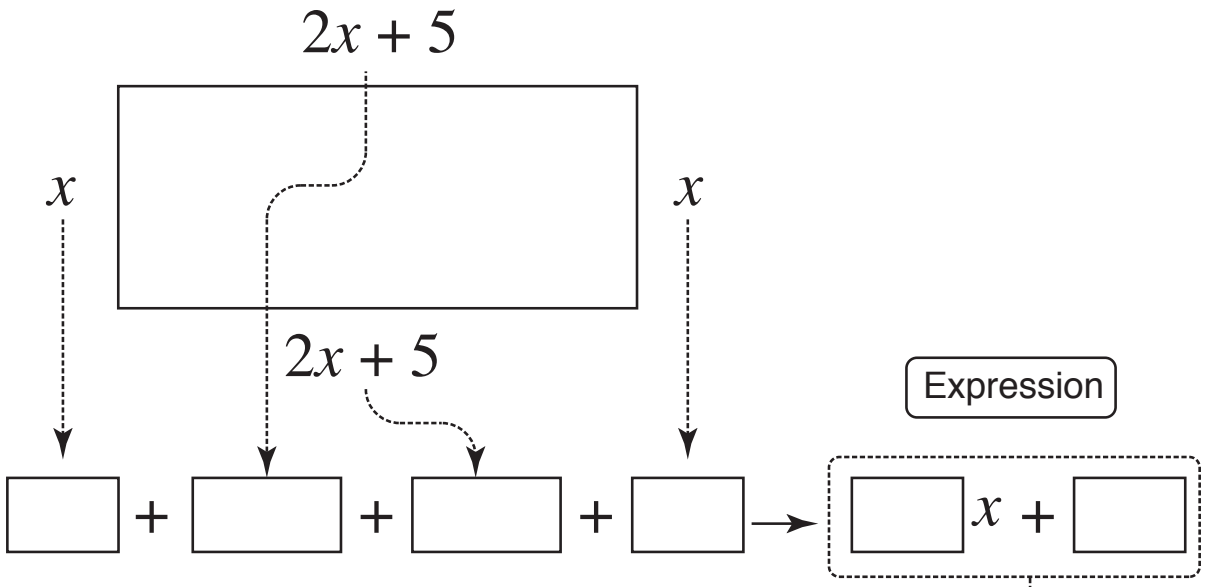
4.3 Equations and perimeter of a rectangle advanced 1

F/H

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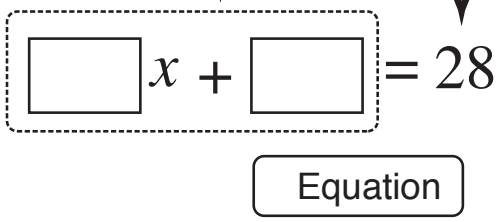
1 The diagram shows a rectangle.

1 a Write an expression for the **perimeter** of the rectangle.



1 b The **perimeter** of the rectangle is **28 cm**

Calculate the value of x



Answer _____

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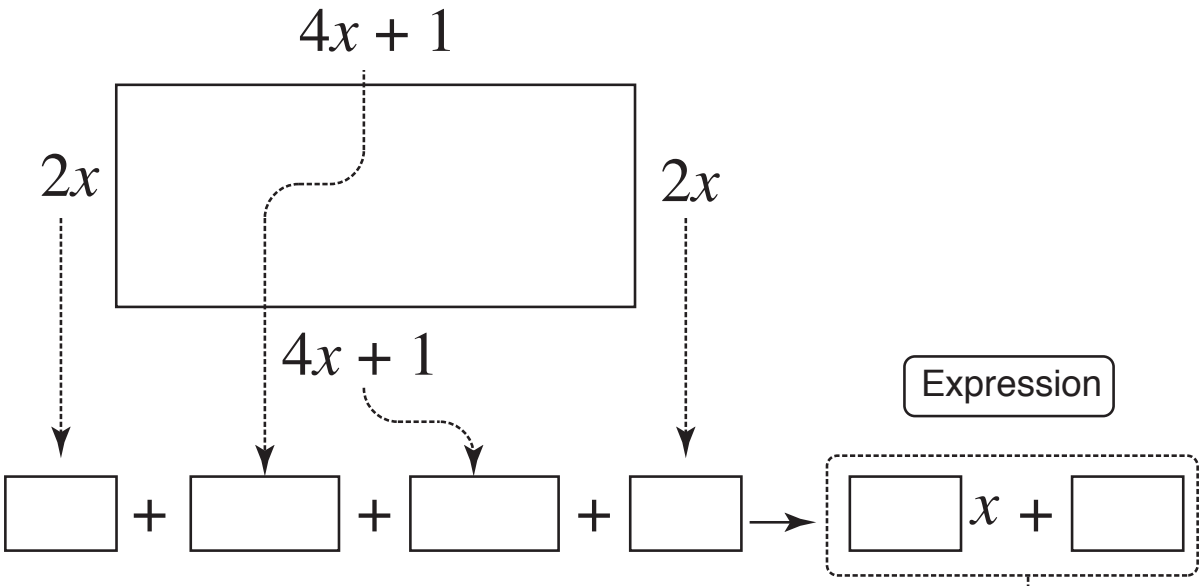
4.3 Equations and perimeter of a rectangle advanced 2

F/H

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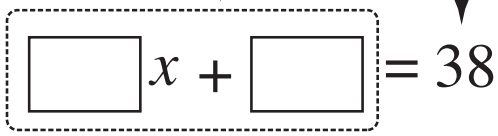
1 The diagram shows a rectangle.

1 a Write an expression for the **perimeter** of the rectangle.



1 b The **perimeter** of the rectangle is **38 cm**

Calculate the value of x



Answer _____

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4.3 Equations and perimeter of a rectangle advanced: Test

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1 The diagram shows a rectangle.

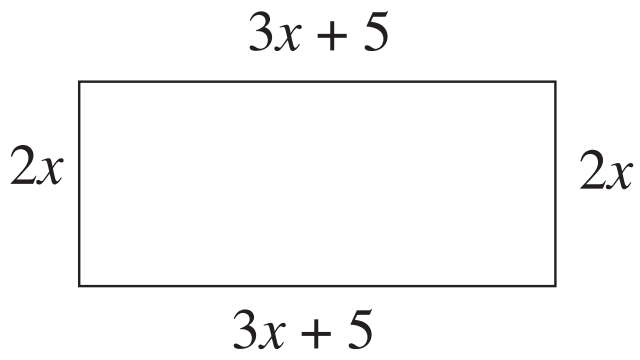


Diagram not to scale.

The perimeter of the rectangle is 40 cm
Calculate the value of x.

Answer _____

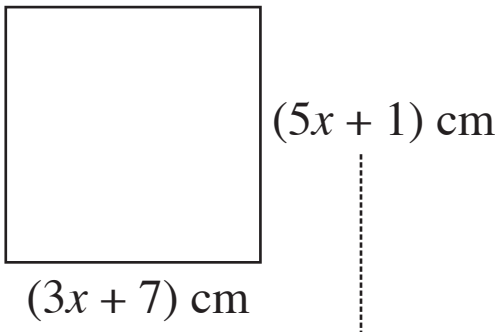
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4.4 Equations and perimeter of a square introduction 1

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1 The diagram shows a square.



1 a **Solve** the **equation**. $\square = 5x + 1$

Answer _____

1 b Work out the length of one side of the square.

$5 \times \square + 1 = \square$

Answer _____ cm

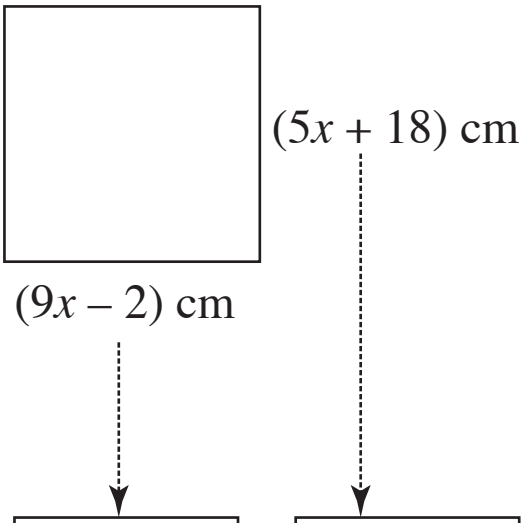
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4.4 Equations and perimeter of a square introduction 2

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1 The diagram shows a square.



1 a **Solve** the **equation**. $\square = \square$

Answer _____

1 b Work out the length of one side of the square.

$5 \times \square + 18 = \square$

Answer _____ cm

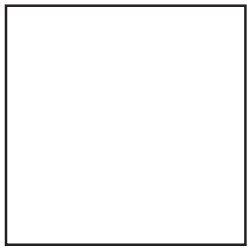
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4.4 Equations and perimeter of a square introduction: Test

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1 The diagram shows a square.



$(5x + 1)$ cm

$(2x + 7)$ cm

Work out the length of one side of the square.

Answer _____

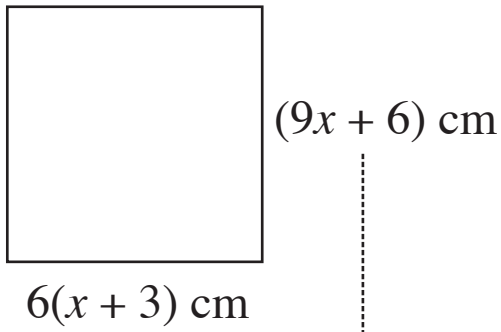
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4.5 Equations and perimeter of a square next steps 1

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1 The diagram shows a square.



1 a Expand $6(x + 3)$

Answer _____

1 b **Solve** the **equation**.

$\square = 9x + 6$

Answer _____

1 c Work out the length of one side of the square.

$9 \times \square + 6 = \square$

Answer _____ cm

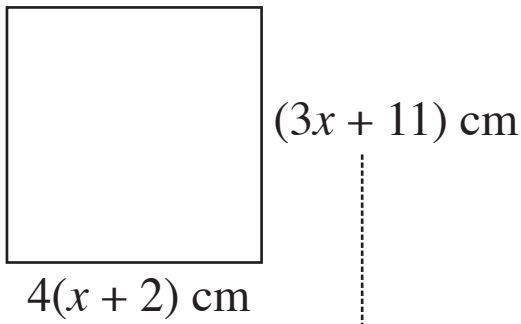
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4.5 Equations and perimeter of a square next steps 2

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1 The diagram shows a square.



1 a Expand $4(x + 2)$

Answer _____

1 b **Solve** the **equation**.

$\square = 3x + 11$

Answer _____

1 c Work out the length of one side of the square.

$3 \times \square + 11 = \square$

Answer _____ cm

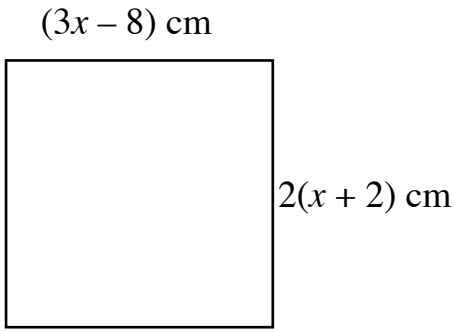
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4.5 Equations and perimeter of a square next steps: Test

F/H

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1 The diagram shows a square.



Work out the length of one side of the square.

Answer _____

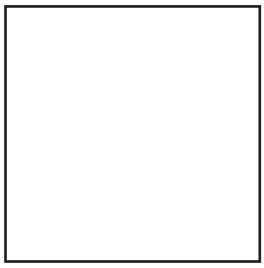
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4.6 Equations and perimeter of a square advanced 1

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1 The diagram shows a square.



$4(x + 2)$ cm

$2(x + 14)$ cm

1 a Expand $2(x + 14)$

1 b Expand $4(x + 2)$

Answer

Answer

1 c **Solve** the **equation**.

$\square = \square$

Answer

1 d Work out the length of one side of the square.

$4 \times (\square + 2) = \square$

Answer cm

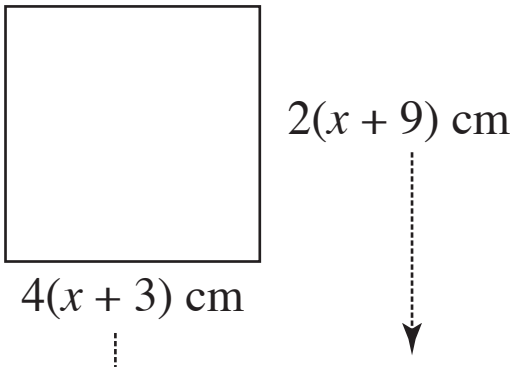
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4.6 Equations and perimeter of a square advanced 2

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1 The diagram shows a square.



1 a Expand $4(x + 3)$

1 b Expand $2(x + 9)$

Answer

Answer

1 c **Solve** the **equation**.

$$\square = \square$$

Answer

1 d Work out the length of one side of the square.

$$2 \times (\square + 9) = \square$$

Answer _____ cm

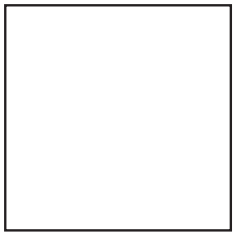
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4.6 Equations and perimeter of a square advanced: Test

F/H

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1 The diagram shows a square.



Work out the length of one side of the square.

Answer _____

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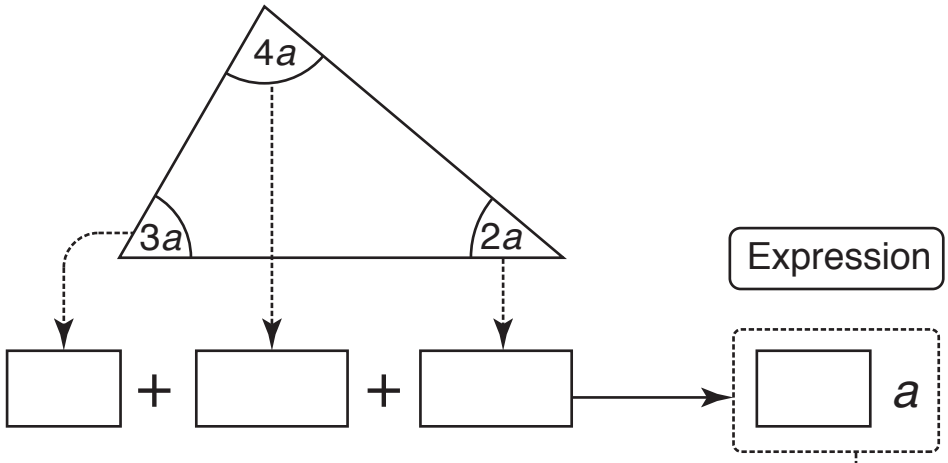
4.7 Equations and angles in a triangle introduction 1

F/H

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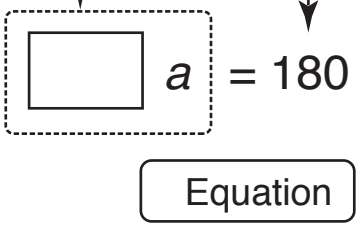
1 The diagram shows a triangle.

1 a Write an expression for the **sum** of the angles in the triangle.



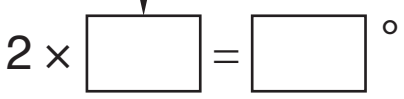
1 b The **sum** of the angles in a triangle equals 180°

Calculate the value of *a*



Answer _____

1 c Calculate the size of the smallest angle in the triangle.



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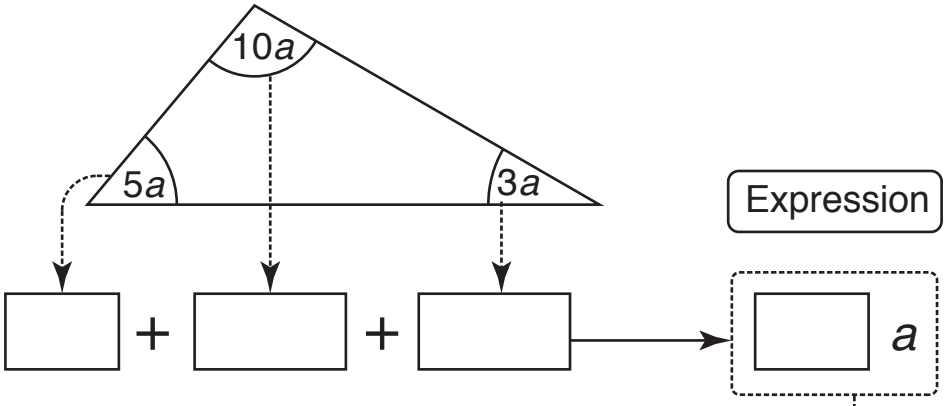
4.7 Equations and angles in a triangle introduction 2

F/H

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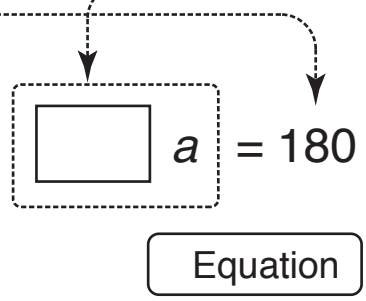
1 The diagram shows a triangle.

1 a Write an expression for the **sum** of the angles in the triangle.



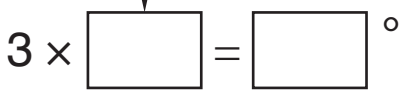
1 b The **sum** of the angles in a triangle equals 180°

Calculate the value of *a*



Answer _____

1 c Calculate the size of the smallest angle in the triangle.



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4.7 Equations and angles in a triangle introduction: Test

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1 The diagram shows a triangle.

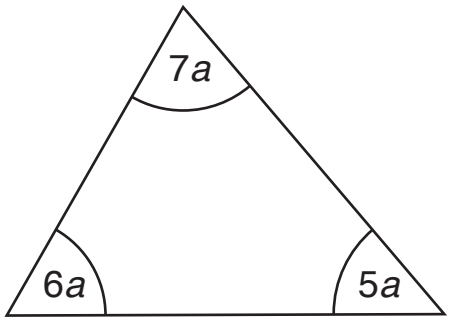


Diagram not to scale.

Work out the size of the smallest angle in the triangle.

Answer _____

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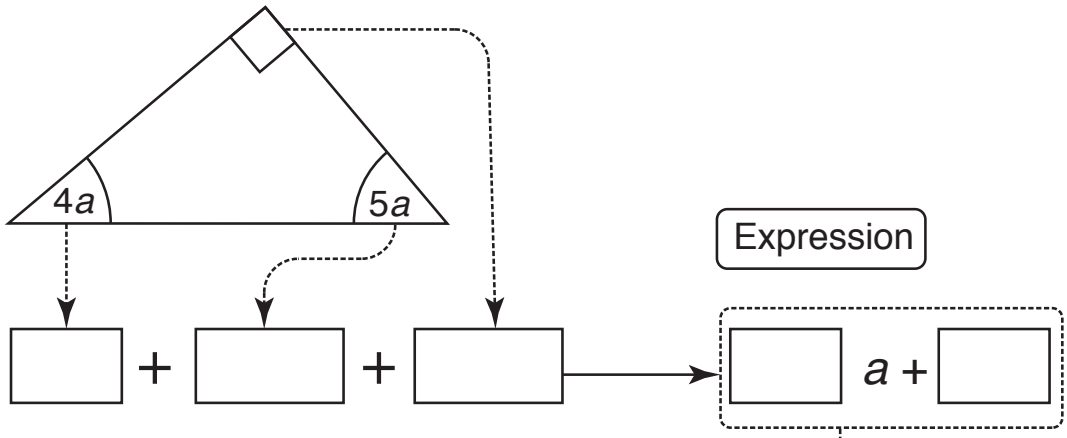
4.8 Equations and angles in a triangle next steps 1

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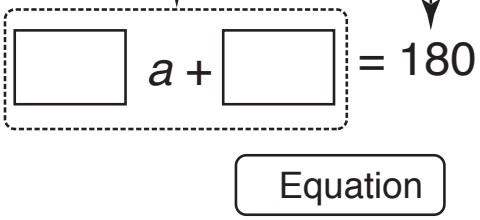
1 The diagram shows a triangle.

1 a Write an expression for the **sum** of the angles in the triangle.



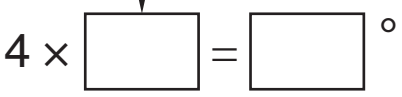
1 b The **sum** of the angles in a triangle equals 180°

Calculate the value of *a*



Answer _____

1 c Calculate the size of the smallest angle in the triangle.



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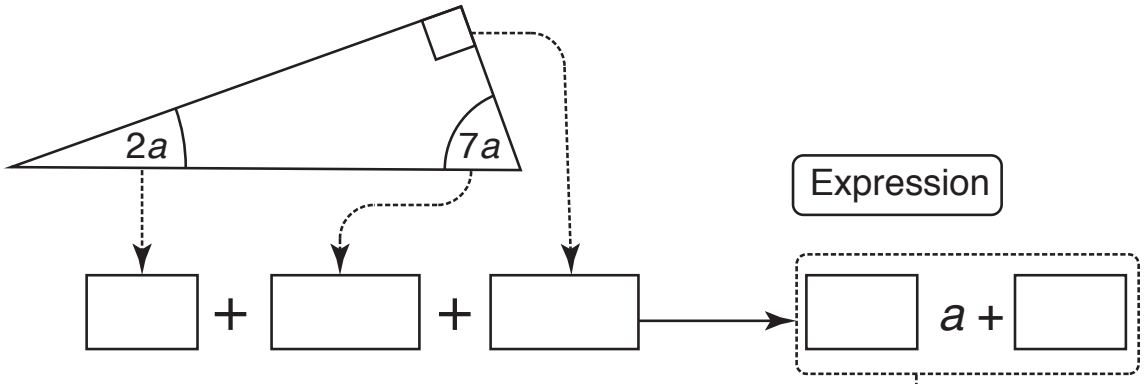
4.8 Equations and angles in a triangle next steps 2

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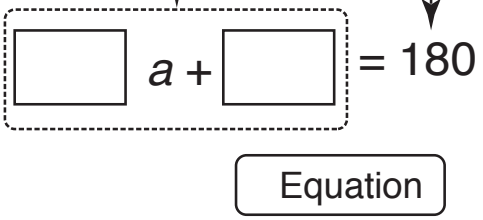
1 The diagram shows a triangle.

1 a Write an expression for the **sum** of the angles in the triangle.



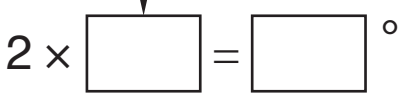
1 b The **sum** of the angles in a triangle equals 180°

Calculate the value of *a*



Answer _____

1 c Calculate the size of the smallest angle in the triangle.



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4.8 Equations and angles in a triangle next steps: Test

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1 The diagram shows a triangle.

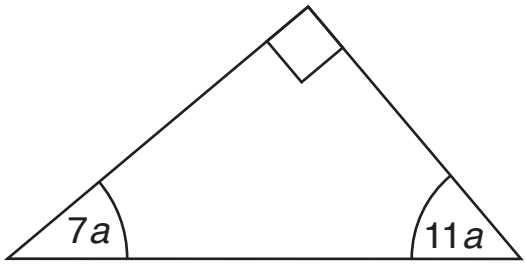


Diagram not to scale.

Work out the size of the smallest angle in the triangle.

Answer _____

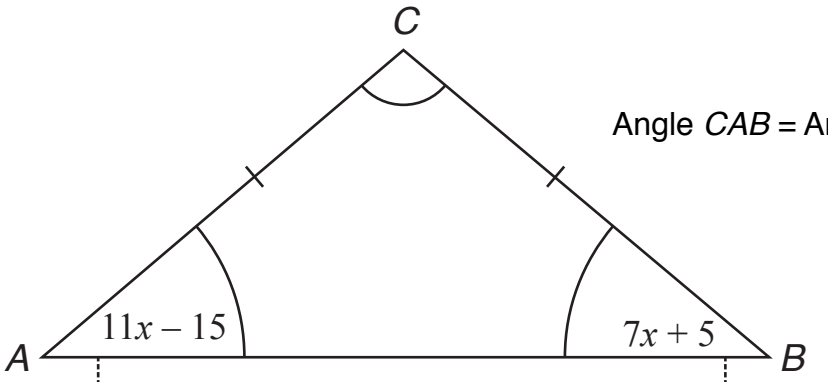
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4.9 Equations and angles in a triangle advanced 1

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1 Here is an isosceles triangle.



1 a **Solve** the **equation** $\square = \square$

Equation

Answer _____

1 b Calculate angle *ABC*.

$7 \times \square + 5 = \square^{o}$

1 c Calculate angle *ACB*.

$180 - (2 \times \square) = \square^{o}$

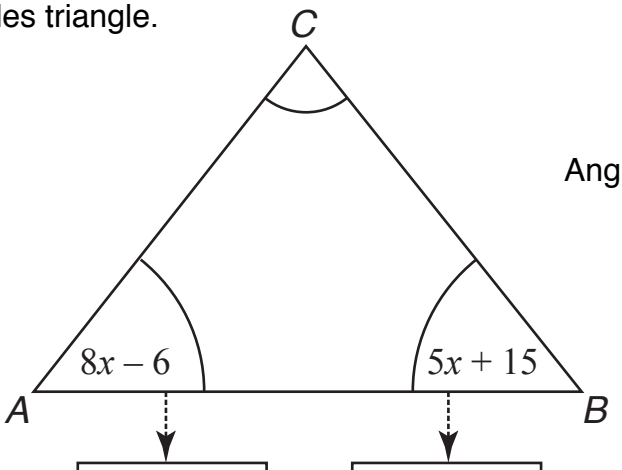
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4.9 Equations and angles in a triangle advanced 2

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1 Here is an isosceles triangle.



Angle *CAB* = Angle *ABC*

1 a **Solve** the **equation** $\square = \square$

Equation

Answer _____

1 b Calculate angle *ABC*.

$5 \times \square + 15 = \square^{o}$

1 c Calculate angle *ACB*.

$180 - (2 \times \square) = \square^{o}$

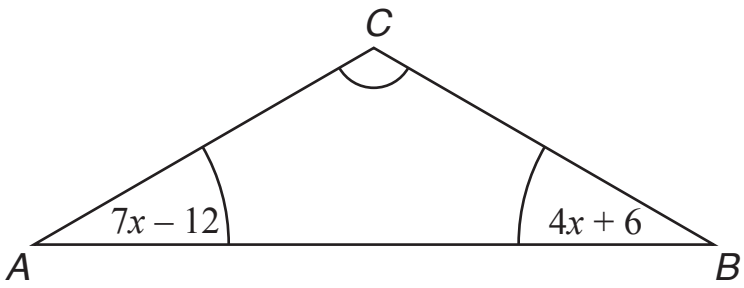
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4.9 Equations and angles in a triangle advanced: Test

F/H

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1 Here is an isosceles triangle.



Angle *CAB* = Angle *ABC*

Calculate angle *ACB.*

Answer _____

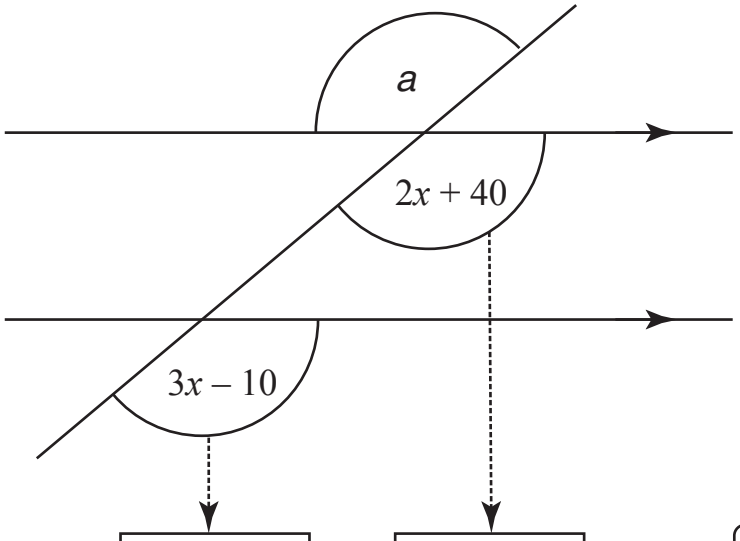
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4.10 Equations and angles introduction 1

F/H

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1 Three straight lines are shown.



1 a **Solve** the **equation** $\square = \square$

Equation

Answer _____

1 b Vertically opposite angles are equal.
Calculate the size of angle *a*

$2 \times \square + 40 = \square^{\circ}$

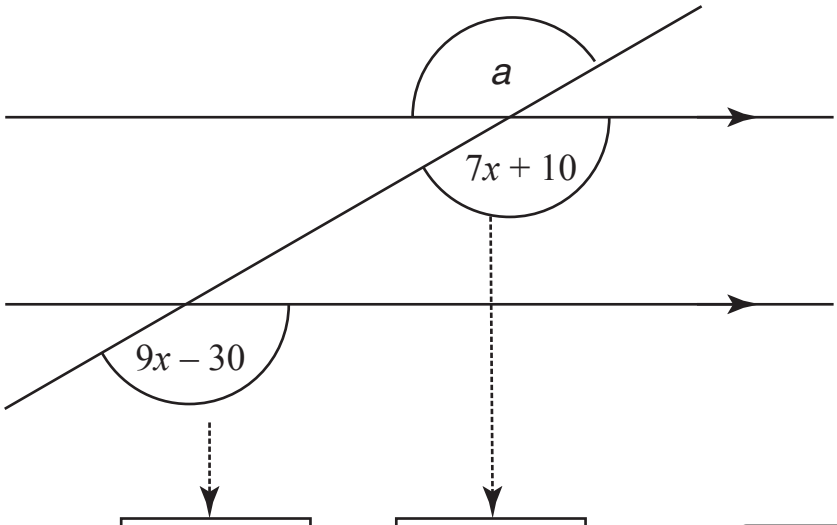
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4.10 Equations and angles introduction 2

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1 Three straight lines are shown.



1 a **Solve** the **equation** $\square = \square$

Equation

Answer _____

1 b Vertically opposite angles are equal.
Calculate the size of angle *a*

$7 \times \square + 10 = \square^{\circ}$

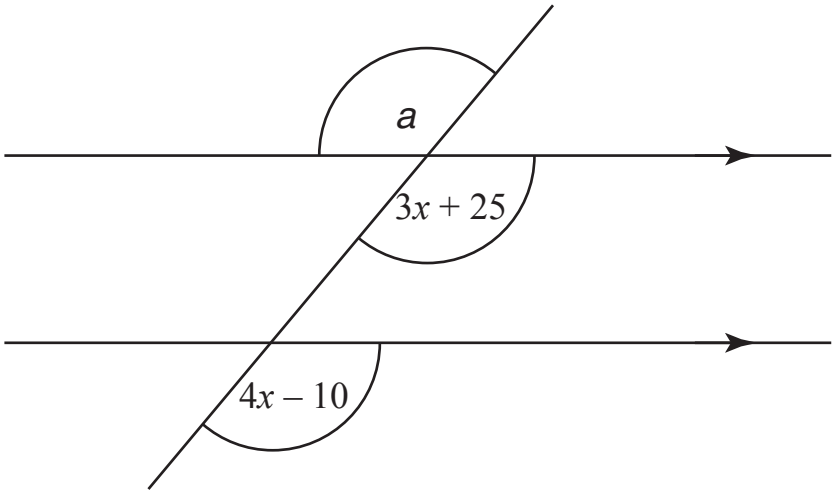
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4.10 Equations and angles introduction: Test

F/H

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1 Three straight lines are shown.



Calculate the size of angle *a*

Answer _____

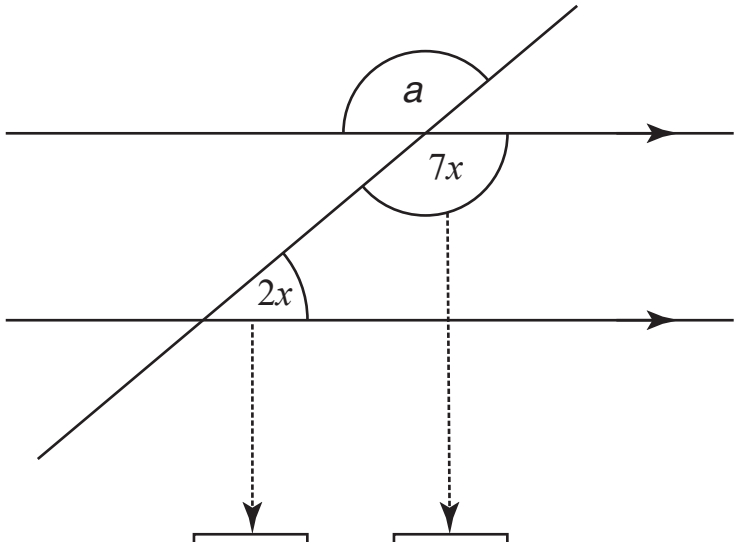
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4.11 Equations and angles next steps 1

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1 Three straight lines are shown.



1 a **Solve** the **equation** $\square + \square = 180$

Equation

Answer _____

1 b Vertically opposite angles are equal.
Calculate the size of angle *a*

$7 \times \square = \square^{o}$

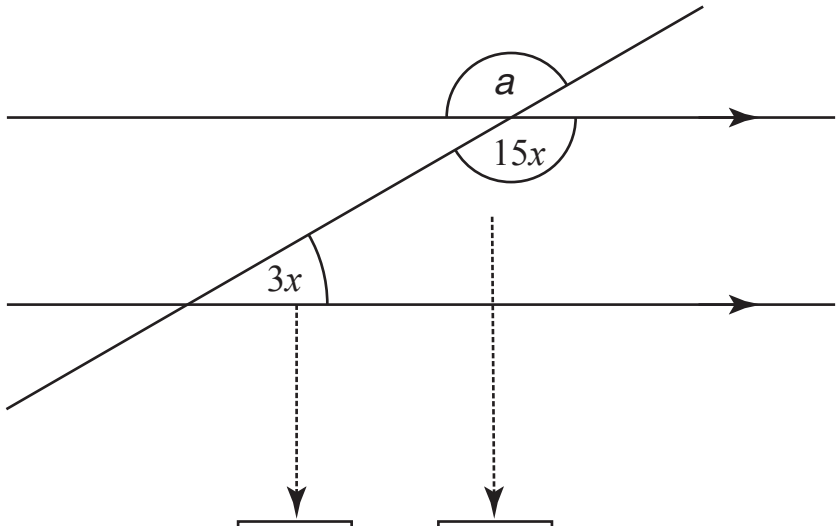
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4.11 Equations and angles next steps 2

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1 Three straight lines are shown.



1 a **Solve** the **equation** $\square + \square = 180$

Equation

Answer _____

1 b Vertically opposite angles are equal.
Calculate the size of angle *a*

$15 \times \square = \square°$

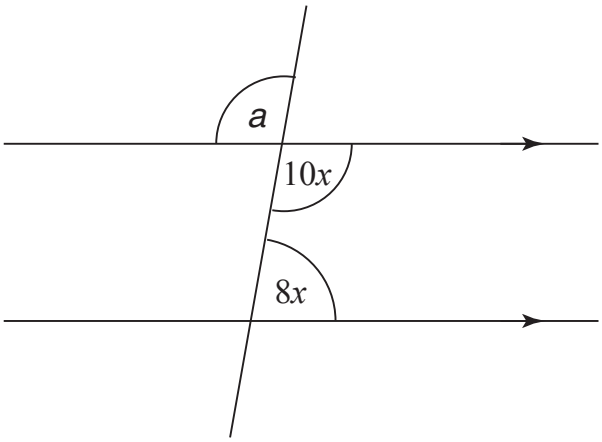
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4.11 Equations and angles next steps: Test

F/H

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1 Three straight lines are shown.



Calculate the size of angle *a*

Answer _____

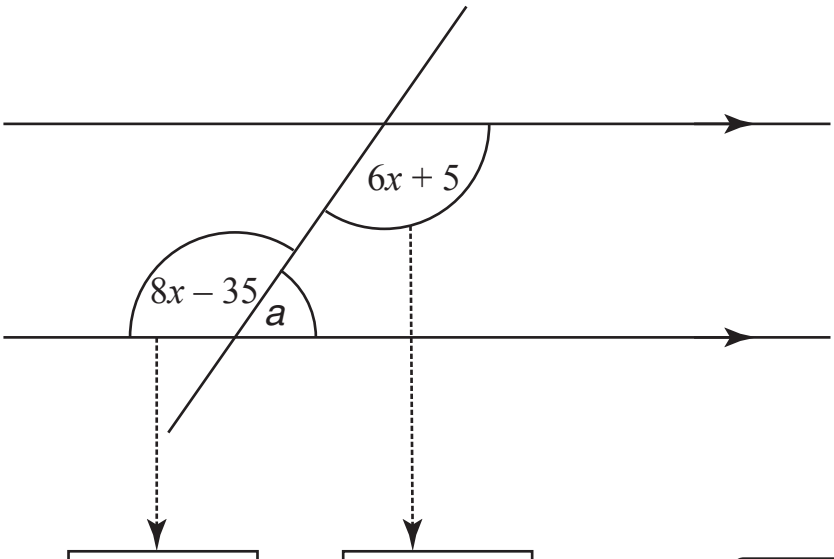
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4.12 Equations and angles advanced 1

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1 Three straight lines are shown.



1 a **Solve** the **equation** $\square = \square$

Equation

Answer _____

1 b The sum of the angles on a straight line is 180°
Calculate the size of angle *a*

$180 - (8 \times \square - 35) = \square°$

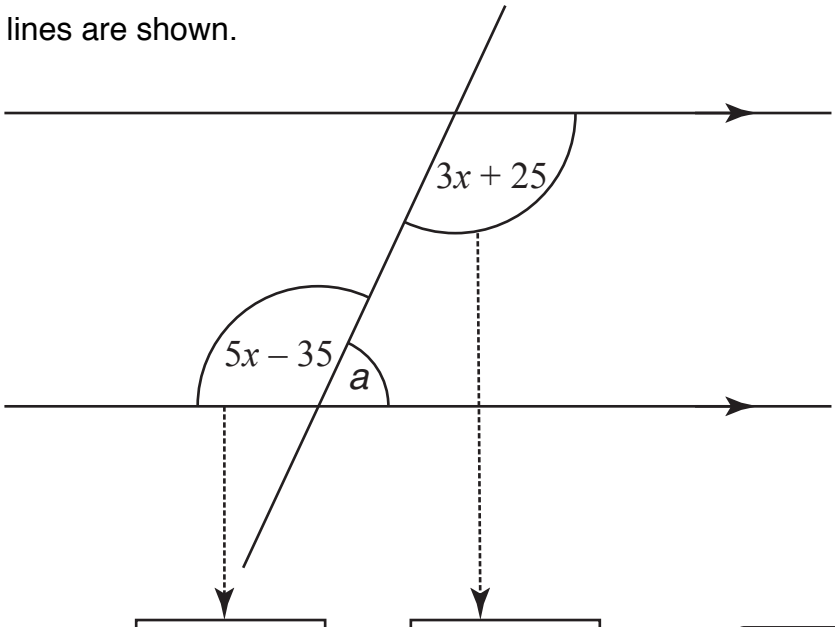
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4.12 Equations and angles advanced 2

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1 Three straight lines are shown.



1 a **Solve** the **equation** $\square = \square$

Equation

Answer _____

1 b The sum of the angles on a straight line is 180°
Calculate the size of angle *a*

$180 - (5 \times \square - 35) = \square^{\circ}$

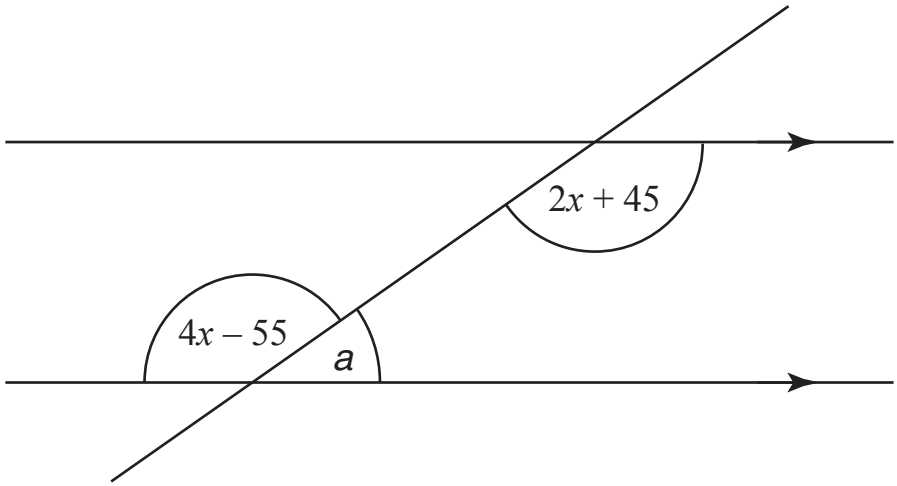
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4.12 Equations and angles advanced: Test

F/H

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1 Three straight lines are shown.



Calculate the size of angle *a*

Answer _____

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5 Perimeter

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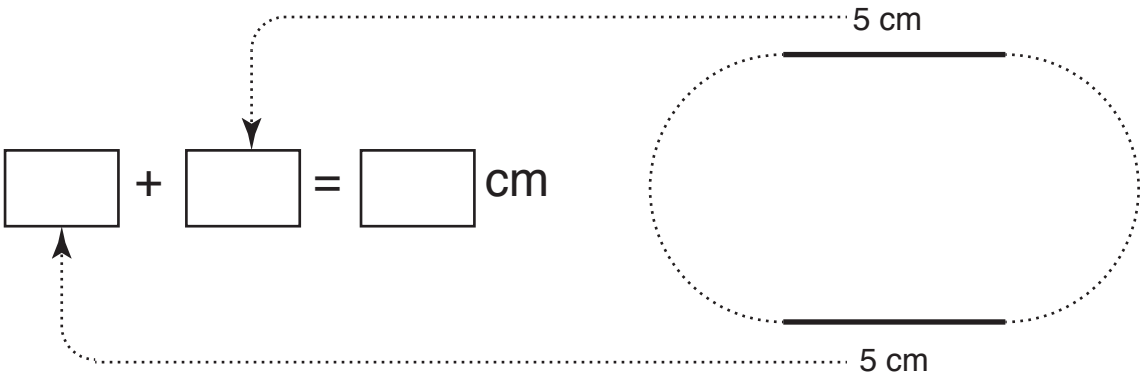
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5.1 Perimeter of Compound Shapes Introduction 1

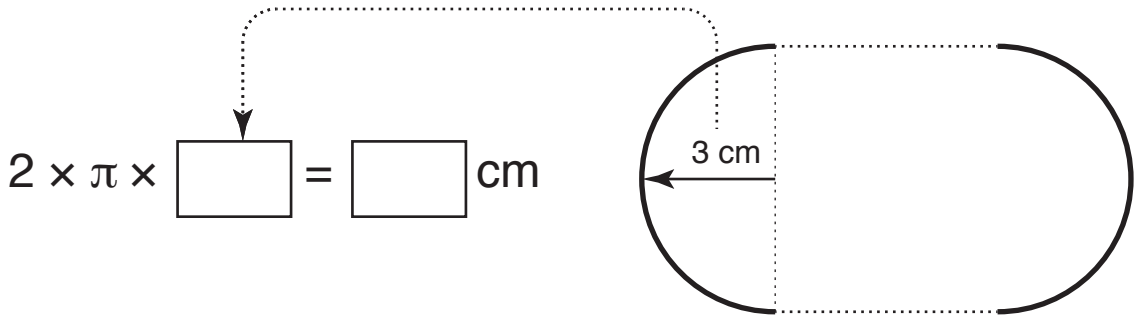
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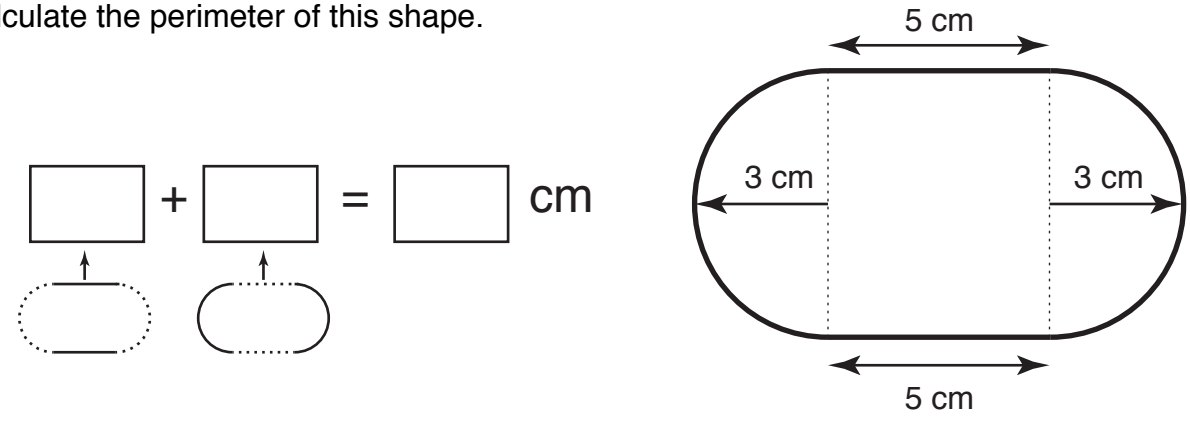
1a The shape has two straight sides each of length 5 cm.
Write down the total length of the straight sides.



1b Each end of the shape is a semicircle of radius 3 cm.
Calculate the circumference of the circle.
Give your answer to one place of decimals.



1c Calculate the perimeter of this shape.



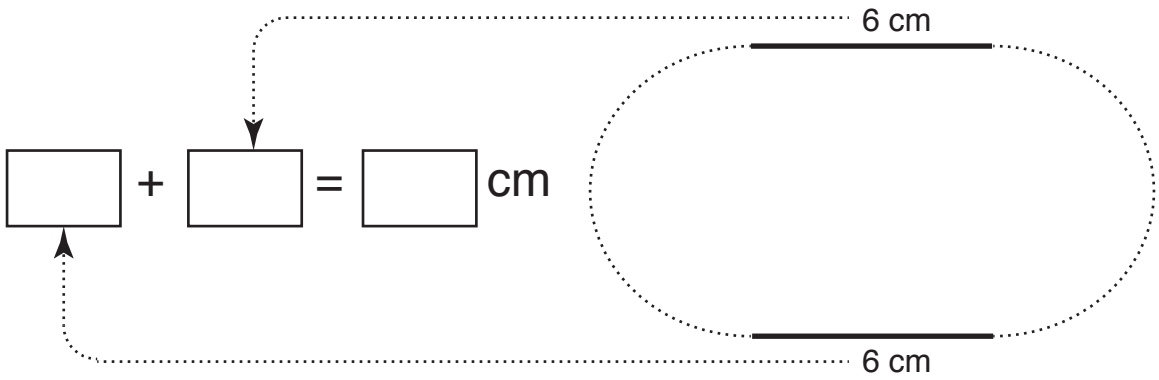
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5.1 Perimeter of Compound Shapes Introduction 2

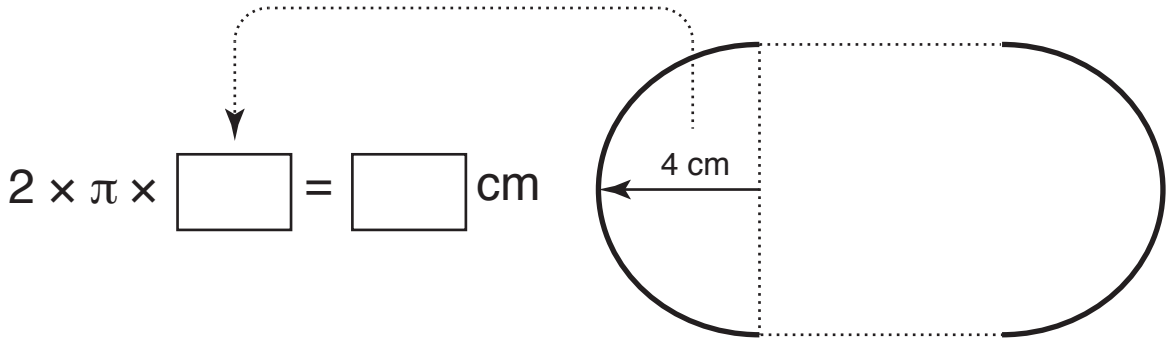
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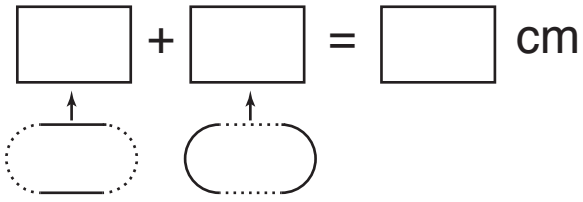
1a The shape has two straight sides each of length 6 cm.
Write down the total length of the straight sides.

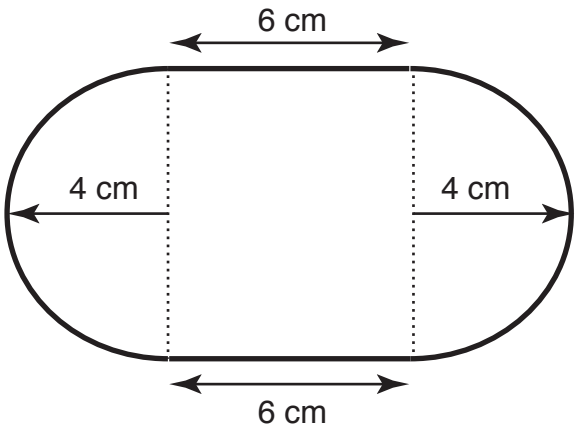


1b Each end of the shape is a semicircle of radius 4 cm.
Calculate the circumference of the circle.
Give your answer to one place of decimals.



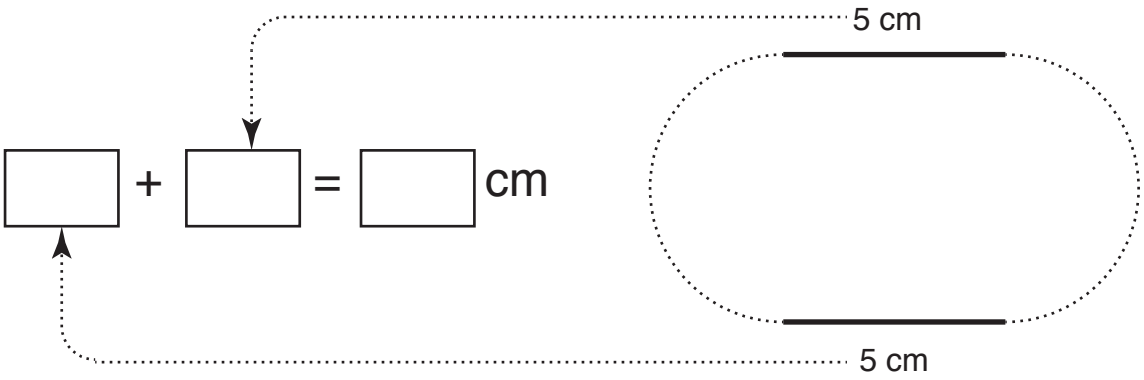
1c Calculate the perimeter of this shape.



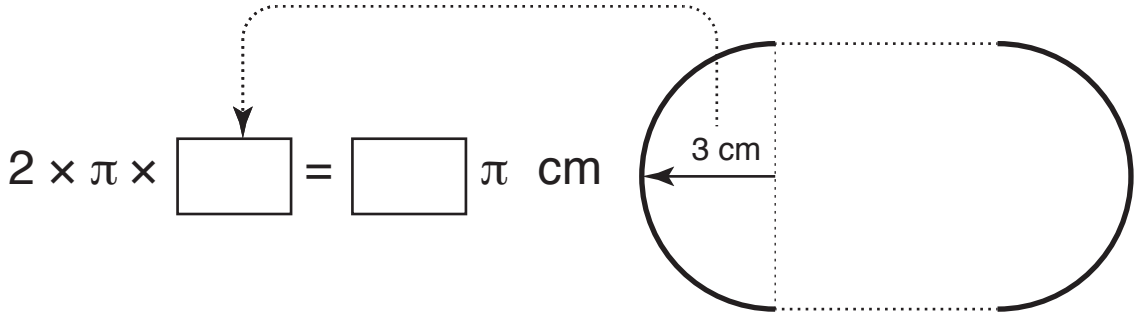


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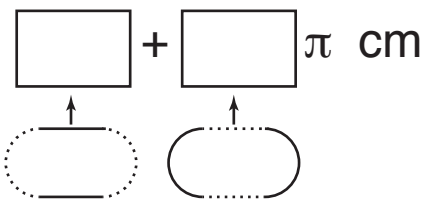
1a The shape has two straight sides each of length 5 cm.
Write down the total length of the straight sides.

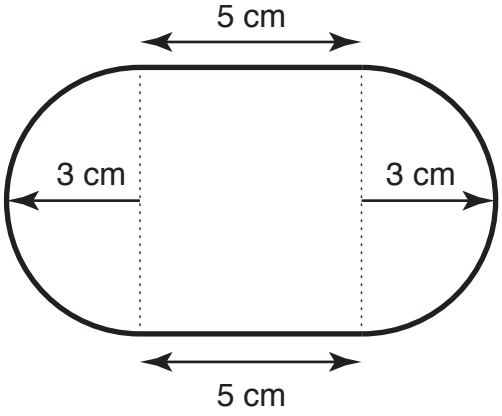


1b Each end of the shape is a semicircle of radius 3 cm.
Calculate the circumference of the circle.
Give your answer in terms of π



1c Calculate the perimeter of this shape.
Give your answer in terms of π





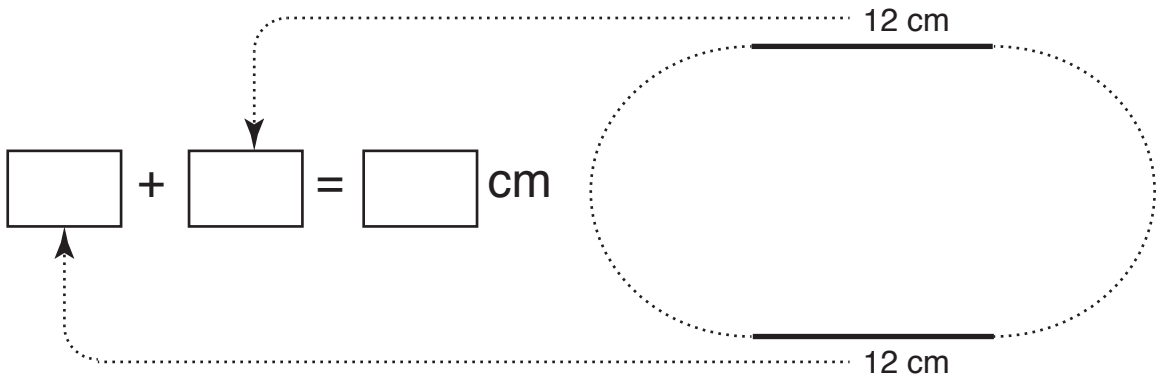
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5.2 Perimeter of Compound Shapes Next Steps 2

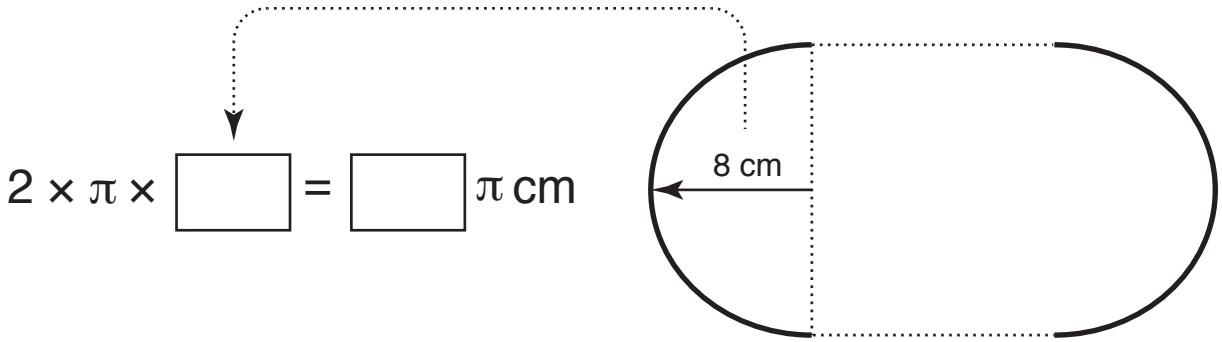
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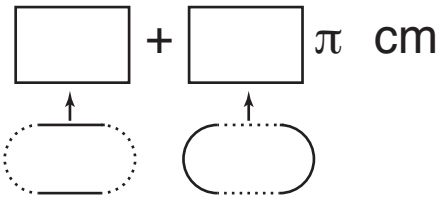
1a The shape has two straight sides each of length 12 cm.
Write down the total length of the straight sides.

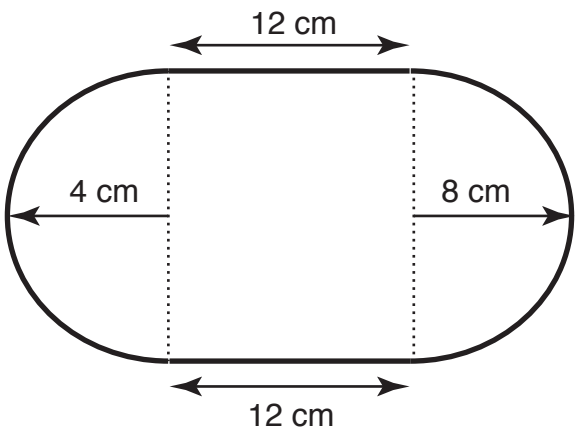


1b Each end of the shape is a semicircle of radius 8 cm.
Calculate the circumference of the circle.
Give your answer in terms of π



1c Calculate the perimeter of this shape.
Give your answer in terms of π





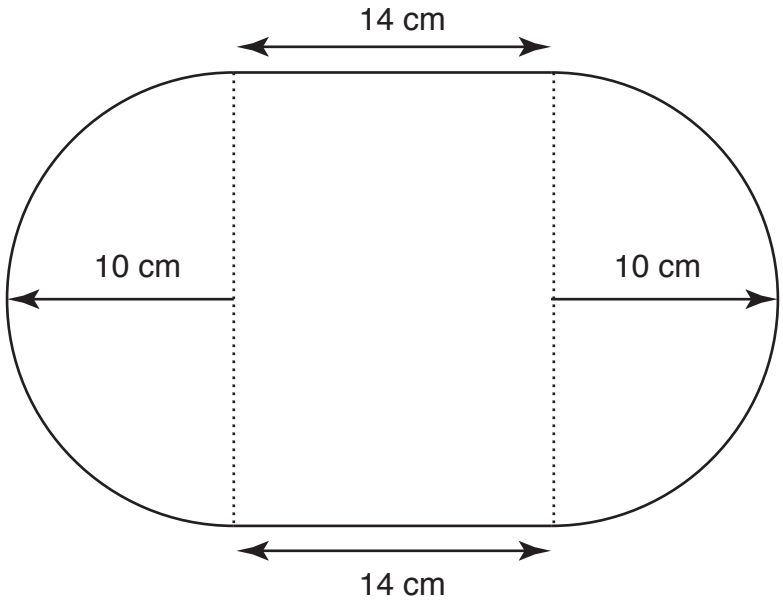
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5.2 Perimeter of Compound Shapes Next Steps: Test

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1



The diagram shows two straight sides each of length 14 cm
Each end of the shape is a semicircle of radius 10 cm.

Calculate the perimeter of the shape.
Give your answer in terms of π

Answer _____

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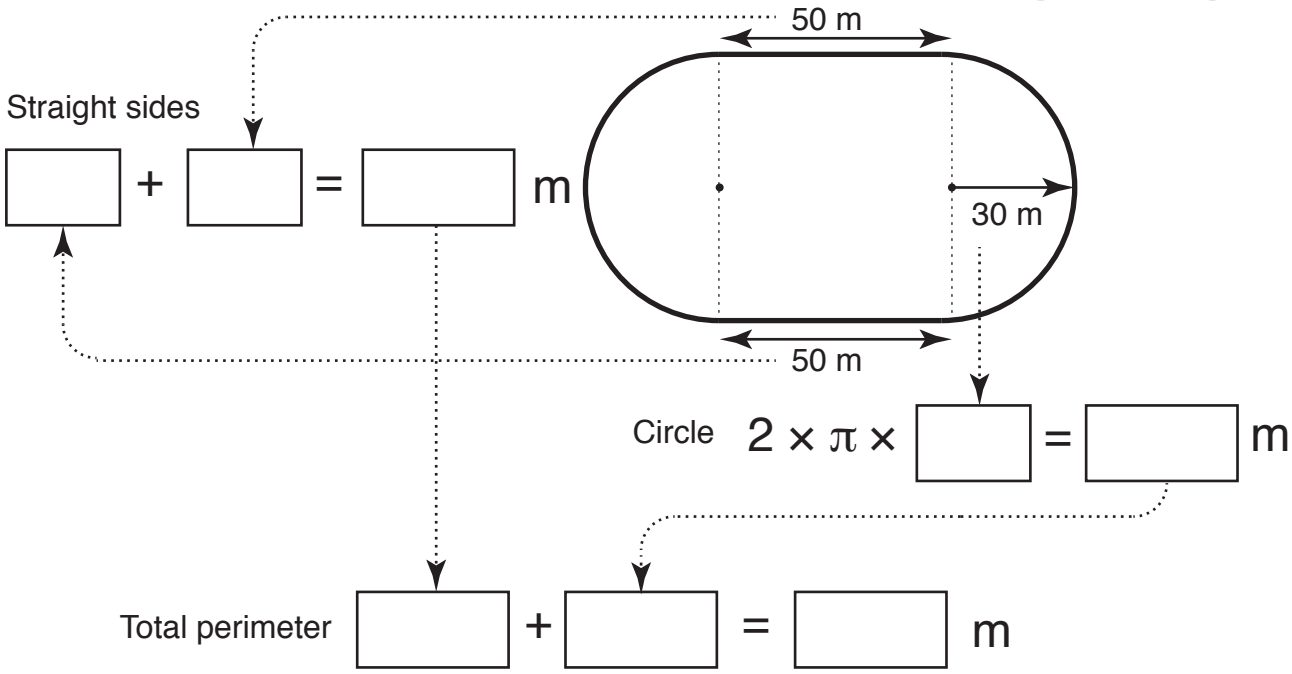
5.3 Perimeter of Compound Shapes Advanced 1

F/H

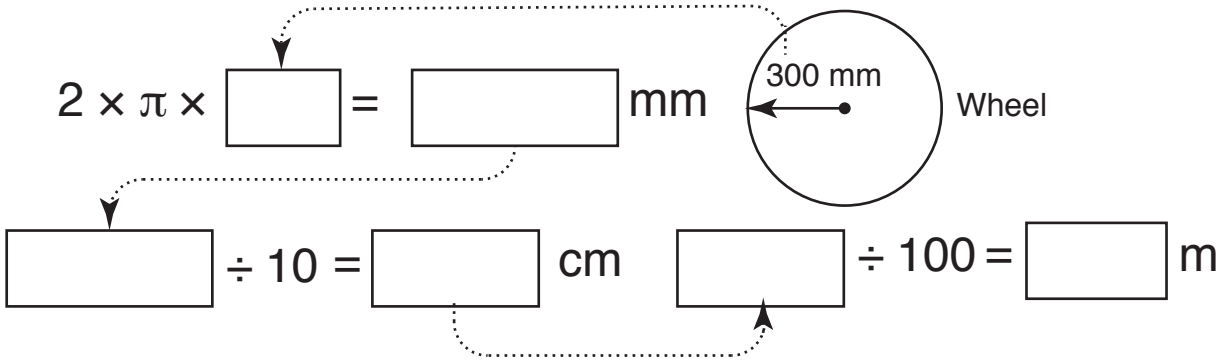
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1a The diagram shows a cycle track.
The track has two straight sides each of length 50 m.
Each end of the track is a semicircle of radius 30 m.
Calculate the perimeter of the track.

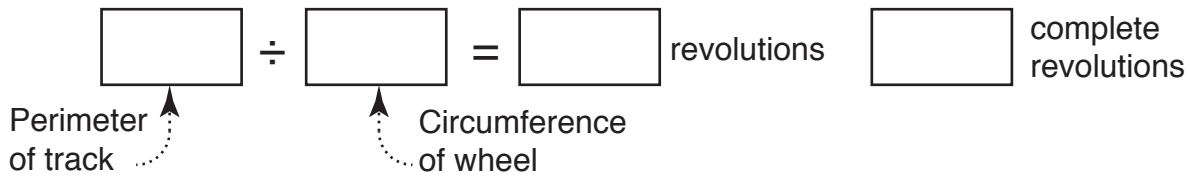




1b The radius of each wheel of Paul's bike is 300 mm.
Calculate the circumference of the wheel in metres.



1c Paul is going to ride his bike around the track once.
Calculate how many complete revolutions each wheel of his bike will make.



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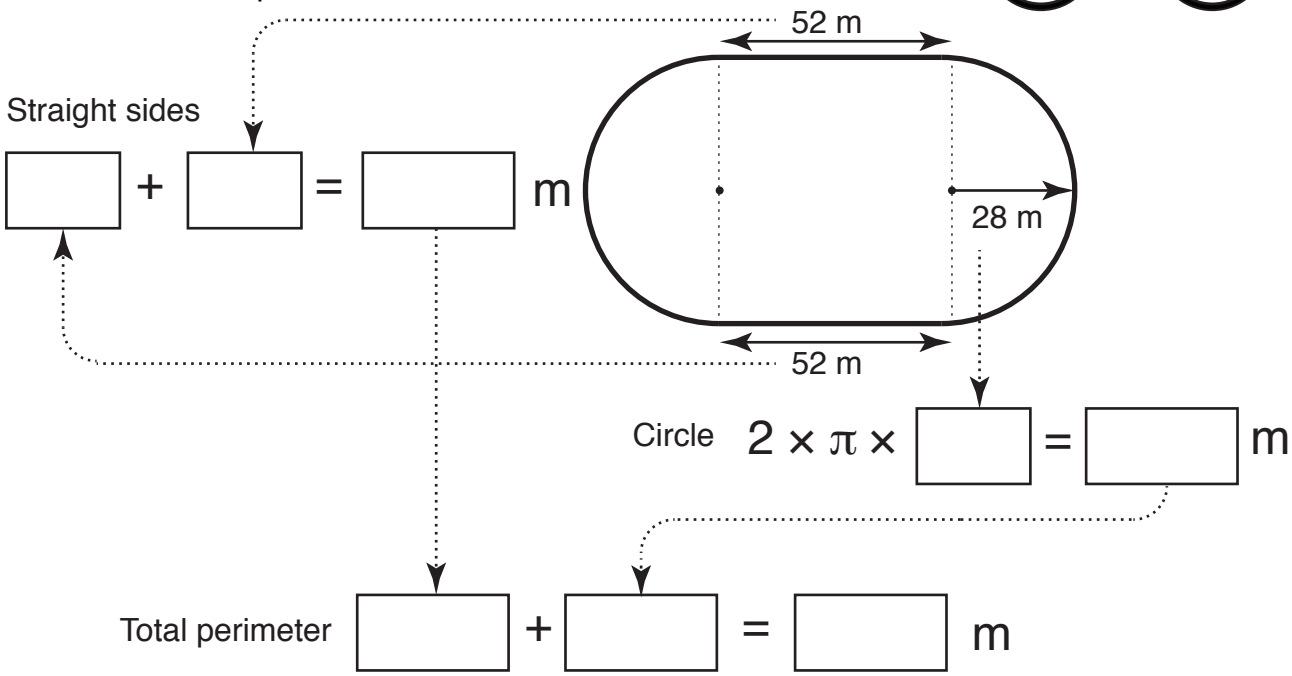
5.3 Perimeter of Compound Shapes Advanced 2

F/H

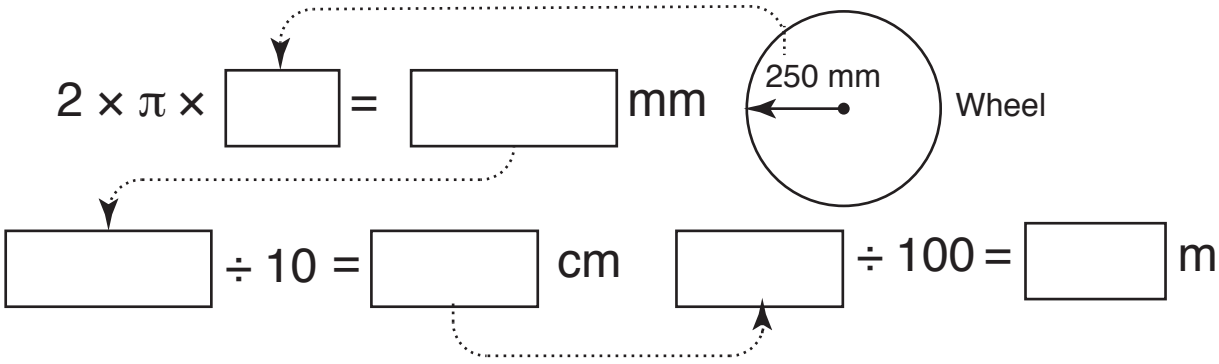
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1a The diagram shows a cycle track.
The track has two straight sides each of length 52 m.
Each end of the track is a semicircle of radius 28 m.
Calculate the perimeter of the track.

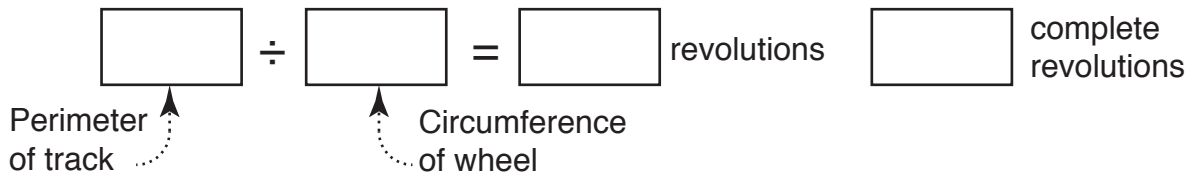




1b The radius of each wheel of Paul's bike is 250 mm.
Calculate the circumference of the wheel in metres.



1c Paul is going to ride his bike around the track once.
Calculate how many complete revolutions each wheel of his bike will make.



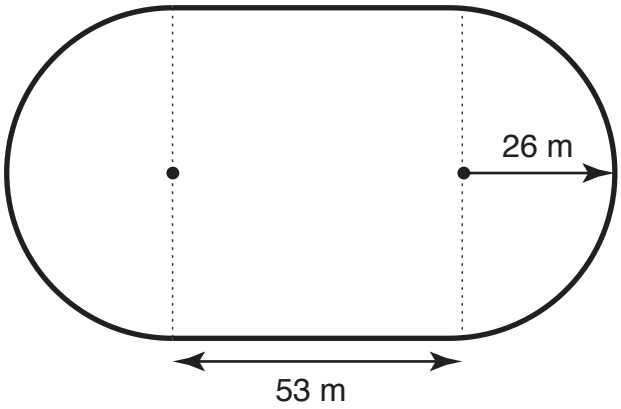
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5.3 Perimeter of Compound Shapes Advanced: Test

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1 The diagram shows a cycle track.





The track has two straight sides each of length 53 m.
Each end of the track is a semicircle of radius 26 m.

The radius of each wheel of Mary's bike is 270 mm.
Mary is going to ride her bike around the track once.

Calculate how many complete revolutions each wheel of her bike will make.

Answer _____

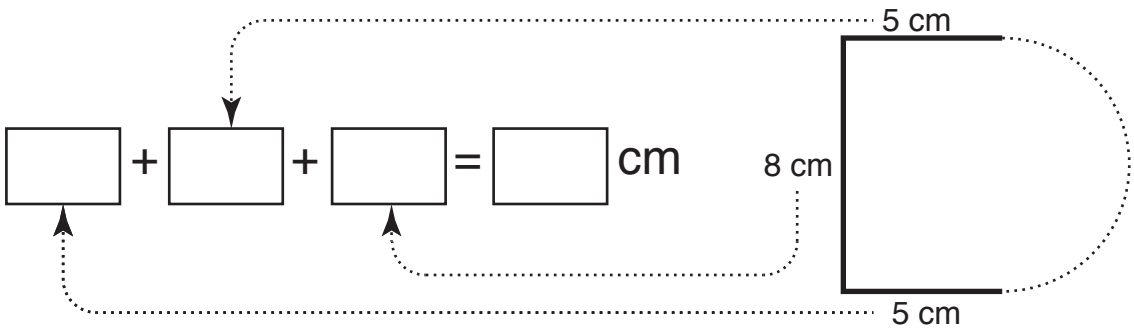
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5.4 Perimeter with a semicircle introduction 1

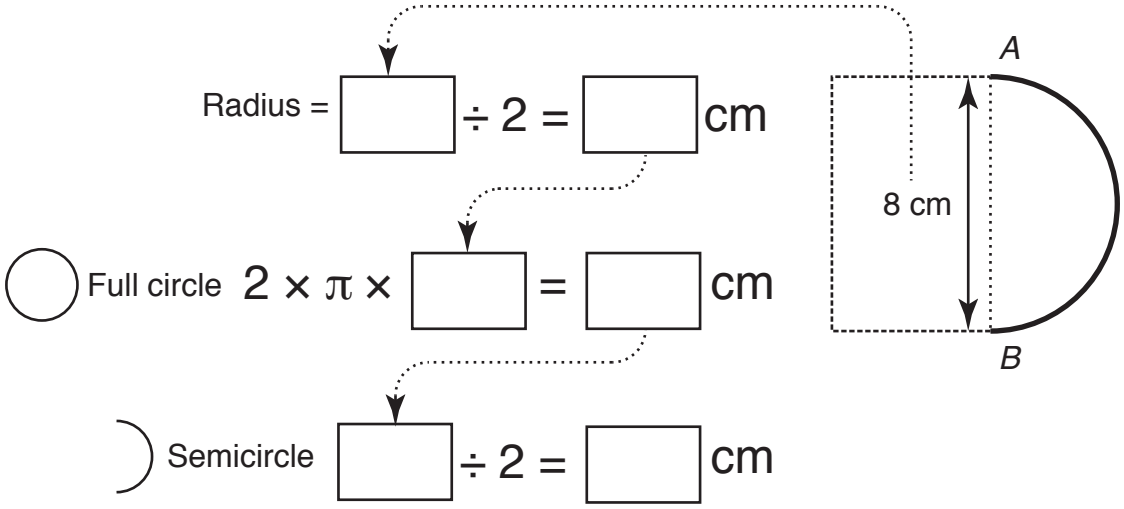
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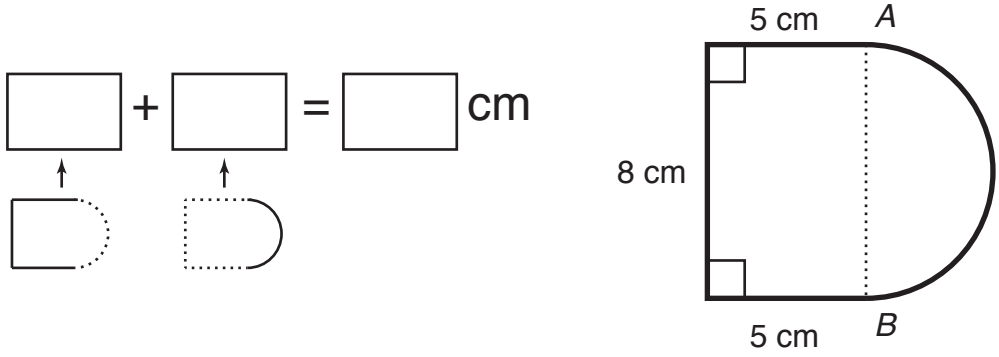
1a The shape has three straight sides.
Write down the total length of the straight sides.



1b At the end of the shape is a semicircle.
AB is the diameter of the semicircle.
Calculate the perimeter of the semicircle.
Give your answer to one place of decimals.



1c Calculate the perimeter of this shape.



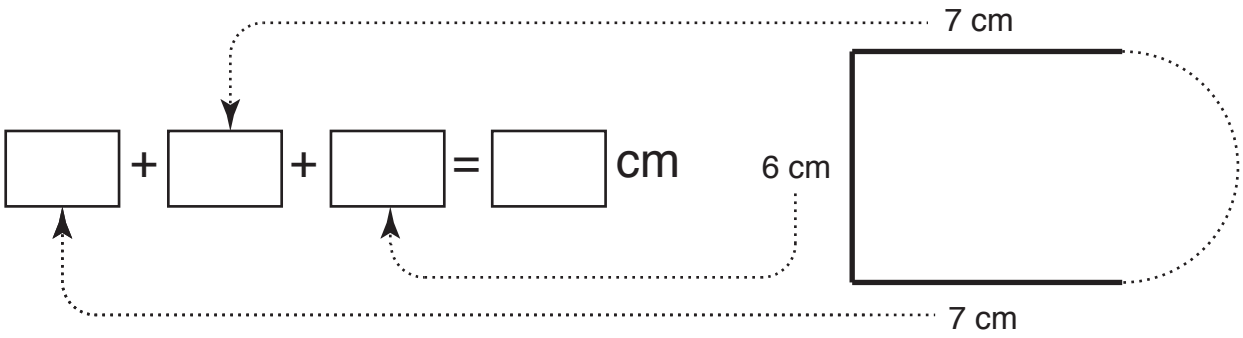
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5.4 Perimeter with a semicircle introduction 2

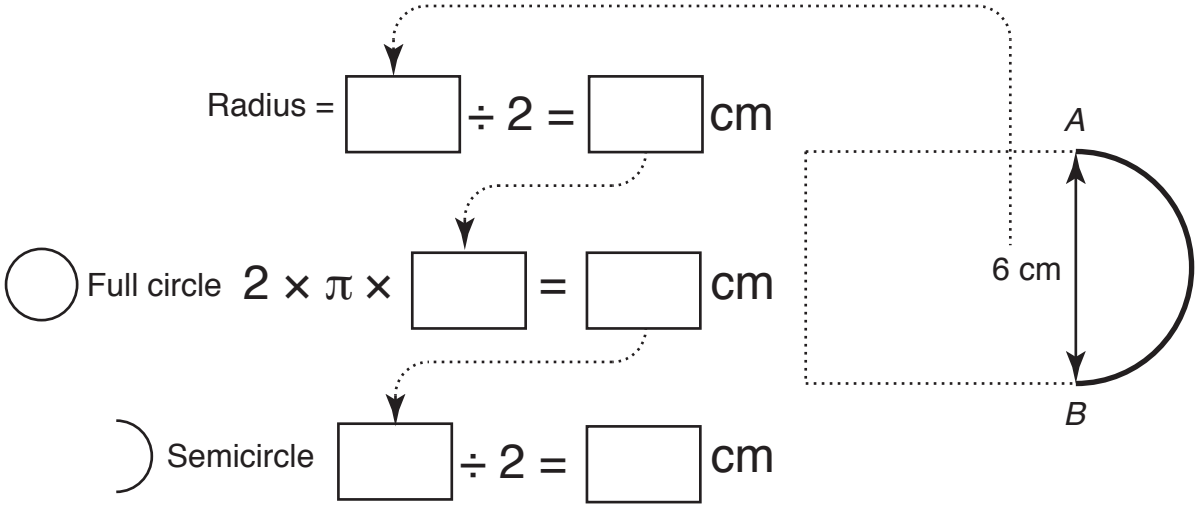
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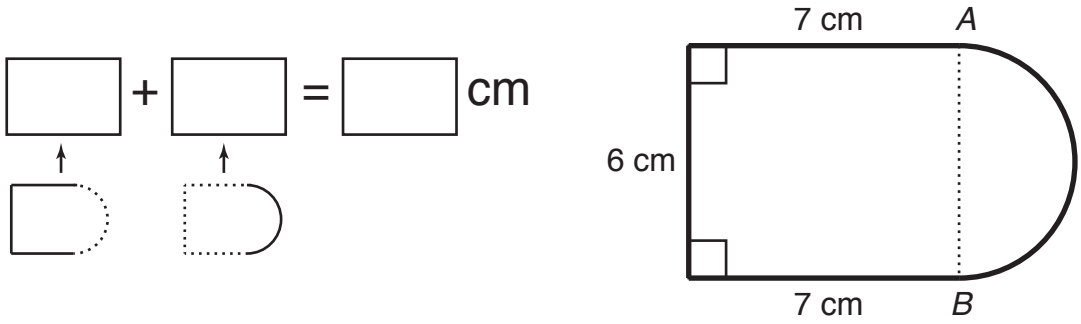
1a The shape has three straight sides.
Write down the total length of the straight sides.



1b At the end of the shape is a semicircle.
AB is the diameter of the semicircle.
Calculate the perimeter of the semicircle.
Give your answer to one place of decimals.



1c Calculate the perimeter of this shape.



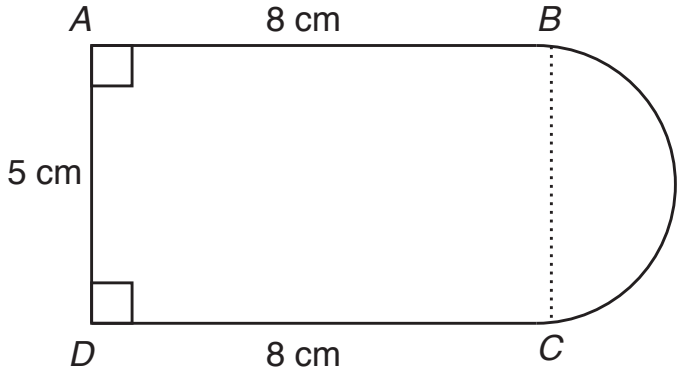
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5.4 Perimeter with a semicircle introduction: Test

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1 The diagram shows a shape made of a rectangle *ABCD* and a semicircle.
BC is the diameter of the semicircle.



Calculate the perimeter of the shape.
Give your answer to one place of decimals.

Answer _____

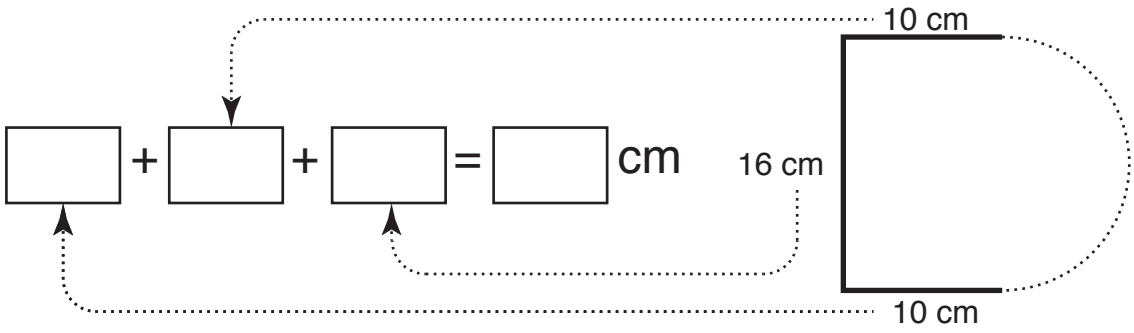
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5.5 Perimeter with a semicircle advanced 1

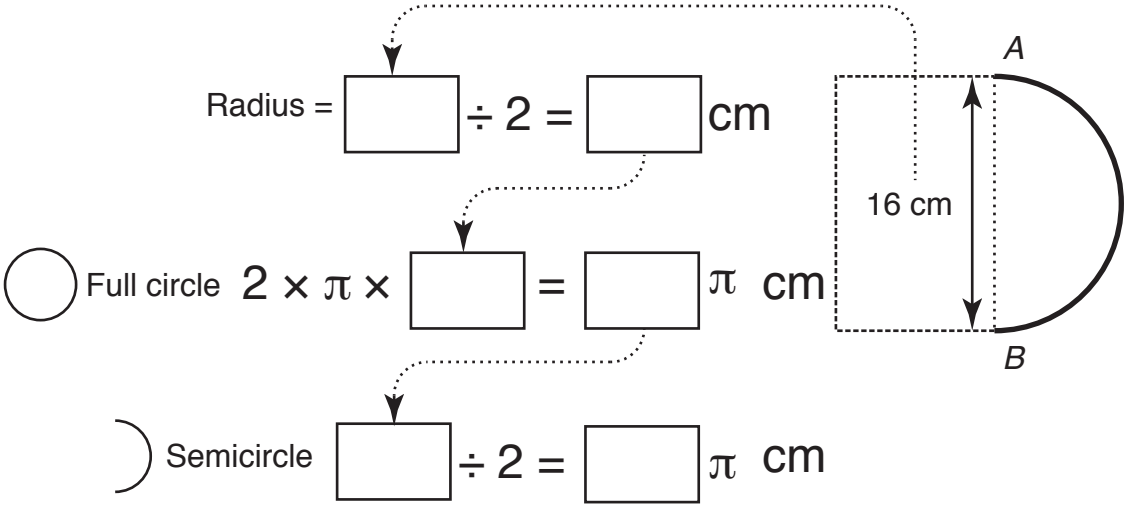
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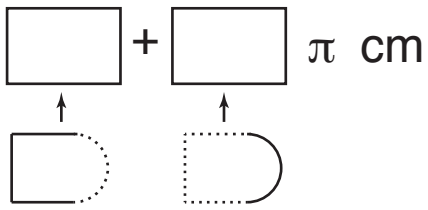
1a The shape has three straight sides.
Write down the total length of the straight sides.

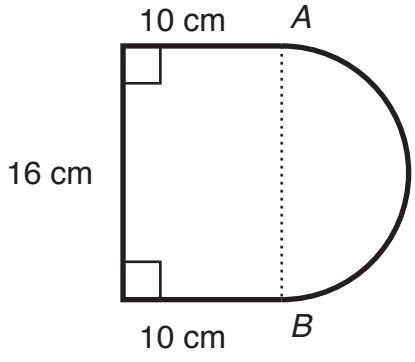


1b At the end of the shape is a semicircle.
AB is the diameter of the semicircle.
Calculate the perimeter of the semicircle.
Give your answer in terms of π.



1c Calculate the perimeter of this shape.
Give your answer in terms of π.





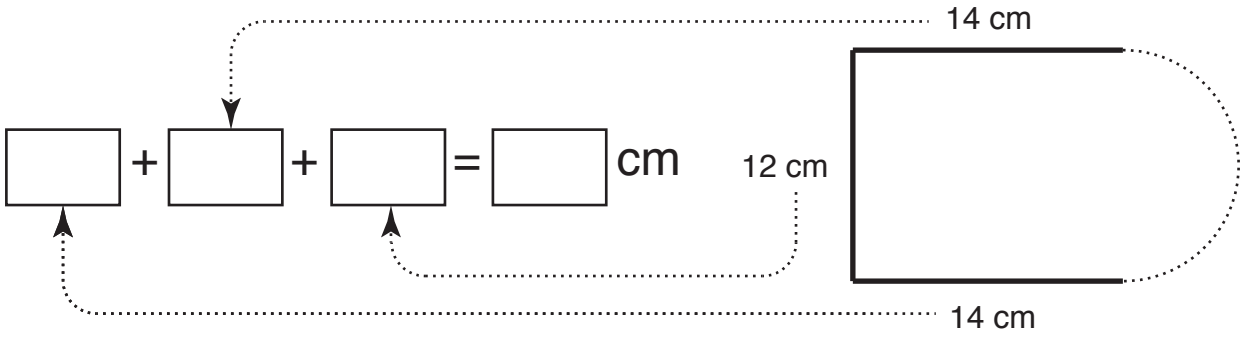
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5.5 Perimeter with a semicircle advanced 2

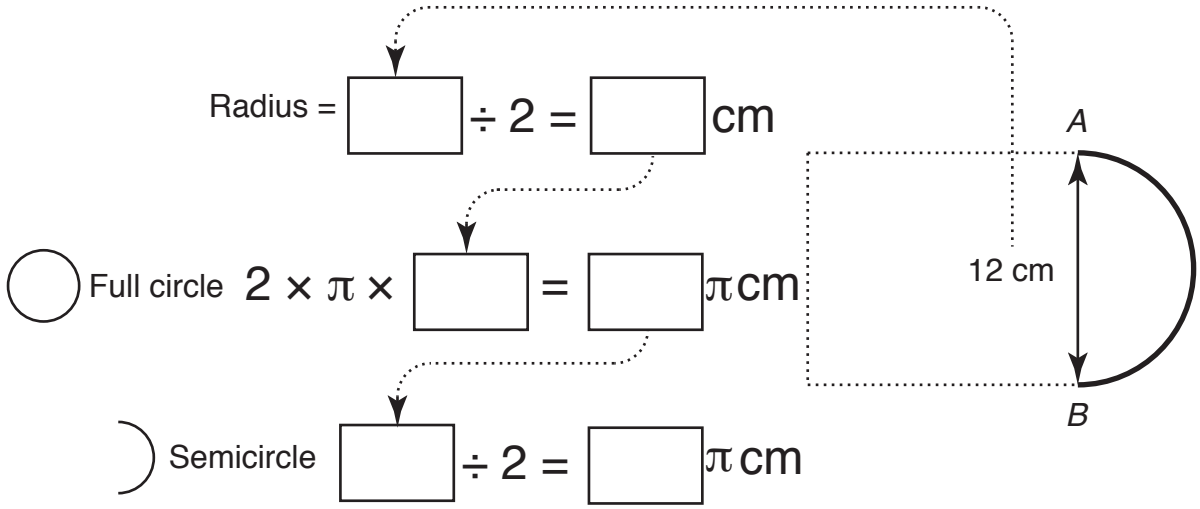
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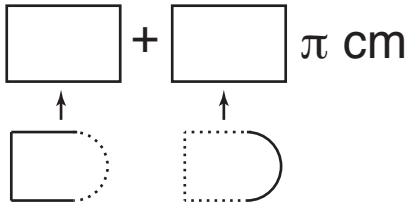
1a The shape has three straight sides.
Write down the total length of the straight sides.

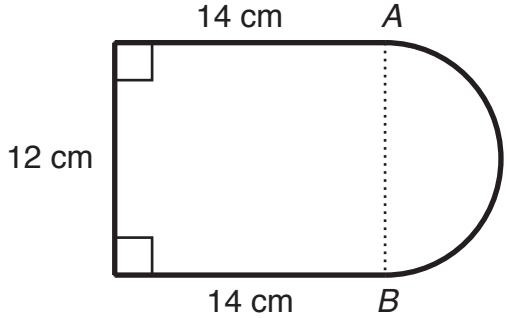


1b At the end of the shape is a semicircle.
AB is the diameter of the semicircle.
Calculate the perimeter of the semicircle.
Give your answer in terms of π.



1c Calculate the perimeter of this shape.
Give your answer in terms of π.





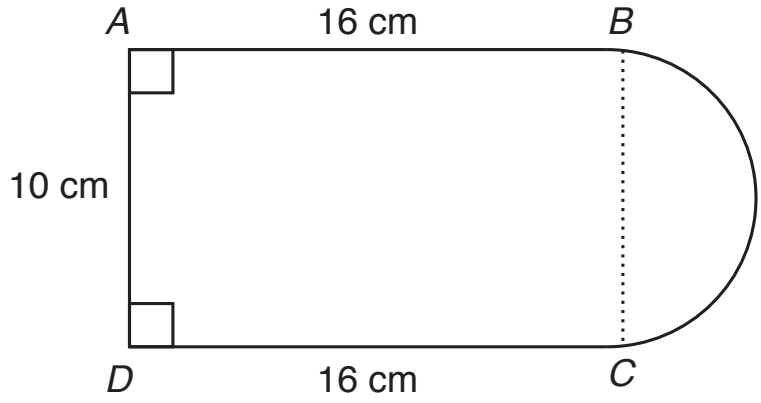
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5.5 Perimeter with a semicircle advanced: Test

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1 The diagram shows a shape made of a rectangle *ABCD* and a semicircle.
BC is the diameter of the semicircle.



Calculate the perimeter of the shape.
Give your answer in terms of π.

Answer _____

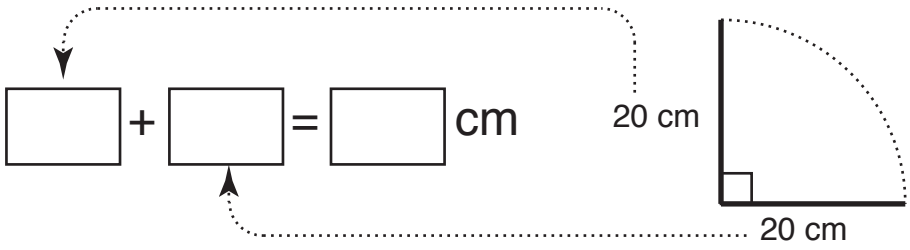
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5.6 Perimeter with arcs introduction 1

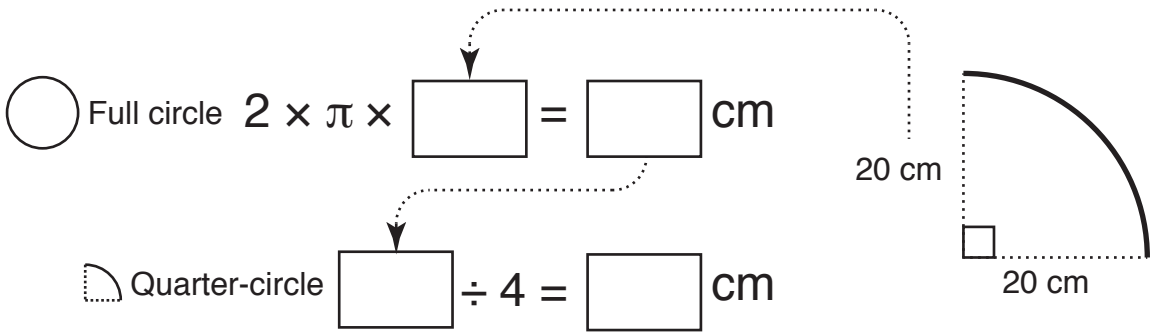
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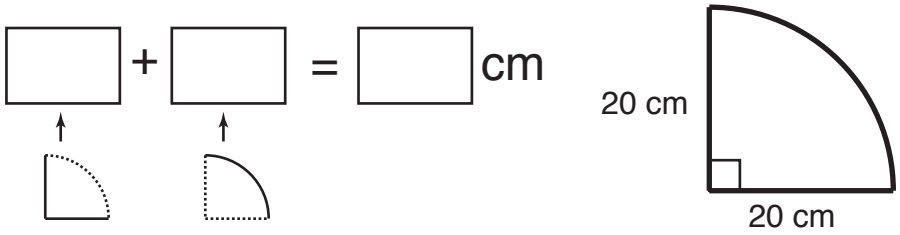
1a The diagram shows a quarter-circle.
Work out the total length of the straight sides.



1b Calculate the perimeter of the quarter-circle.
Give your answer to one place of decimals.



1c Calculate the perimeter of this shape.
Give your answer to one place of decimals.



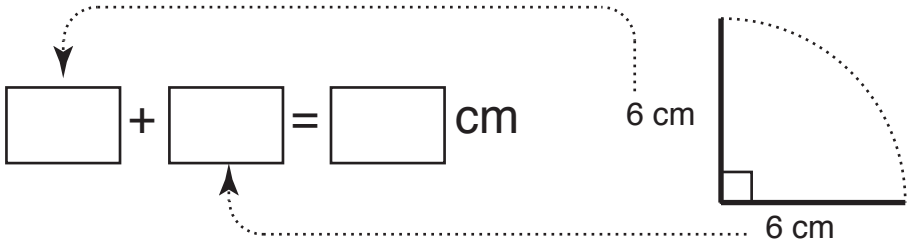
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5.6 Perimeter with arcs introduction 2

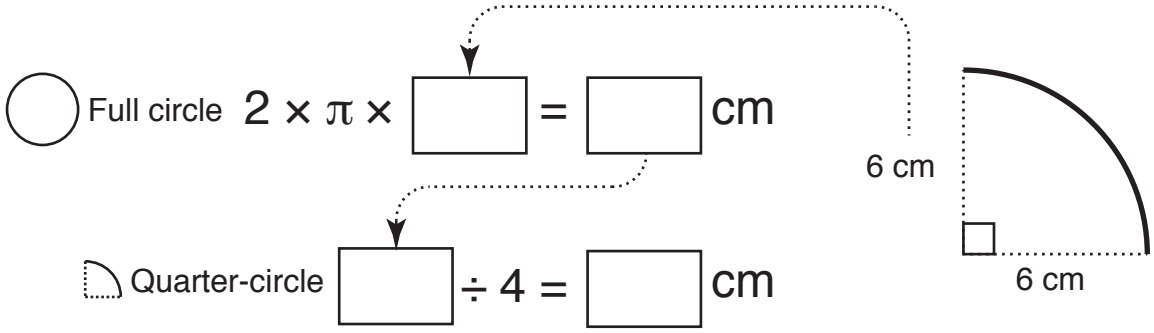
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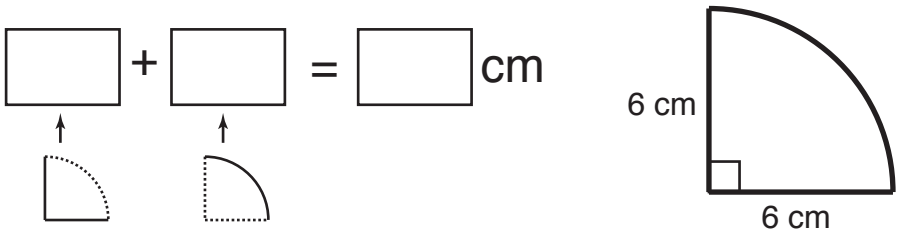
1a The diagram shows a quarter-circle.
Work out the total length of the straight sides.



1b Calculate the perimeter of the quarter-circle.
Give your answer to one place of decimals.



1c Calculate the perimeter of this shape.
Give your answer to one place of decimals.



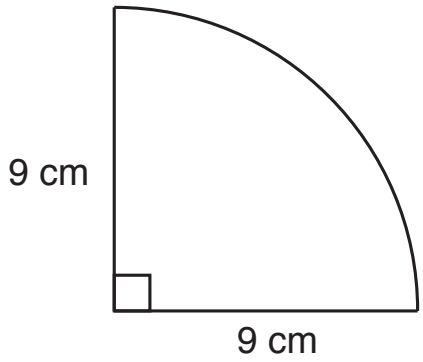
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5.6 Perimeter with arcs introduction: Test

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1 The diagram shows a quarter-circle with a radius of 8cm



Calculate the perimeter of the shape.
Give your answer to one place of decimals.

Answer _____

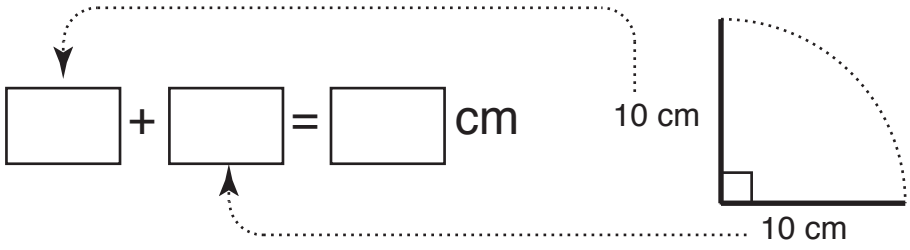
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5.7 Perimeter with arcs next steps 1

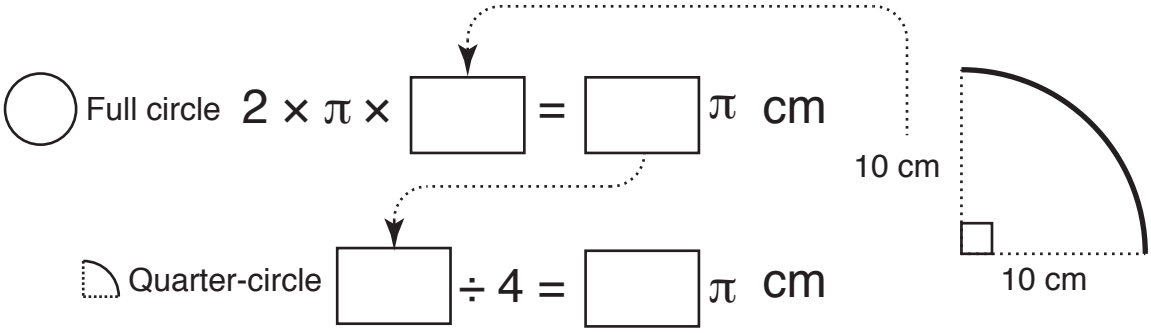
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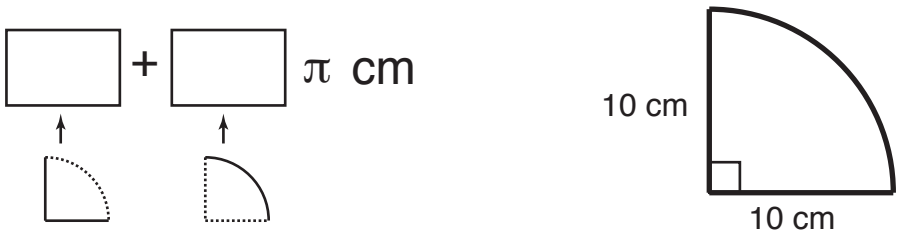
1a The diagram shows a quarter-circle.
Work out the total length of the straight sides.



1b Calculate the perimeter of the quarter-circle.
Give your answer in terms of π.



1c Calculate the perimeter of this shape.
Give your answer to one place of decimals.



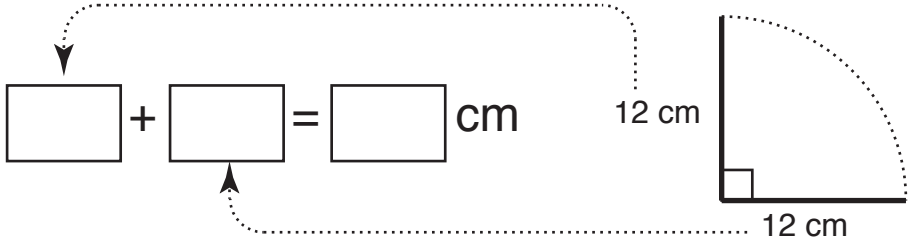
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5.7 Perimeter with arcs next steps 2

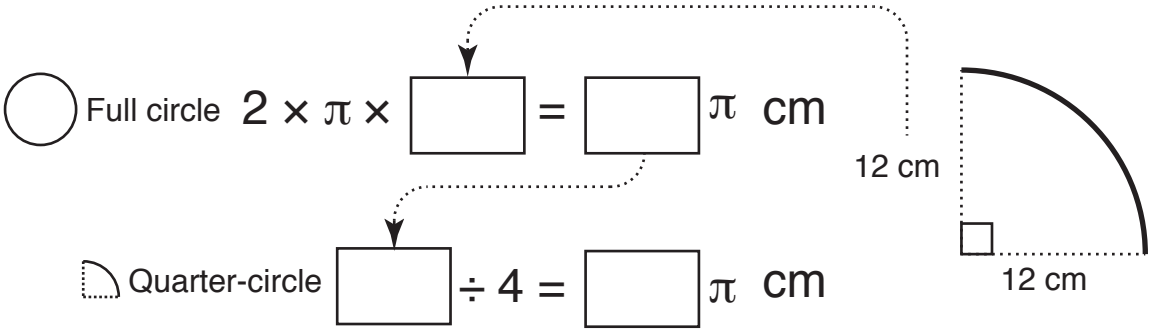
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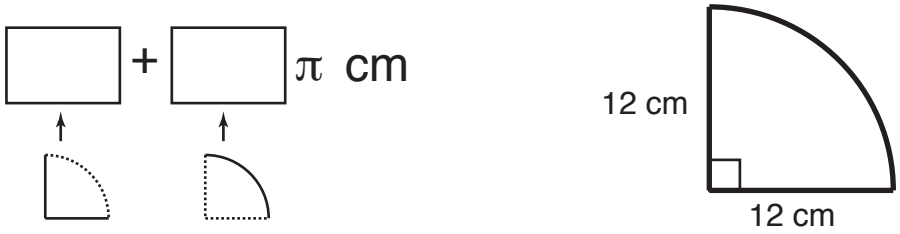
1a The diagram shows a quarter-circle.
Work out the total length of the straight sides.



1b Calculate the perimeter of the quarter-circle.
Give your answer in terms of π.



1c Calculate the perimeter of this shape.
Give your answer in terms of π.



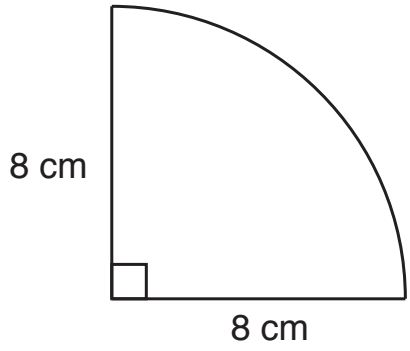
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5.7 Perimeter with arcs next steps: Test

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1 The diagram shows a quarter-circle with a radius of 8cm



Calculate the perimeter of the shape.
Give your answer in terms of π.

Answer _____

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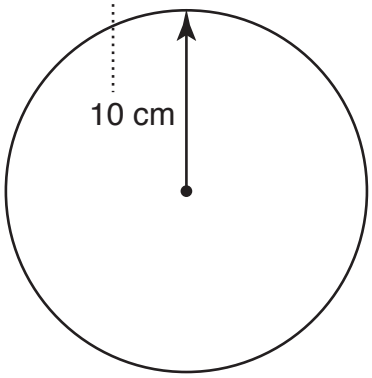
5.8 Perimeter with arcs advanced 1

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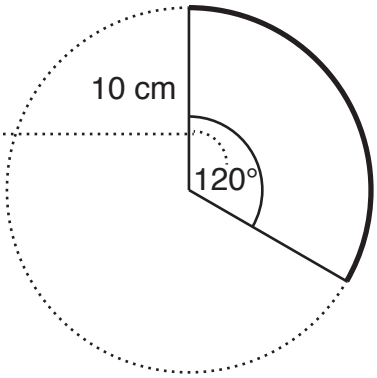
1a The diagram shows a circle with radius 10 cm
Calculate the circumference of the circle.

Full circle $2 \times \pi \times$ ☐ = ☐ cm



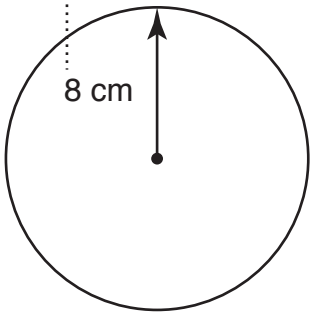
1b The diagram shows a circular arc.
Calculate the length of the arc.

☐ × $\frac{\square}{360}$ = ☐ cm



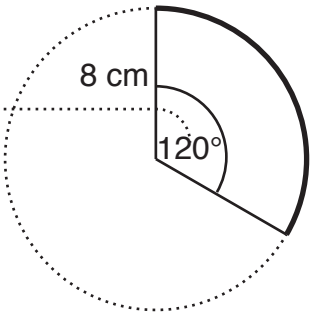
2a The diagram shows a circle with radius 8 cm
Calculate the circumference of the circle.

Full circle $2 \times \pi \times$ ☐ = ☐ cm



2b The diagram shows a circular arc.
Calculate the length of the arc.

☐ × $\frac{\square}{360}$ = ☐ cm



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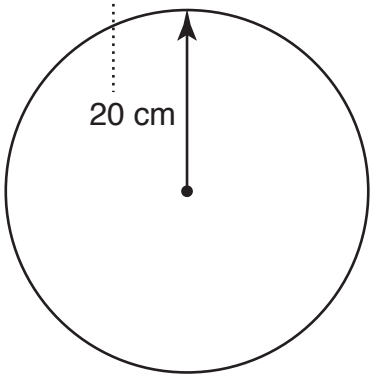
5.8 Perimeter with arcs advanced 2

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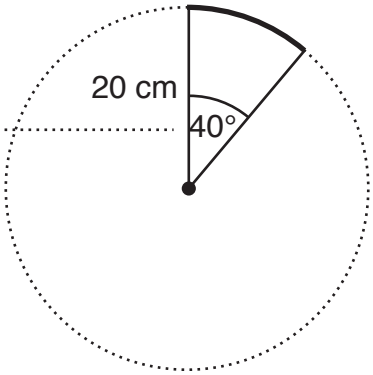
1a The diagram shows a circle with radius 20 cm
Calculate the circumference of the circle.

Full circle $2 \times \pi \times$ ☐ = ☐ cm



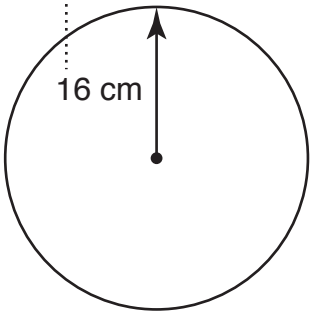
1b The diagram shows a circular arc.
Calculate the length of the arc.

☐ × $\frac{\square}{360}$ = ☐ cm



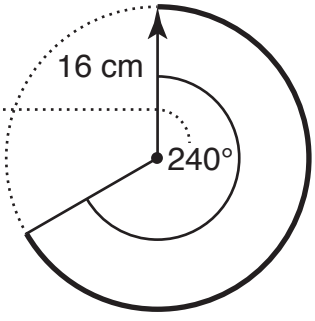
2a The diagram shows a circle with radius 8 cm
Calculate the circumference of the circle.

Full circle $2 \times \pi \times$ ☐ = ☐ cm



2b The diagram shows a circular arc.
Calculate the length of the arc.

☐ × $\frac{\square}{360}$ = ☐ cm



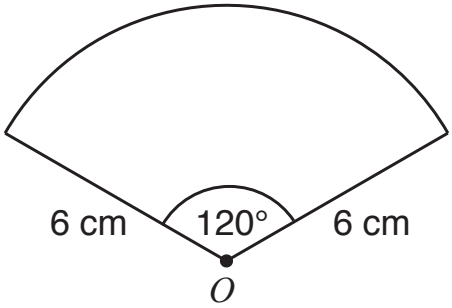
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5.8 Perimeter with arcs advanced: Test

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1 The diagram shows a circular arc with centre O.



Calculate the length of the arc.
Give your answer to one place of decimals.

Answer _____

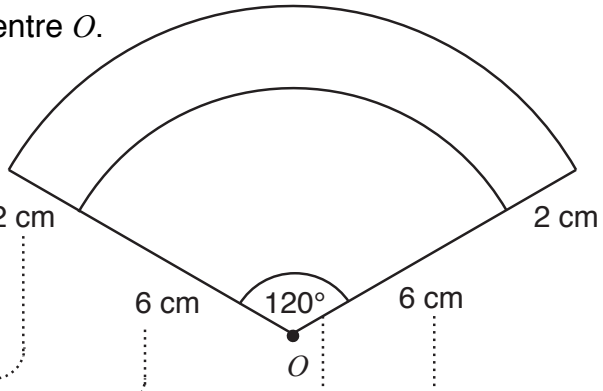
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5.9 Perimeter with arcs extension 1

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1 The diagram shows two circular arcs with centre O.



1a Calculate the length of the big arc.

$\square + \square = \square$

Full circle $2 \times \pi \times \square = \square$ cm

The big arc $\square \times \frac{\square}{360} = \square$ cm

1b Calculate the length of the small arc.

Full circle $2 \times \pi \times \square = \square$ cm

The small arc $\square \times \frac{\square}{360} = \square$ cm

1c How much longer is the big arc than the small arc?
Give your answer to 1 decimal place.

Answer _____

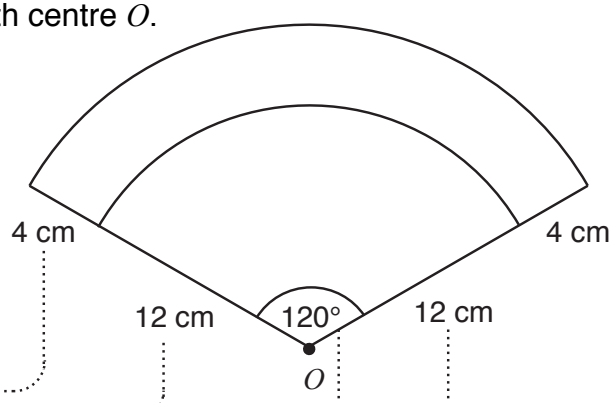
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5.9 Perimeter with arcs extension 2

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1 The diagram shows two circular arcs with centre O.



1a Calculate the length of the big arc.

$\square + \square = \square$

Full circle $2 \times \pi \times \square = \square$ cm

The big arc $\square \times \frac{\square}{360} = \square$ cm

1b Calculate the length of the small arc.

Full circle $2 \times \pi \times \square = \square$ cm

The small arc $\square \times \frac{\square}{360} = \square$ cm

1c How much longer is the big arc than the small arc?
Give your answer to 1 decimal place.

Answer _____

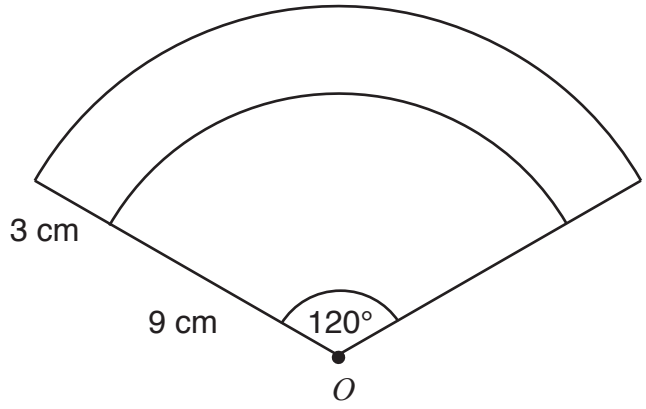
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5.9 Perimeter with arcs extension: Test

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1 The diagram shows two circular arcs with centre O.



How much longer is the big arc than the small arc?
Give your answer to 1 decimal place.

Answer _____

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6 Area

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6.1	Area of compound shapes introduction	252
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6.10	Area with cut outs extension	288

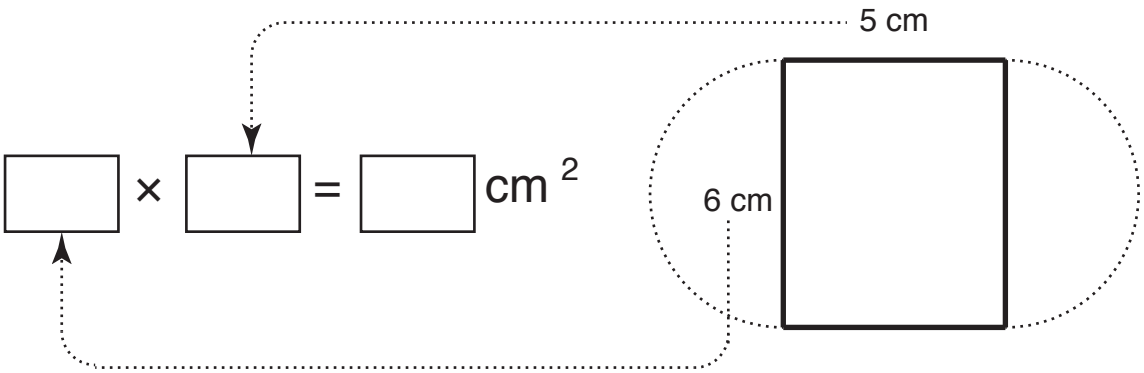
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6.1 Area of Compound Shapes Introduction 1

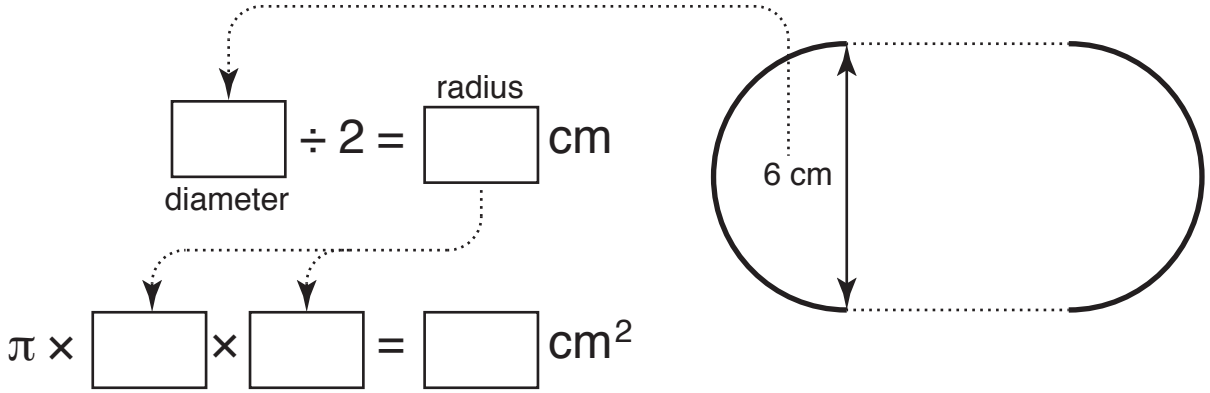
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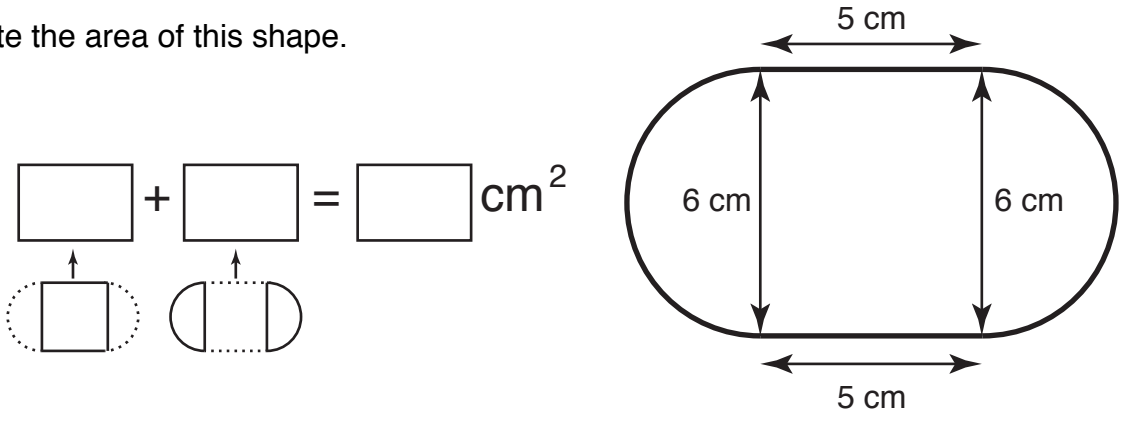
1a The diagram shows a rectangle.
Calculate the area of the rectangle.



1b Each end of the shape is a semicircle of diameter 6 cm.
Calculate the area of the circle.
Give your answer to 1 decimal place.



1c Calculate the area of this shape.



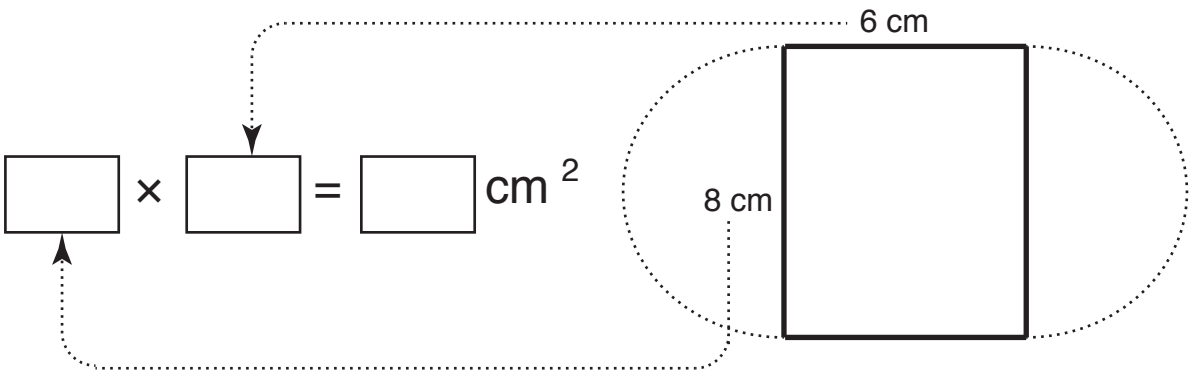
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6.1 Area of Compound Shapes Introduction 2

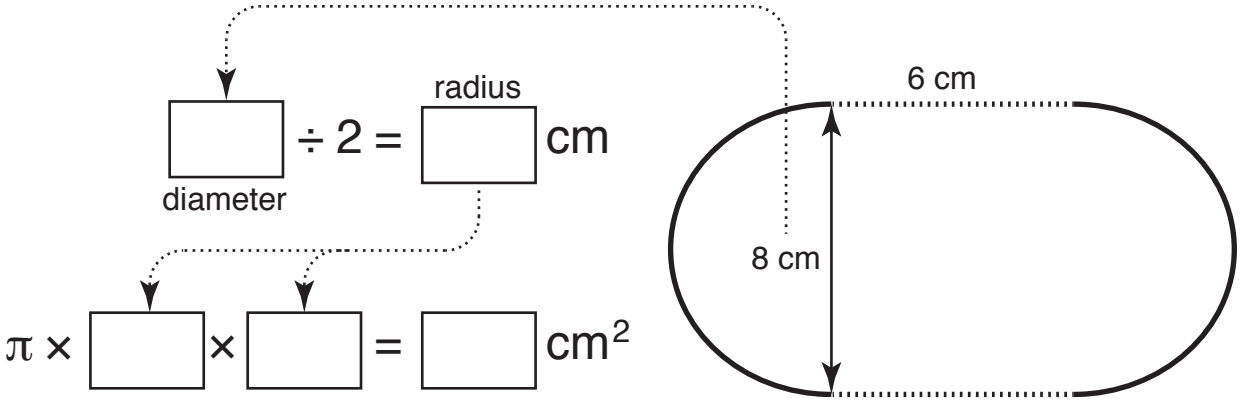
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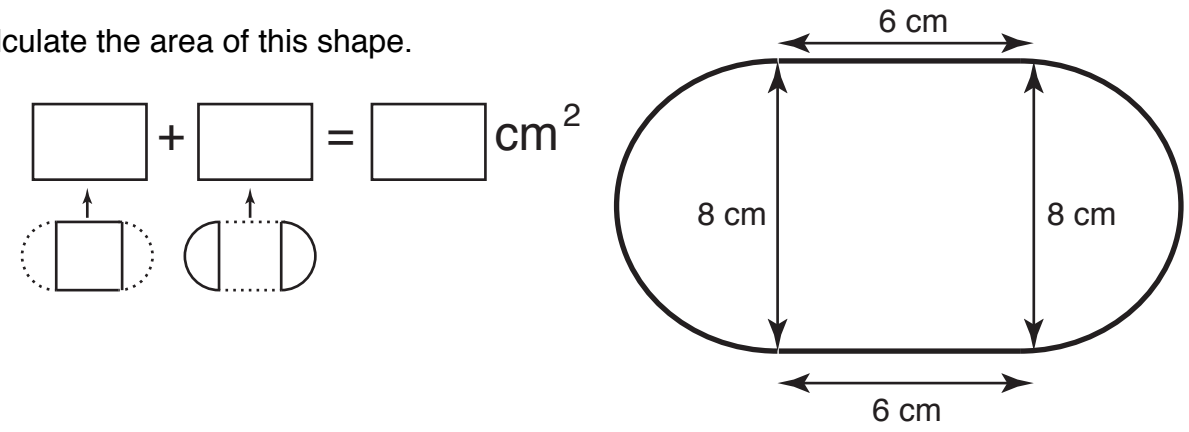
1a The diagram shows a rectangle.
Calculate the area of the rectangle.



1b Each end of the shape is a semicircle of diameter 8 cm.
Calculate the area of the circle.
Give your answer to 1 decimal place.



1c Calculate the area of this shape.



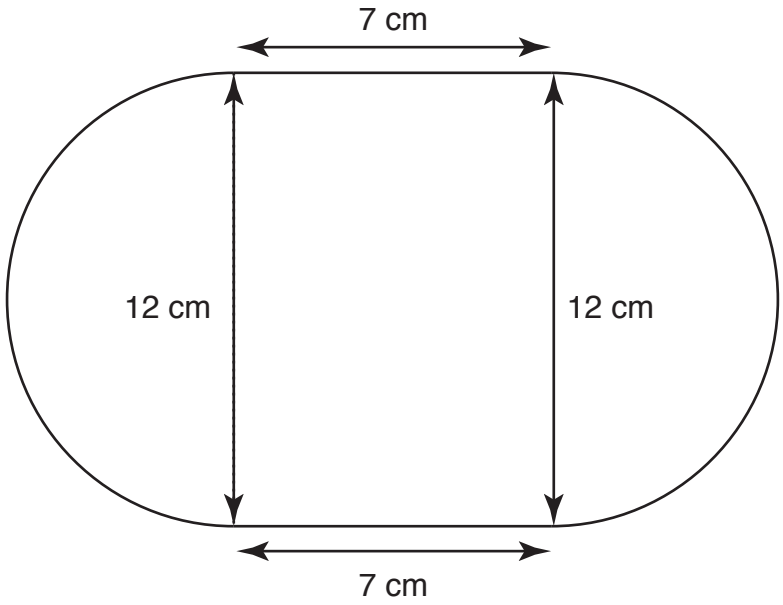
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6.1 Area of Compound Shapes Introduction: Test

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1



The diagram shows a shape made from a rectangle and two semi-circles.
Calculate the area of the shape.
Give your answer to 1 decimal place.

Answer _____

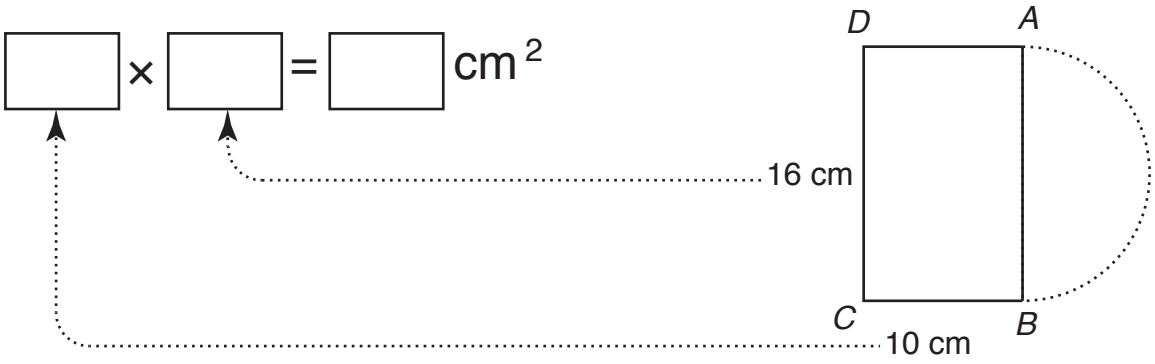
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6.2 Area of Compound Shapes Advanced 1

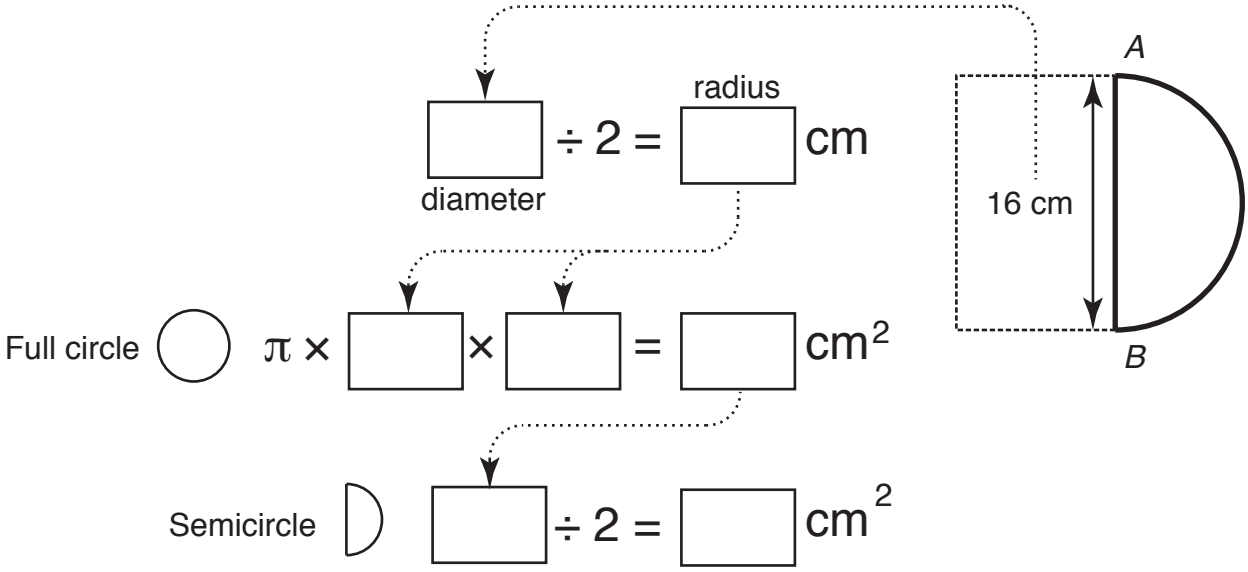
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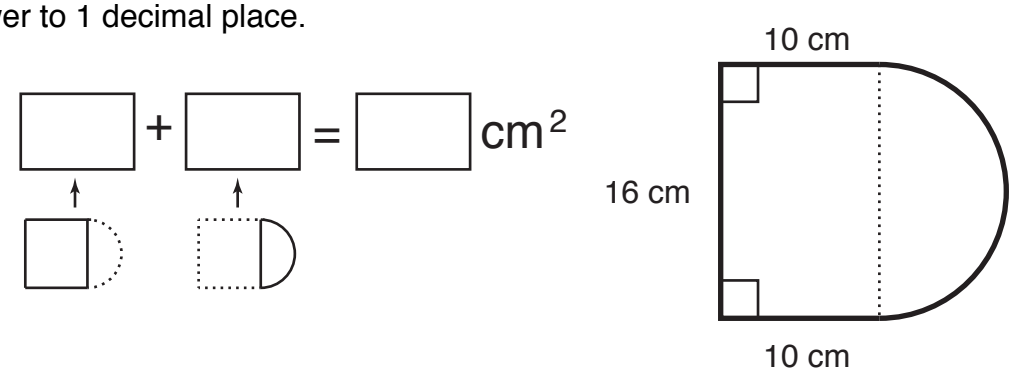
1a Calculate the area of rectangle *ABCD*.



1b At the end of the shape is a semicircle.
AB is the diameter of the semicircle.
Calculate the area of the semicircle.
Give your answer to 1 decimal place.



1c Calculate the area of this shape.
Give your answer to 1 decimal place.



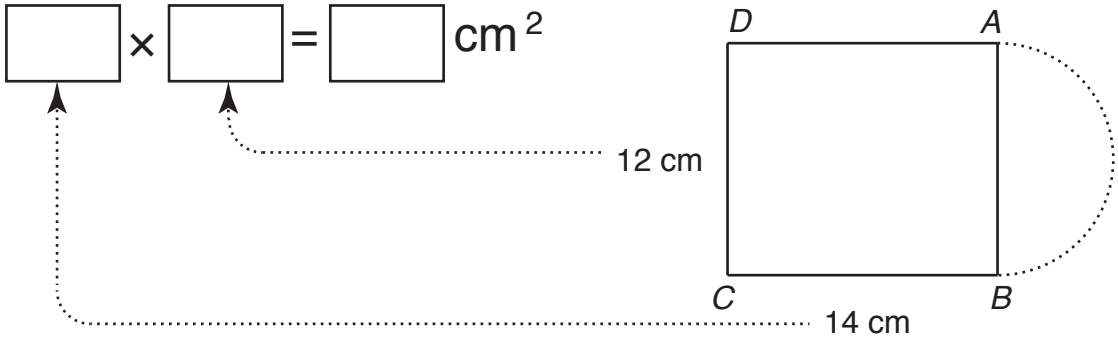
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6.2 Area of Compound Shapes Advanced 2

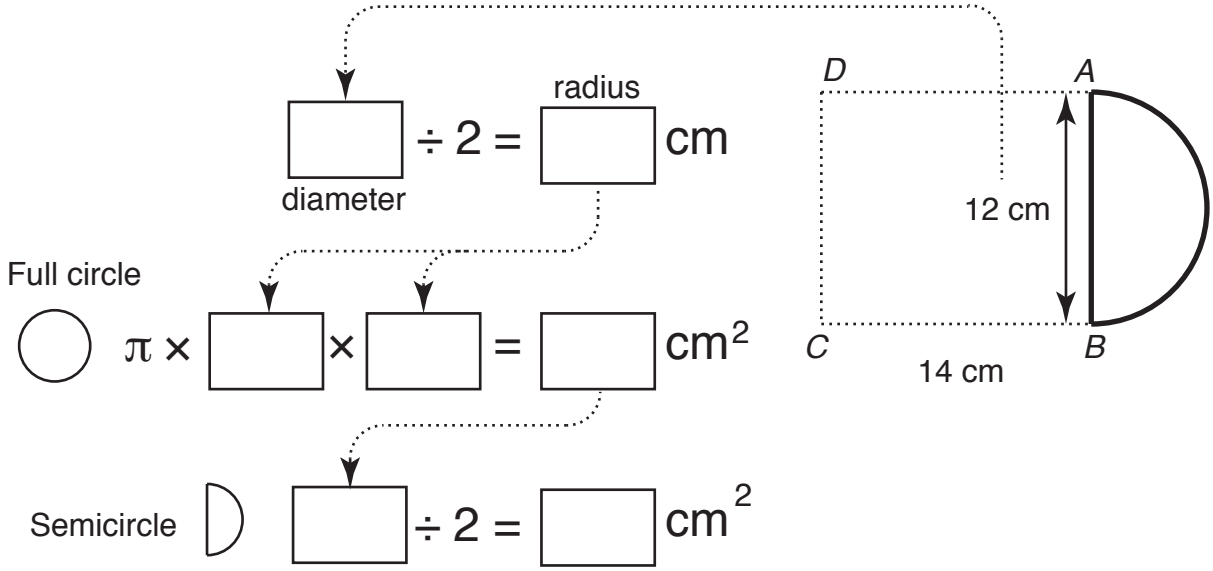
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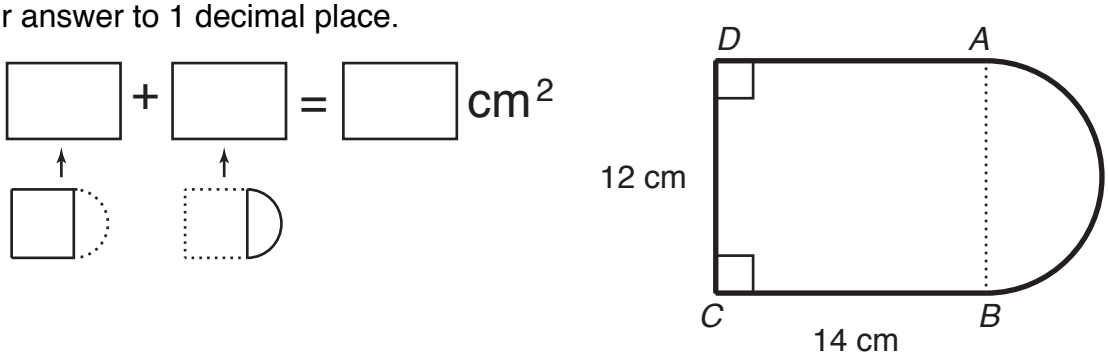
1a Calculate the area of rectangle *ABCD*.



1b At the end of the shape is a semicircle.
AB is the diameter of the semicircle.
Calculate the area of the semicircle.
Give your answer to 1 decimal place.



1c Calculate the area of this shape.
Give your answer to 1 decimal place.



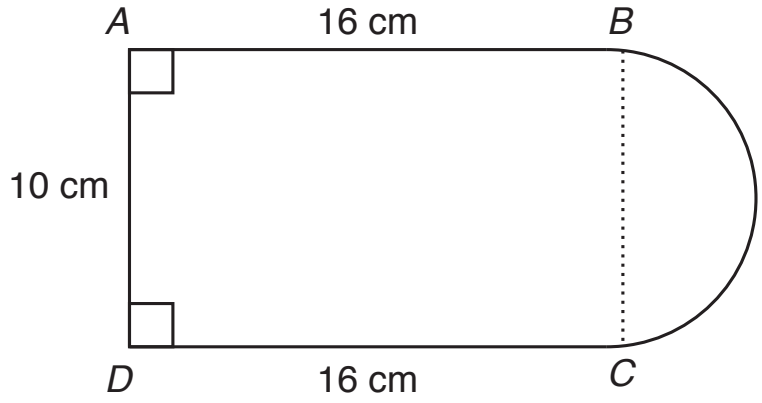
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6.2 Area of Compound Shapes Advanced: Test

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1 The diagram shows a shape made of a rectangle *ABCD* and a semicircle.
BC is the diameter of the semicircle.



Calculate the area of the shape.
Give your answer it 1 decimal place.

Answer _____

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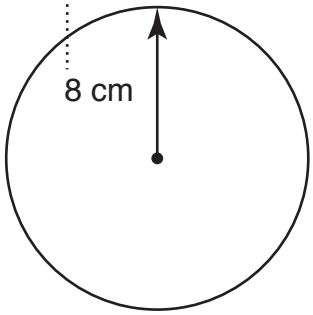
6.3 Area of a sector introduction 1

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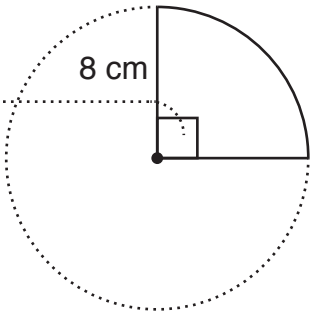
1a The diagram shows a circle with radius 8 cm.
Calculate the area of the circle.

$\pi \times \square \times \square = \square \text{ cm}^2$



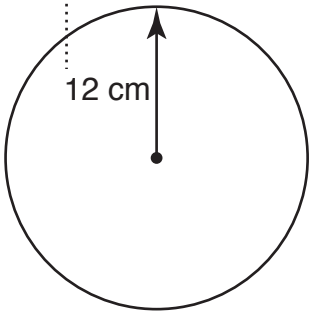
1b The diagram shows a quarter circle.
Calculate the area of the quarter circle.

$\square \times \frac{\square}{360} = \square \text{ cm}^2$



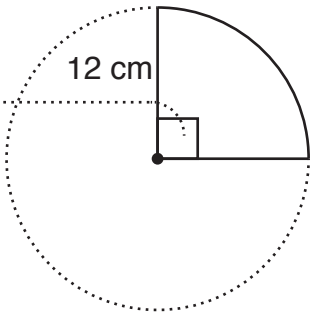
2a The diagram shows a circle with radius 12 cm.
Calculate the area of the circle.

$\pi \times \square \times \square = \square \text{ cm}^2$



2b The diagram shows a quarter circle.
Calculate the area of the quarter circle.

$\square \times \frac{\square}{360} = \square \text{ cm}^2$



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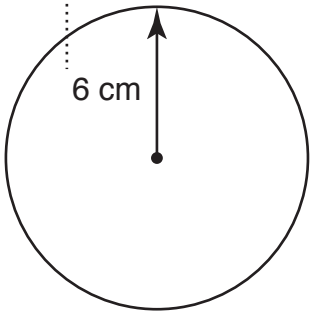
6.3 Area of a sector introduction 2

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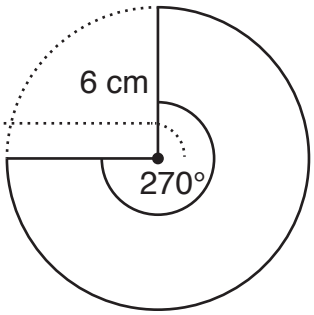
1a The diagram shows a circle with radius 6 cm.
Calculate the area of the circle.

$\pi \times \square \times \square = \square \text{ cm}^2$



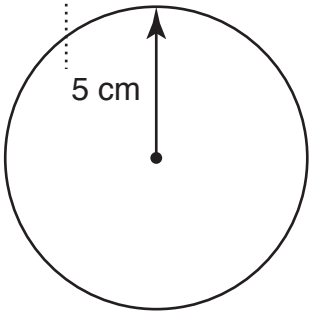
1b The diagram shows a three-quarters of a circle.
Calculate the area of the shape.

$\square \times \frac{\square}{360} = \square \text{ cm}^2$



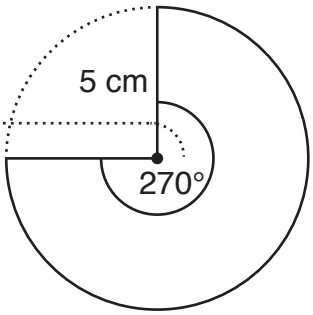
2a The diagram shows a circle with radius 5 cm.
Calculate the area of the circle.

$\pi \times \square \times \square = \square \text{ cm}^2$



2b The diagram shows a quarter circle.
Calculate the area of the quarter circle.

$\square \times \frac{\square}{360} = \square \text{ cm}^2$



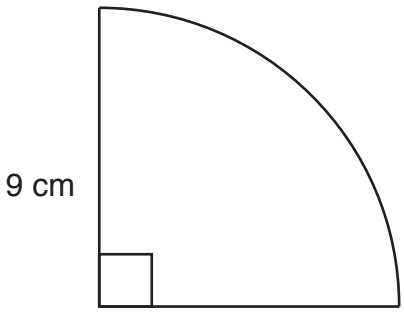
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6.3 Area of a sector introduction: Test

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1 The diagram shows a quarter-circle with radius 9 cm.



Work out the area of the quarter-circle.

Answer _____

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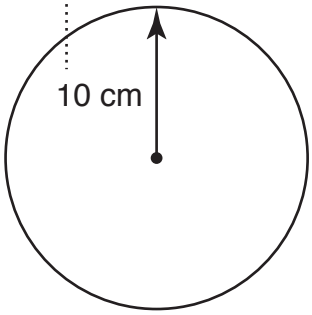
6.4 Area of a sector next steps 1

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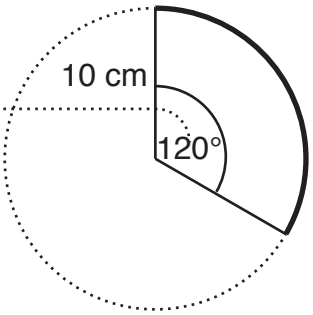
1a The diagram shows a circle with radius 10cm.
Calculate the area of the circle.

$\pi \times \square \times \square = \square \text{ cm}^2$



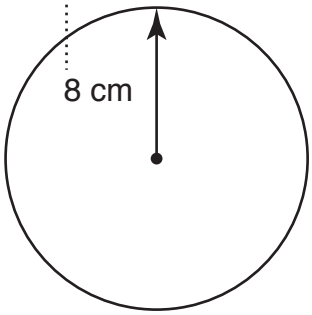
1b The diagram shows a sector of a circle.
Calculate the area of the sector.

$\square \times \frac{\square}{360} = \square \text{ cm}^2$



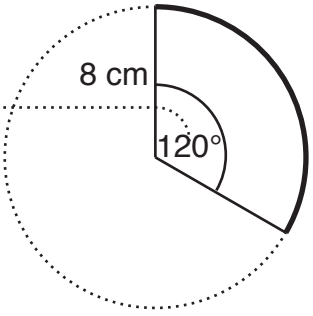
2a The diagram shows a circle with radius 8 cm.
Calculate the area of the circle.

$\pi \times \square \times \square = \square \text{ cm}^2$



2b The diagram shows a sector of a circle.
Calculate the area of the sector.

$\square \times \frac{\square}{360} = \square \text{ cm}^2$



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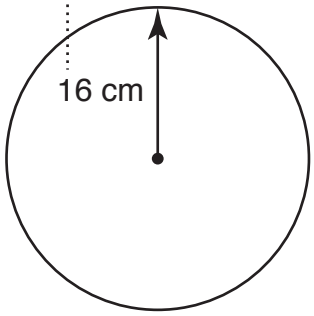
6.4 Area of a sector next steps 2

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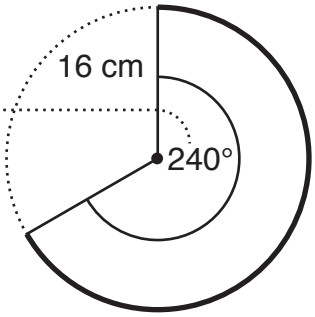
1a The diagram shows a circle with radius 16cm.
Calculate the area of the circle.

$\pi \times \square \times \square = \square \text{ cm}^2$



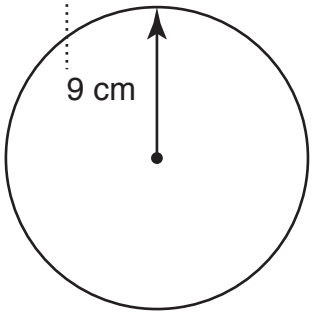
1b The diagram shows a sector of a circle.
Calculate the area of the sector.

$\square \times \frac{\square}{360} = \square \text{ cm}^2$



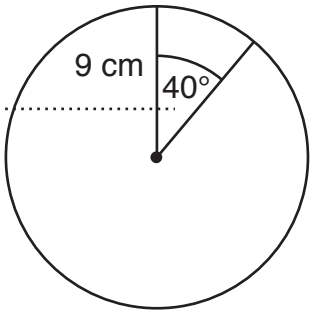
2a The diagram shows a circle with radius 9 cm.
Calculate the area of the circle.

$\pi \times \square \times \square = \square \text{ cm}^2$



2b The diagram shows a sector of a circle.
Calculate the area of the sector.

$\square \times \frac{\square}{360} = \square \text{ cm}^2$



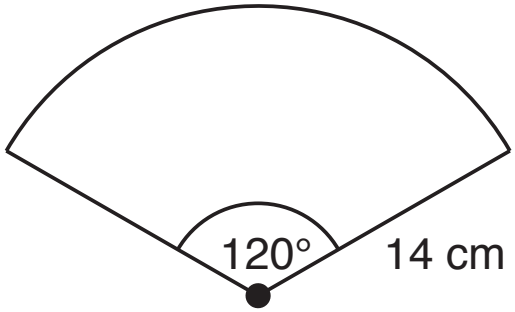
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6.4 Area of a sector next steps: Test

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1 The diagram shows a sector of a circle.



Calculate the area of the sector.

Answer _____

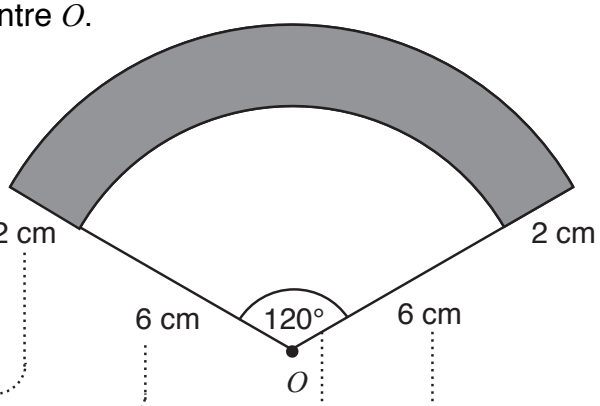
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6.5 Area of a sector advanced 1

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1 The diagram shows two circular arcs with centre O.



1a Calculate the area enclosed by the straight lines and the big arc.
Give your answer to 1 decimal place.

$\square + \square = \square$

Full circle $\pi \times \square \times \square = \square$ cm^2

$\square \times \frac{\square}{360} = \square$ cm^2

1b Calculate the area enclosed by the straight lines and the smaller arc.
Give your answer to 1 decimal place.

Full circle $\pi \times \square \times \square = \square$ cm^2

$\square \times \frac{\square}{360} = \square$ cm^2

1c Calculate the shaded area.
Give your answer to 1 decimal place.

Answer _____

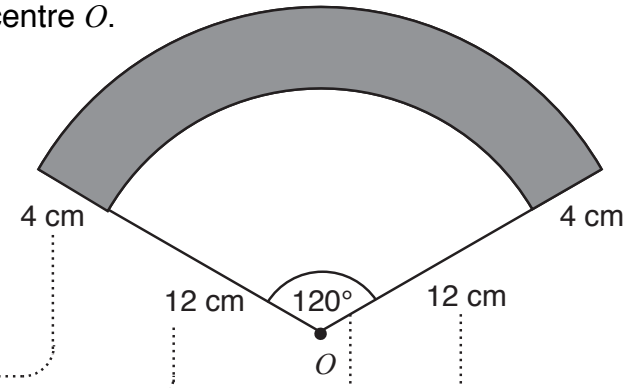
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6.5 Area of a sector advanced 2

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1 The diagram shows two circular arcs with centre O.



1a Calculate the area enclosed by the straight lines and the big arc.
Give your answer to 1 decimal place.

$\square + \square = \square$

Full circle $\pi \times \square \times \square = \square$ cm^2

$\square \times \frac{\square}{360} = \square$ cm^2

1b Calculate the area enclosed by the straight lines and the smaller arc.
Give your answer to 1 decimal place.

Full circle $\pi \times \square \times \square = \square$ cm^2

$\square \times \frac{\square}{360} = \square$ cm^2

1c Calculate the shaded area.
Give your answer to 1 decimal place.

Answer _____

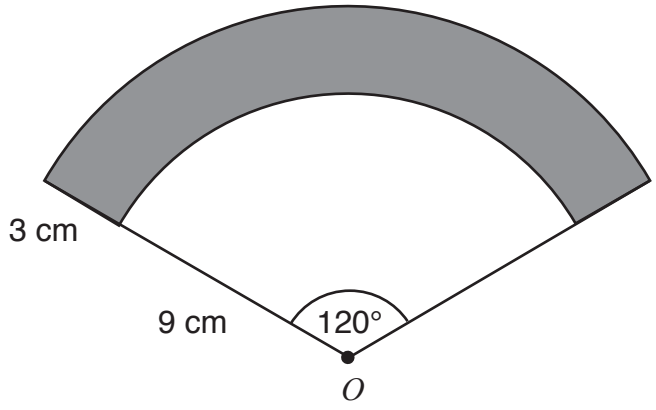
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6.5 Area of a sector advanced: Test

F/H

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1 The diagram shows two circular arcs with centre O.



Calculate the shaded area.
Give your answer to 1 decimal place.

Answer _____

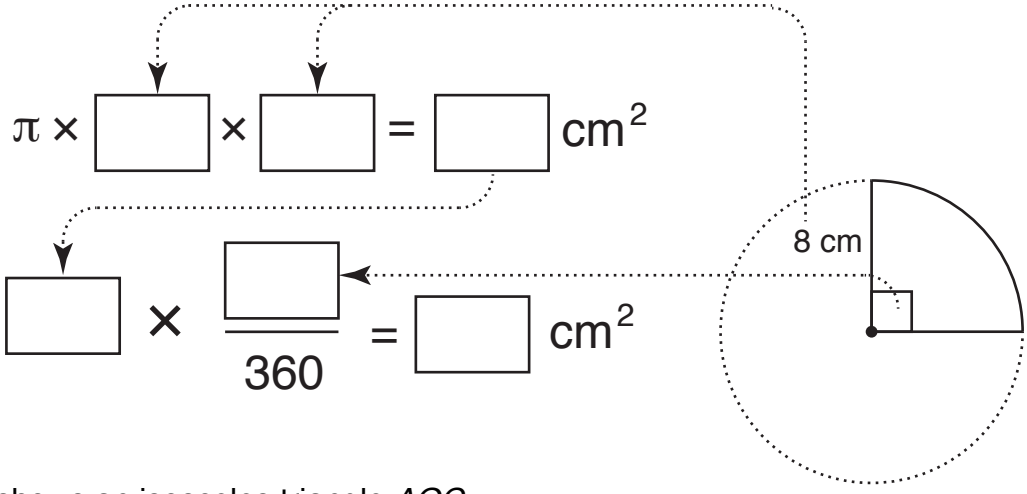
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6.6 Area of a Sector Extension 1

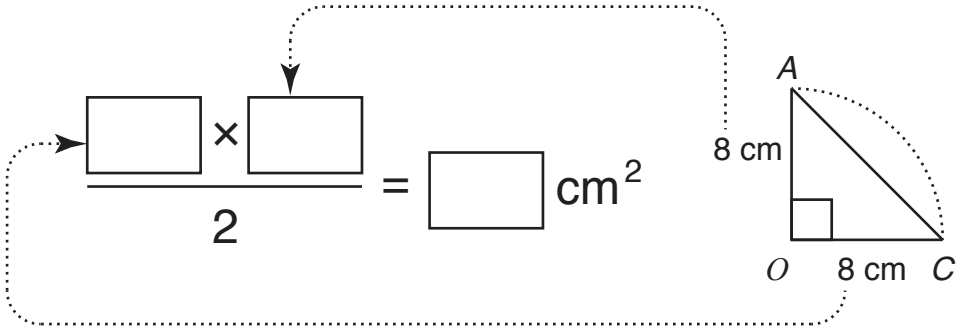
F/H

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1a The diagram shows a quarter-circle with radius 8 cm
Calculate the area of the quarter circle.

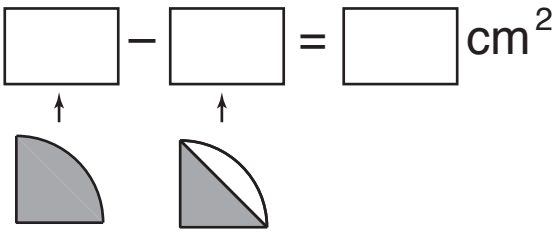


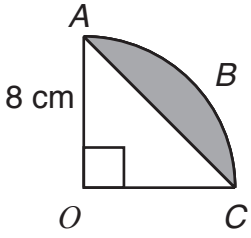
1b The diagram shows an isosceles triangle *AOC*.
Calculate the area of the triangle.



1c The arc *ABC* is a quarter of a circle with centre O and radius 8 cm.
AC is a chord of the circle.

Work out the area of the shaded segment.
Give your answer to 1 decimal place.





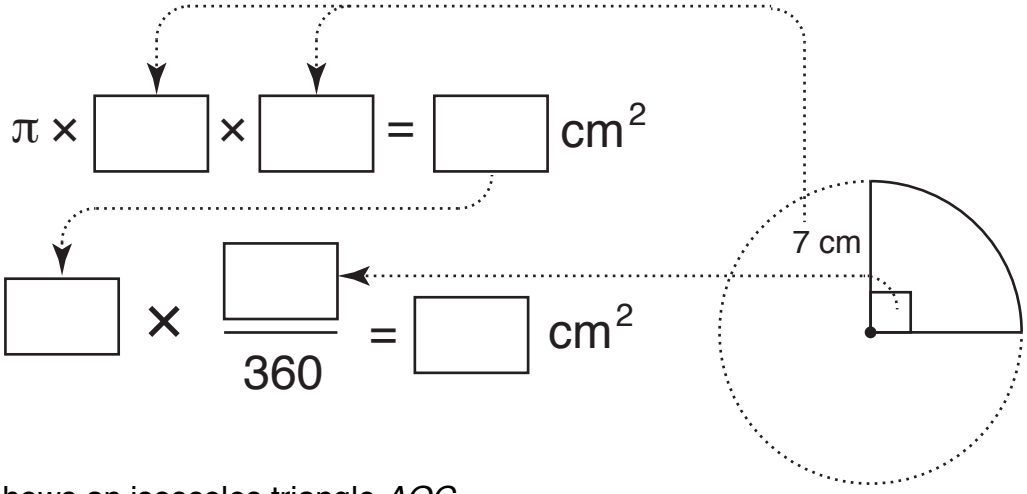
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6.6 Area of a Sector Extension 2

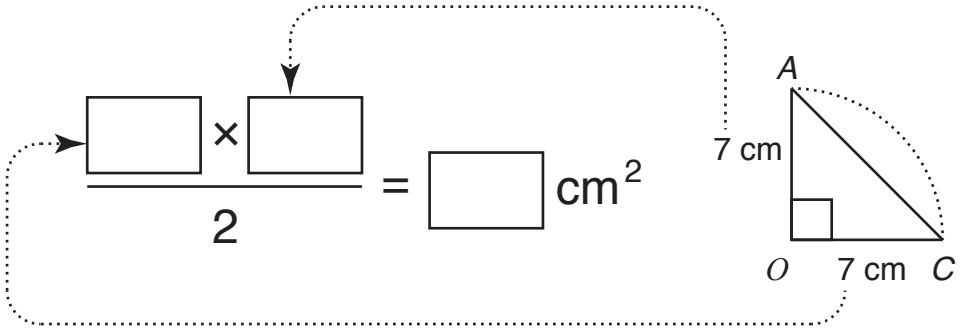
F/H

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1a The diagram shows a quarter-circle with radius 7 cm
Calculate the area of the quarter circle.

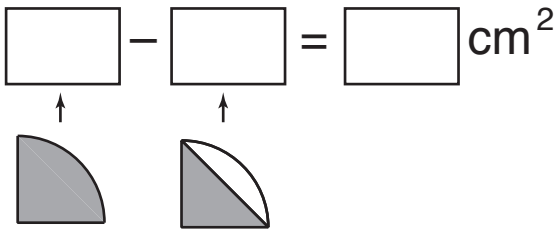


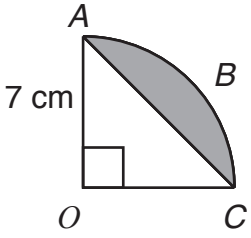
1b The diagram shows an isosceles triangle *AOC*.
Calculate the area of the triangle.



1c The arc *ABC* is a quarter of a circle with centre O and radius 7 cm.
AC is a chord of the circle.

Work out the area of the shaded segment.
Give your answer to 1 decimal place.





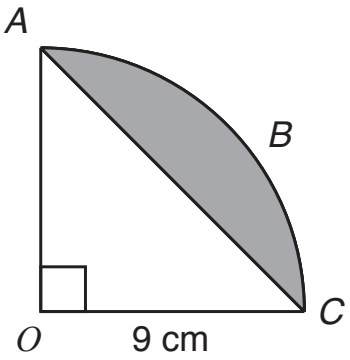
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6.6 Area of a Sector Extension: Test

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1



The arc *ABC* is a quarter of a circle with centre O and radius 9 cm.
AC is a chord of the circle.

Work out the area of the shaded segment.
Give your answer to 1 decimal place.

Answer _____

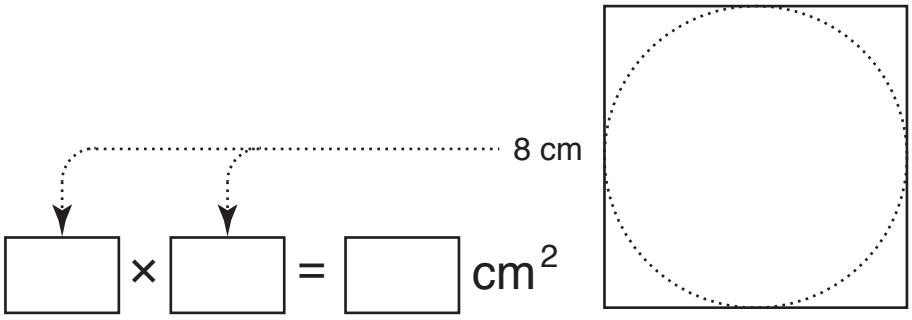
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6.7 Area with cut outs introduction 1

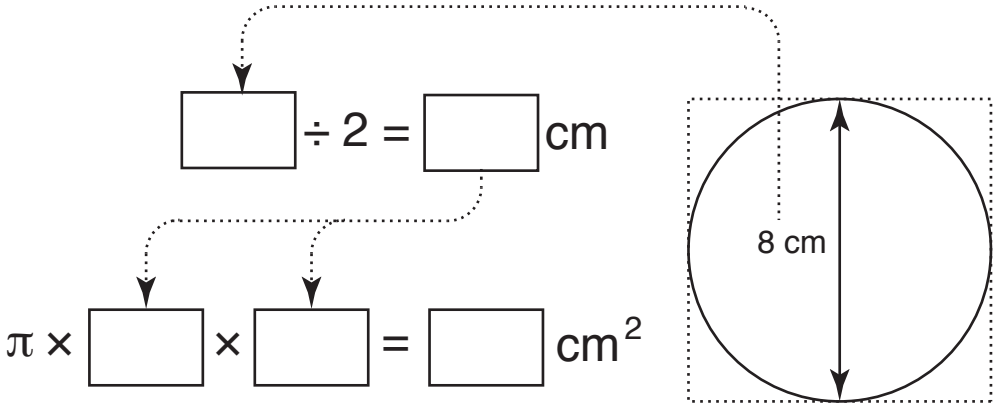
F/H

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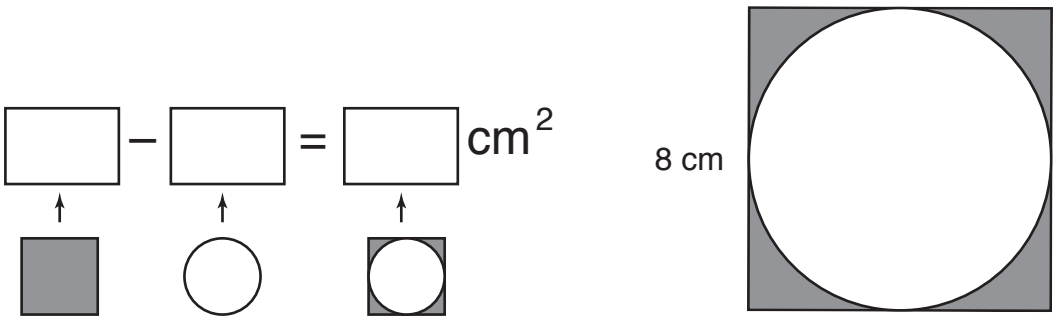
1a The diagram shows a square with side 8 cm.
Calculate the area of the square.



1b The diagram shows a circle of diameter 8 cm.
Calculate the area of the circle.



1c The diagram shows a circle of diameter 8 cm inside a square.
Calculate the shaded area.



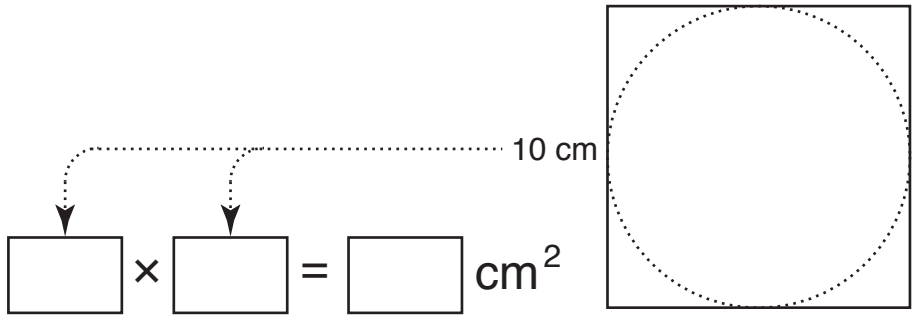
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6.7 Area with cut outs introduction 2

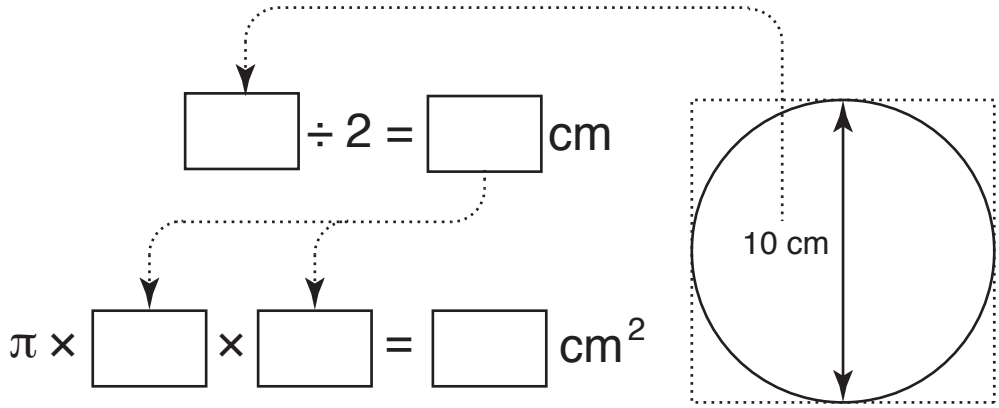
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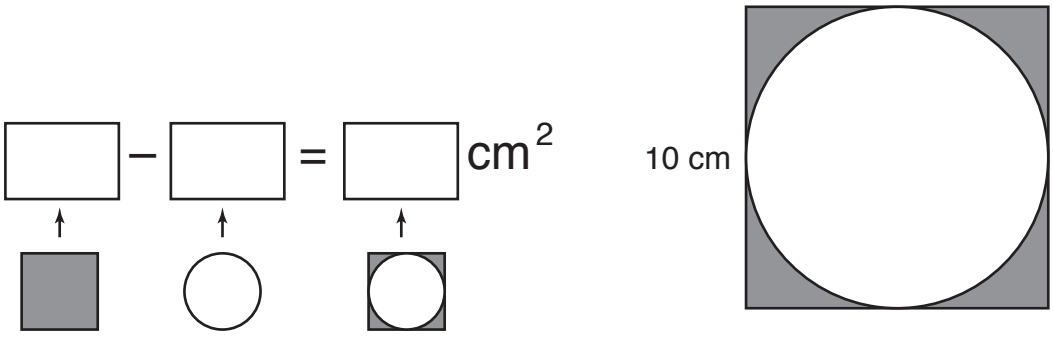
1a The diagram shows a square with side 10 cm.
Calculate the area of the square.



1b The diagram shows a circle of diameter 10 cm.
Calculate the area of the circle.



1c The diagram shows a circle of diameter 10 cm inside a square.
Calculate the shaded area.



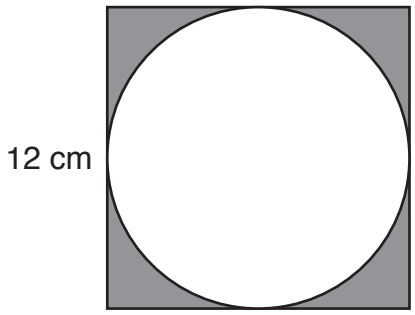
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6.7 Area with cut outs introduction: Test

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1 The diagram shows a circle of diameter 12 cm inside a square.



Work out the shaded area.

Answer _____

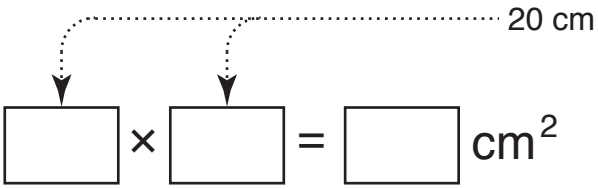
© *Toticity Limited*

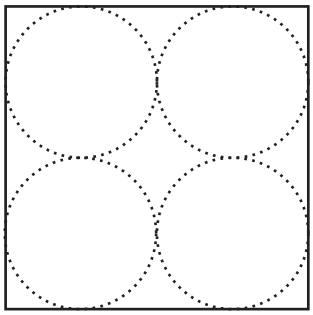
6.8 Area with cut outs next steps 1

F/H

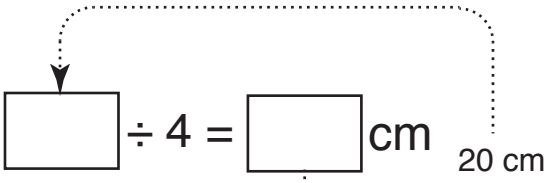
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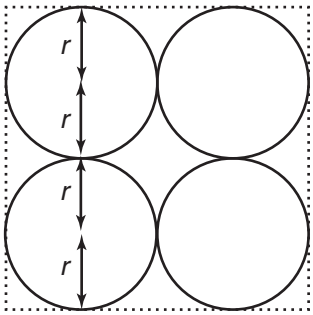
1a The diagram shows a square with side 20 cm.
Calculate the area of the square.



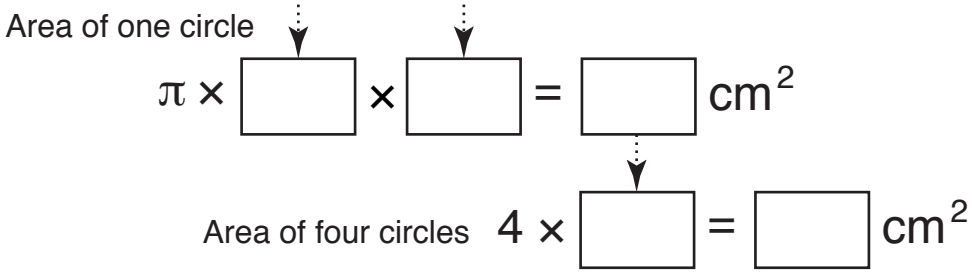


1b Four identical circles just fit inside a square as shown.
Calculate the radius for one of the circles.

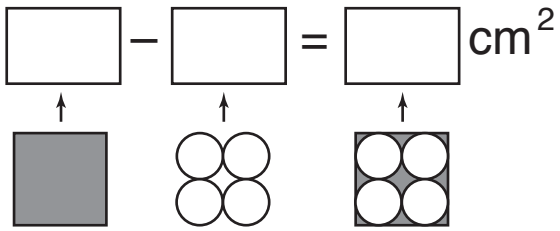


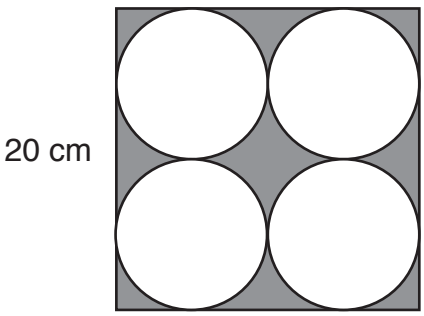


1c Calculate the area of the four circles.



1d Four identical circles just fit inside the square as shown.
Work out the area of the shaded section.





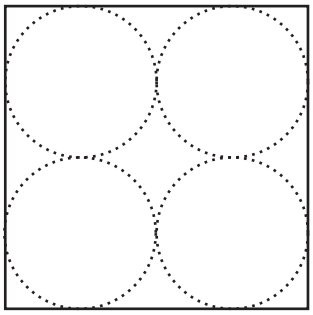
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6.8 Area with cut outs next steps 2

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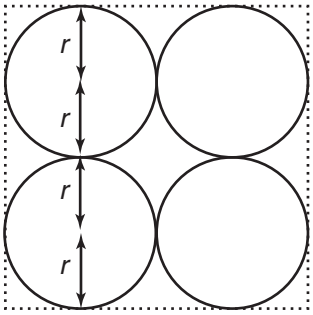
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1a The diagram shows a square with side 8 cm.
Calculate the area of the square.



□ × □ = □ cm²

1b Four identical circles just fit inside a square as shown.
Calculate the radius for one of the circles.



□ ÷ 4 = □ cm

1c Calculate the area of the four circles.

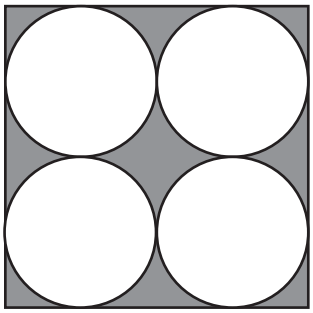
Area of one circle

π × □ × □ = □ cm²

Area of four circles 4 × □ = □ cm²

1d Four identical circles just fit inside the square as shown.
Work out the area of the shaded section.

□ − □ = □ cm²



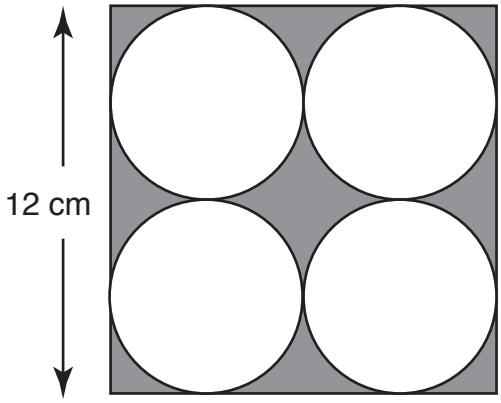
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6.8 Area with cut outs next steps: Test

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1 Four identical circles just fit inside the square as shown.



Work out the area of the shaded section.
Give your answer to 1 decimal place.

Answer _____

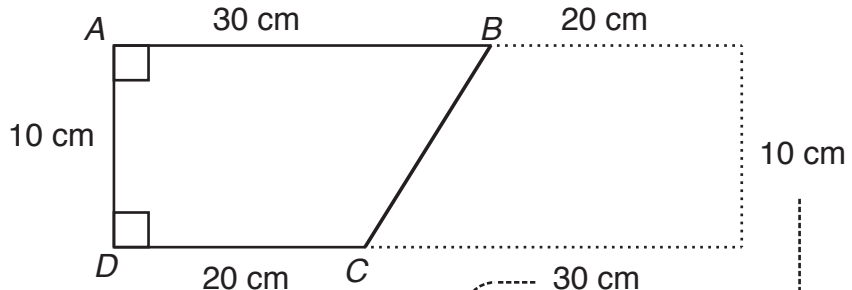
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6.9 Area with cut outs advanced 1

F/H

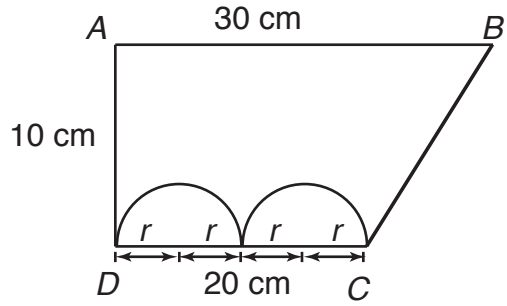
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1a The diagram shows a trapezium *ABCD*.
Work out the area of the trapezium.



$$\frac{(\square + \square) \times \square}{2} = \square \text{ cm}^2$$

1b The diagram shows a trapezium *ABCD* with two identical semicircles.
The centre of each semicircle is on the line *DC*.
Calculate the radius of each semicircle.

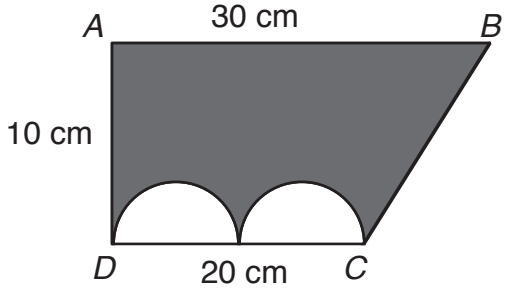


$$\square \div 4 = \square \text{ cm}$$

1c Calculate the area of the two semicircles. $\pi \times \square \times \square = \square \text{ cm}^2$

1d Work out the area of the shaded region.
Give your answer to 1 decimal place.

$$\square - \square = \square \text{ cm}^2$$



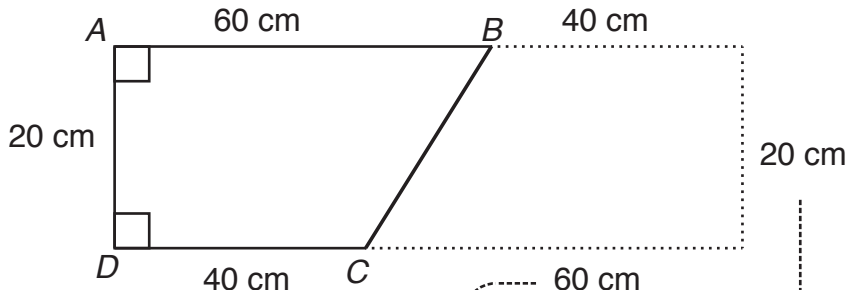
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6.9 Area with cut outs advanced 2

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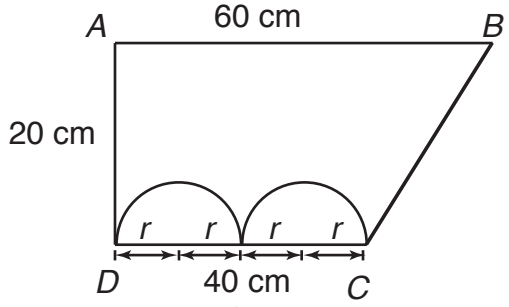
1a The diagram shows a trapezium *ABCD*.
Work out the area of the trapezium.



$$\frac{(\square + \square) \times \square}{2} = \square \text{ cm}^2$$

1b The diagram shows a trapezium *ABCD* with two identical semicircles.
The centre of each semicircle is on the line *DC*.
Calculate the radius of each semicircle.

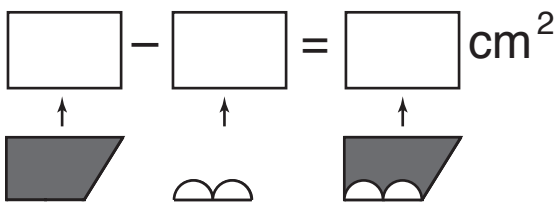
$\square \div 4 = \square$ cm

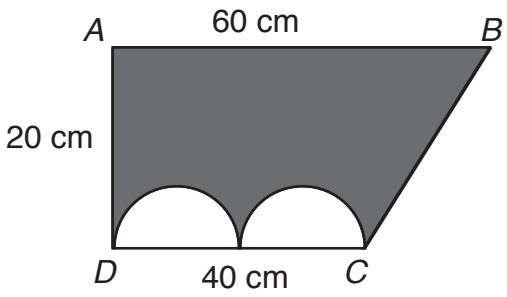


1c Calculate the area of the two semicircles. $\pi \times \square \times \square = \square$ cm^2

1d Work out the area of the shaded region.
Give your answer to 1 decimal place.

$\square - \square = \square$ cm^2





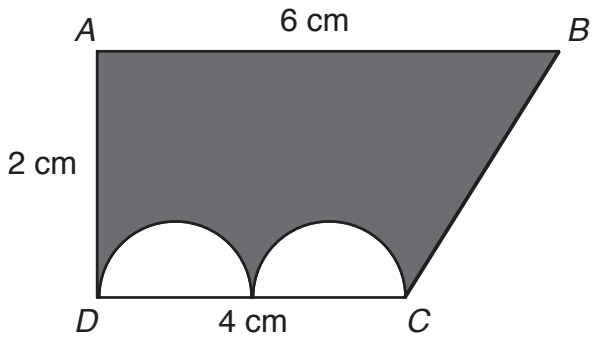
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6.9 Area with cut outs advanced: Test

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1 The diagram shows a trapezium *ABCD* with two identical semicircles.



The centre of each semicircle is on the line DC.
Work out the area of the shaded region.
Give your answer to 1 decimal place.

Answer _____

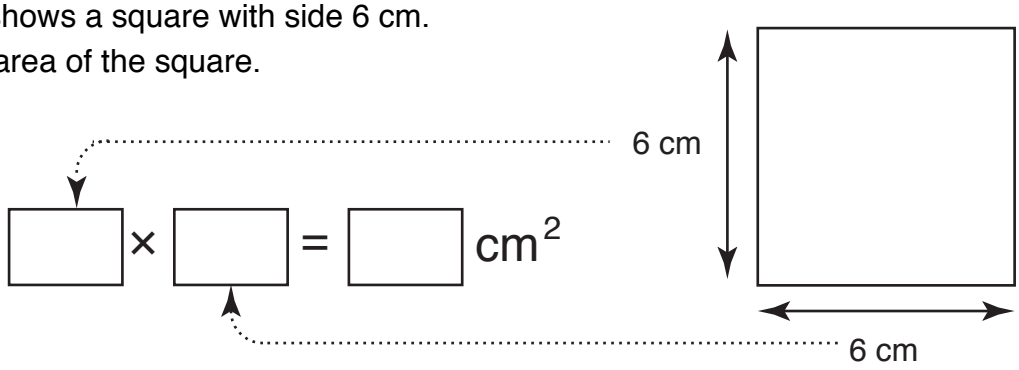
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6.10 Area with cut outs extension 1

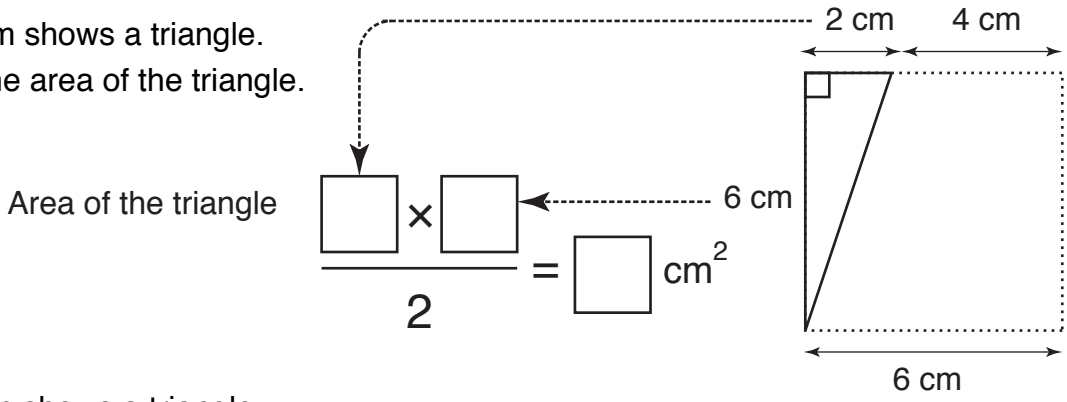
F/H

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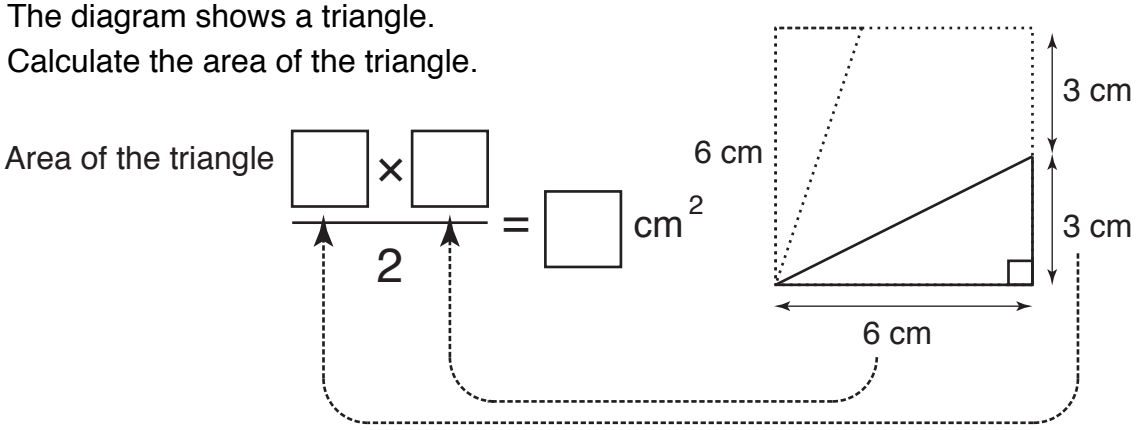
1a The diagram shows a square with side 6 cm.
Calculate the area of the square.



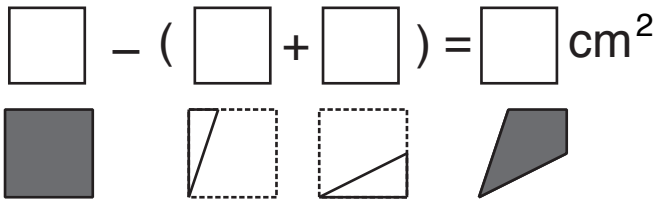
1b The diagram shows a triangle.
Calculate the area of the triangle.

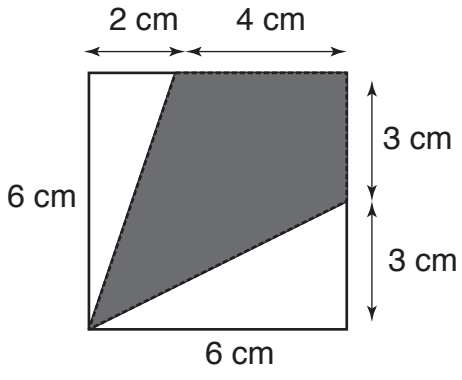


1c The diagram shows a triangle.
Calculate the area of the triangle.



1d The diagram shows a square with side 6 cm.
Calculate the fraction of the square that is shaded.





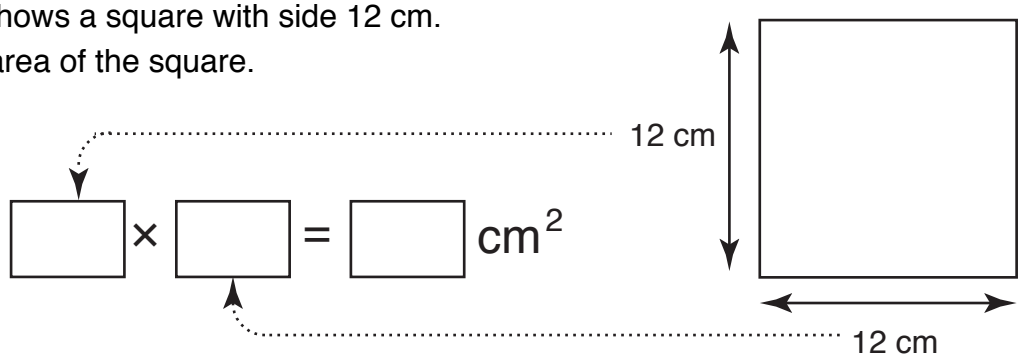
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6.10 Area with cut outs extension 2

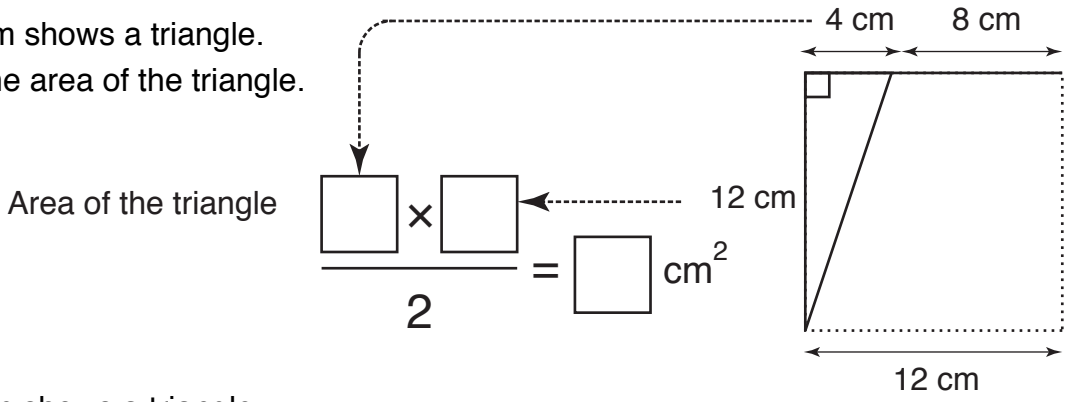
F/H

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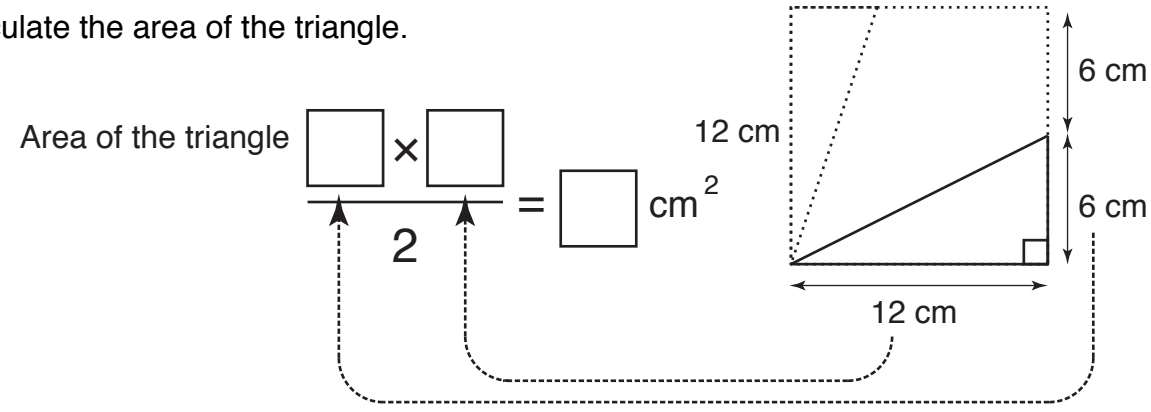
1a The diagram shows a square with side 12 cm.
Calculate the area of the square.



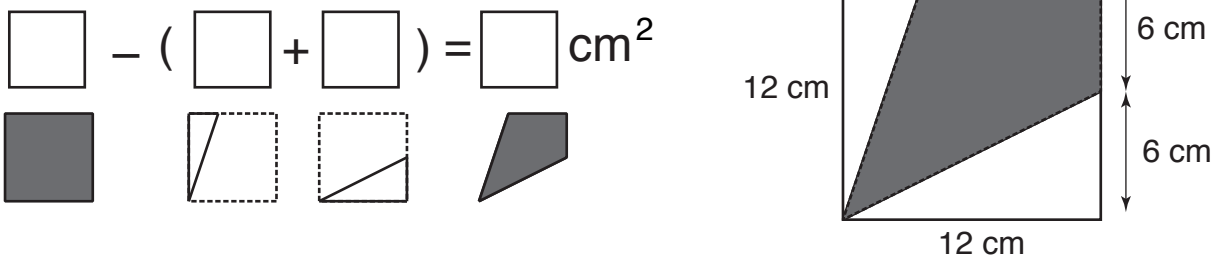
1b The diagram shows a triangle.
Calculate the area of the triangle.



1c The diagram shows a triangle.
Calculate the area of the triangle.



1d The diagram shows a square with side 12 cm.
Calculate the fraction of the square that is shaded.



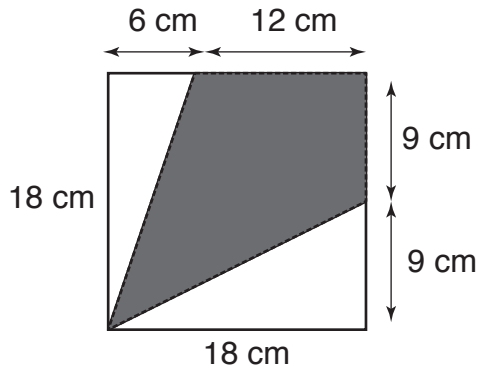
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6.10 Area with cut outs extension: Test

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1 The diagram shows a square of side 10 cm.



Work out the area of the shape that is shaded.

Answer _____

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7 Area and coverage

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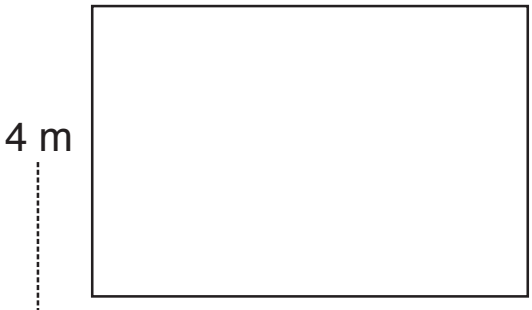
7.1 Area coverage introduction 1

F/H

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1 Dan has a shed.

Here is a plan of his shed floor.



1a Calculate the area of the floor.

□ × □ = □

1b Dan wants to paint the floor of his shed.
He buys some floor paint.

Floor Paint
1 tin covers $12m^2$

Dan wants to buy the least number of tins possible.

How many tins does he buy?

□ ÷ 12 = □

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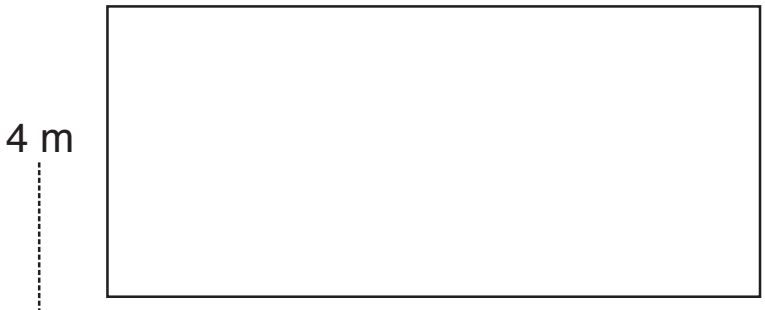
7.1 Area coverage introduction 2

F/H

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1 Sue has a shed.

Here is a plan of her shed floor.



1a Calculate the area of the floor.

□ × □ = □

1b Sue wants to paint the floor of her shed.
She buys some floor paint.

Floor Paint
1 tin covers 12m^2

Sue wants to buy the least number of tins possible.

How many tins does she buy?

□ ÷ □ = □

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7.1 Area coverage introduction: Test

F/H

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1 John has a shed.
Here is a plan of his shed floor.



John wants to paint the floor of his shed.
He buys some floor paint.

Floor Paint
1 tin covers $12m^2$

John wants to buy the least number of tins possible.

How many tins does he buy?

Answer _____ tins

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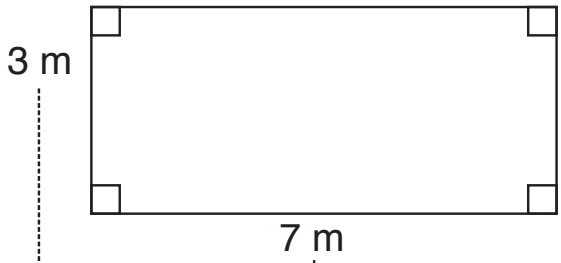
7.2 Area coverage next steps 1

F/H

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1 Jane measures a wall in her room.

Here is a plan of the wall.



1a Calculate the area of the wall.

□ × □ = □

1b Jane wants to paint the wall.
She buys some paint.

Floor Paint
1 tin covers 12m^2

Jane wants to buy enough paint to cover the wall.

How many tins does she buy?

□ ÷ □ = □

Whole tins.
(Round up to the next whole number).

1c Jane pays £5 for each tin.

Floor Paint
£5 each tin.

What is the total amount that Amy pays?

□ × □ = £□

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7.2 Area coverage next steps 2

F/H

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1 Amy measures a wall in her room.

Here is a plan of the wall.



1a Calculate the area of the wall.

□ × □ = □

1b Amy wants to paint the wall.
She buys some paint.

Floor Paint
1 tin covers 8m ^{2}

Amy wants to buy enough paint to cover the wall.

How many tins does she buy?

□ ÷ □ = □

Whole tins.
(Round up to the next whole number).

1c Amy pays £4 for each tin.

Floor Paint
£4 each tin.

What is the total amount that Amy pays?

□ × □ = £□

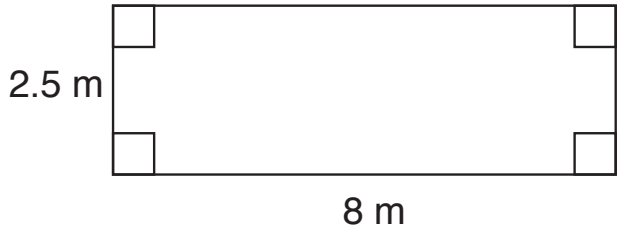
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7.2 Area coverage next steps: Test

F/H

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1 Peter measures a wall in his room.
Here is a plan of the wall.



Peter wants to paint the wall.
He buys some paint.

Paint
1 tin covers $8m^2$
£6 for each tin

Peter wants to buy enough paint to cover the wall.
How much does Peter spend on paint?

Answer _____ tins

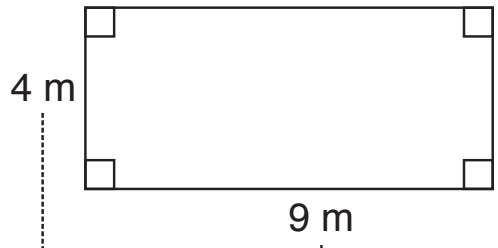
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7.3 Area coverage advanced 1

F/H

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1 Chloe has a garage.
Here is a plan of her garage floor.



1a Calculate the area of the floor.

□ × □ = □ m²

1b Amy wants to paint the garage floor.
She can use either Paint A or Paint B.

Paint A
1 tin covers 12m²

Paint B
1 tin covers 10m²

How many tins does Amy need?

Whole tins

□ ÷ □ = □

Whole tins (Round up)

□ ÷ □ = □

1c Here are the prices for the paint.

Paint A
£4 each tin

Paint B
£3.20 each tin

Work out the cost for each paint.

□ × □ = £ □

□ × □ = £ □

1d Chloe wants to paint the floor as cheaply as possible. Which paint should she choose?

Answer _____

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7.3 Area coverage advanced 2

F/H

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1 John has a garage.
Here is a plan of his garage floor.



1a Calculate the area of the floor.

□ × □ = □ m^2

1b John wants to paint the garage floor.
He can use either Paint A or Paint B.

Paint A
1 tin covers 15m^2

Paint B
1 tin covers 10m^2

How many tins does John need?

Whole tins (Round up)

□ ÷ □ = □

Whole tins

□ ÷ □ = □

1c Here are the prices for the paint.

Paint A
£4 each tin

Paint B
£2.90 each tin

Work out the cost for each paint.

□ × □ = £□

□ × □ = £□

1d John wants to paint the floor as cheaply as possible. Which paint should he choose?

Answer _____

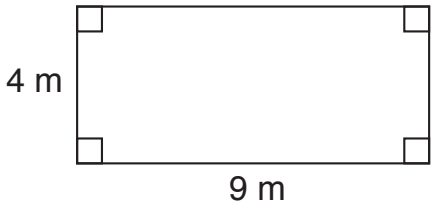
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7.3 Area coverage advanced: Test

F/H

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1 Peter has a garage.
Here is a plan of his garage floor.



Peter wants to buy enough paint to cover the garage floor as cheaply as possible.
There are two types of paint to choose from, Paint A or Paint B.

Paint A	***Paint B***
1 tin covers $12m^2$	1 tin covers $10m^2$
£3.60 each tin	£3 each tin

Which type of paint should Peter buy?
You must show all your working.

Answer _____

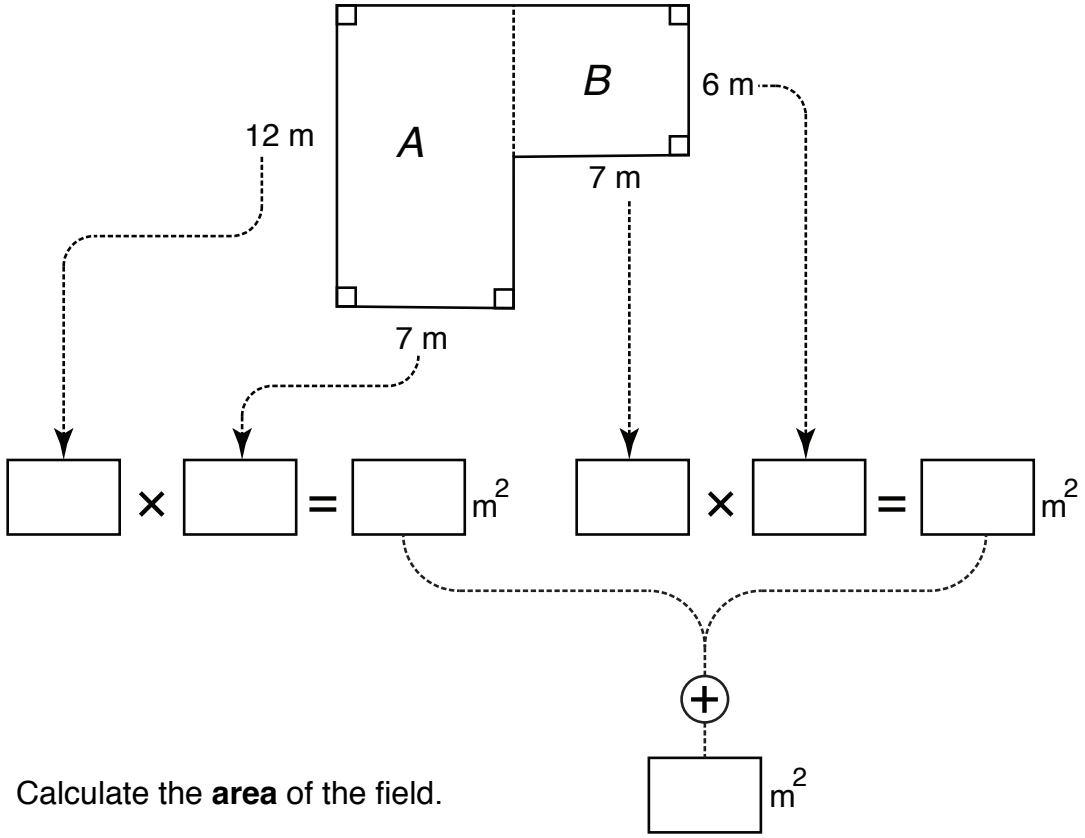
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7.4 Area coverage extension 1

F/H

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1 The diagram shows the plan of a small field.



1a Calculate the **area** of the field.

1b Tim is going to keep some cows in the field.

Each cow needs an area of **40** m^2

Complete the table.

Cows	Area needed (m^2)
1	1 × 40 = 40
2	2 × 40 = 80
3	3 × 40 = 120
4	

1c What is the **maximum** number of cows that Tim can keep in the field?

Answer _____

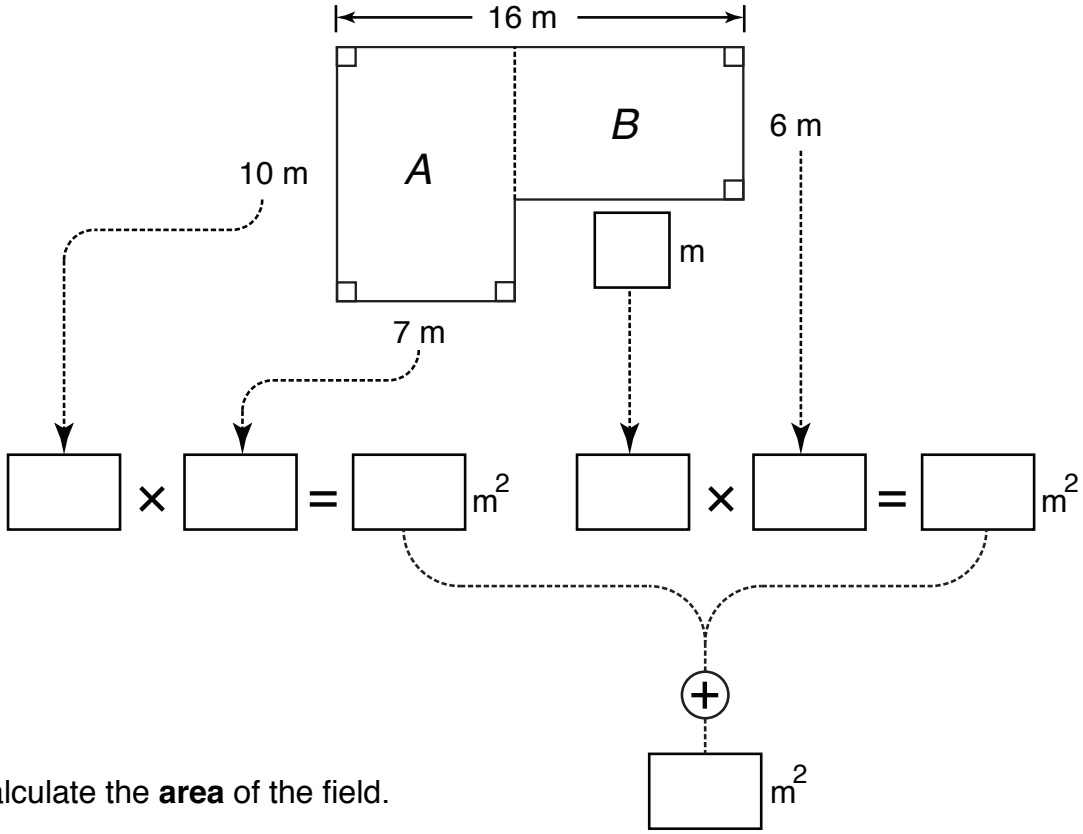
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7.4 Area coverage extension 2

F/H

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1 The diagram shows the plan of a small field.



1a Calculate the **area** of the field.

1b Kevin is going to keep some pigs in the field.

Each pig needs an area of **36** m^2

Complete the table.

Pigs	Area needed (m^2)
1	1 × 36 = 36
2	2 × 36 = 72
3	
4	

1c What is the **maximum** number of pigs that Kevin can keep in the field?

Answer _____

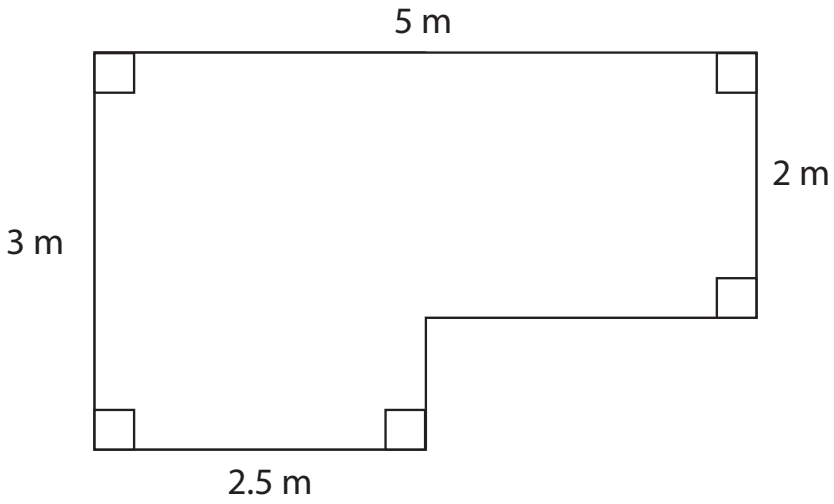
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7.4 Area coverage extension: Test

F/H

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1 The diagram shows the plan of a small field.



Peter is going to keep some chickens in the field.
Each chicken needs an area of **3 m²**

Work out the **maximum** number of chickens Peter can keep in the field.

Answer _____

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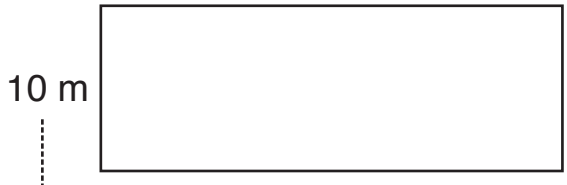
7.5 Area coverage trapeziums 1

F/H

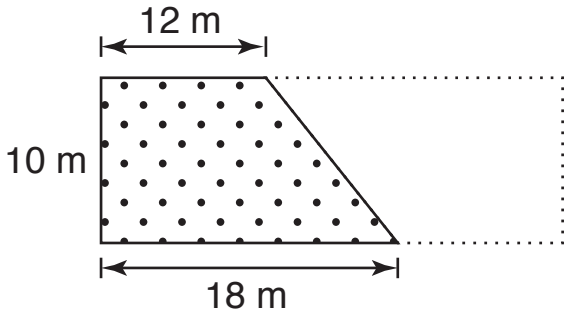
Licensed to The King's School, Devon

1 Here is a diagram of Jim's garden.

1a Calculate the area of the rectangle.



× = m^2



1b Calculate the area of the trapezium.

÷ 2 = m^2

1c Jim wants to cover the trapezium with grass seed.



Grass seed is sold in boxes.

There is enough grass seed in **each box** to cover **20 m²** of the garden.

Work out the **minimum** number of boxes needed.

Answer _____ boxes.

1d **Each** box of grass seed costs **£5**.
Work out the **least cost** of putting grass seed on Jim's garden.

Answer £ _____

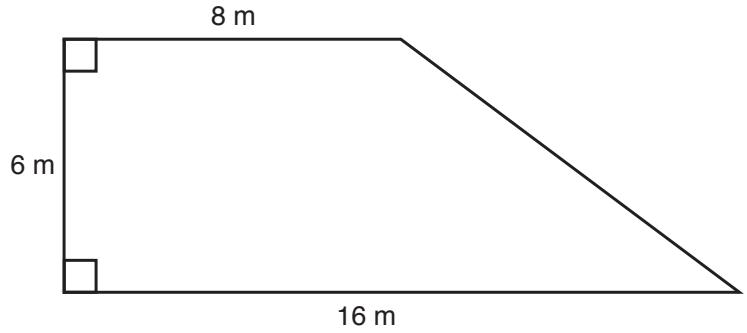
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7.5 Area coverage trapeziums 2

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1 Here is a diagram of Stephen's garden.



1 a Work out the area of the garden.

Answer _____

1 b Stephen wants to cover his garden with grass seed to make a lawn.
Grass seed is sold in bags.
There is enough grass seed in each bag to cover **20 m²** of garden.
Work out the **minimum** number of bags needed.

Answer _____ bags

1 c **Each** bag of grass seed costs **£4.86**
Work out the **least cost** of putting grass seed on Stephen's garden.

Answer £ _____

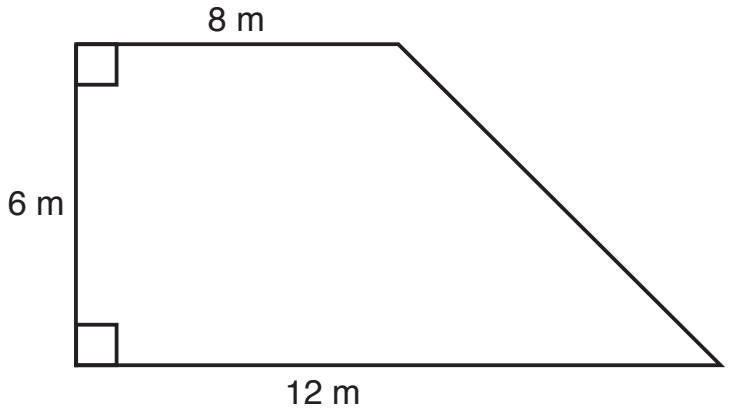
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7.5 Area coverage trapeziums: Test

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1 Here is a diagram of Luke's garden.



Luke wants to cover his garden with grass seed to make a lawn.

Grass seed is sold in bags.
There is enough grass seed in each bag to cover 25 m^2 of garden.

Each bag of grass seed costs £5.99

Work out the least cost of putting grass seed on Luke's garden.

Answer £ _____

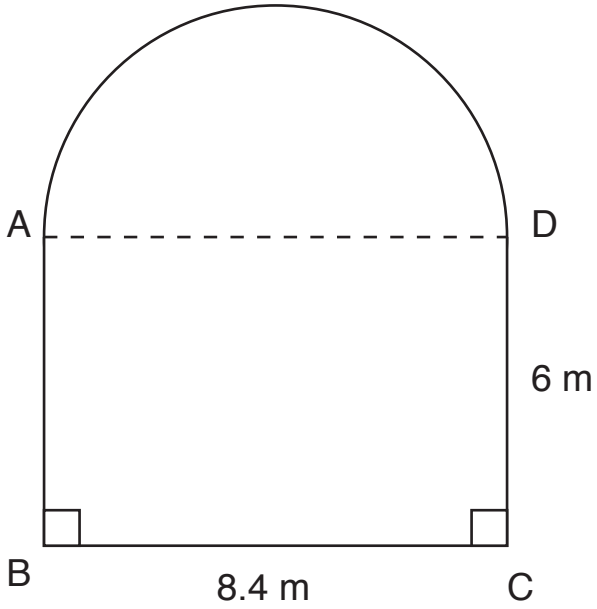
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7.6 Area coverage and semicircles 1

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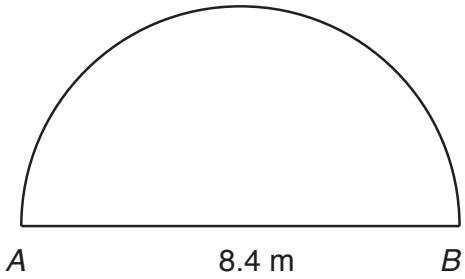
1 A garden is in the shape of a rectangle, *ABCD*, and a semicircle.
AD is the diameter of the semicircle.



Carol is going to cover the garden with fertiliser.

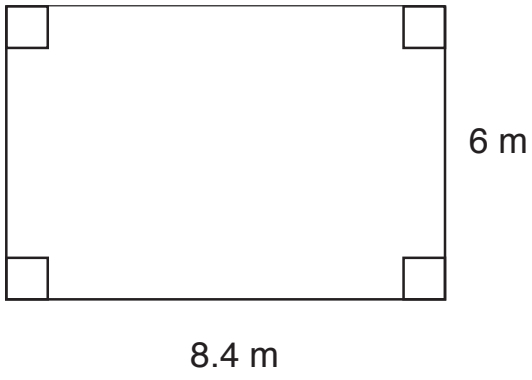
A box of fertilizer costs **£5**
Carol has been told that one box of fertiliser will cover **12 m²** of garden.

1 a Work out the area of semicircle



Answer _____ m²

1 b Work out the area of a rectangle



Answer _____ m²

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1 c Use your answer from **1a** and **1b** to work out the area of the garden

Answer _____ m^2

1 d Susan has been told that one box of fertiliser will cover **12 m^2** of garden.
How many boxes of fertiliser will Susan need to cover the garden completely.

Answer _____

1 e A box of fertilizer costs **£5.**
Work out the cost of buying enough fertilizer to cover the garden completely

Answer £ _____

1 f Susan finds out that one box of fertiliser will cover more then 12 m^2 of garden.
Explain how this might affect the number of boxes she needs to buy.

Answer _____

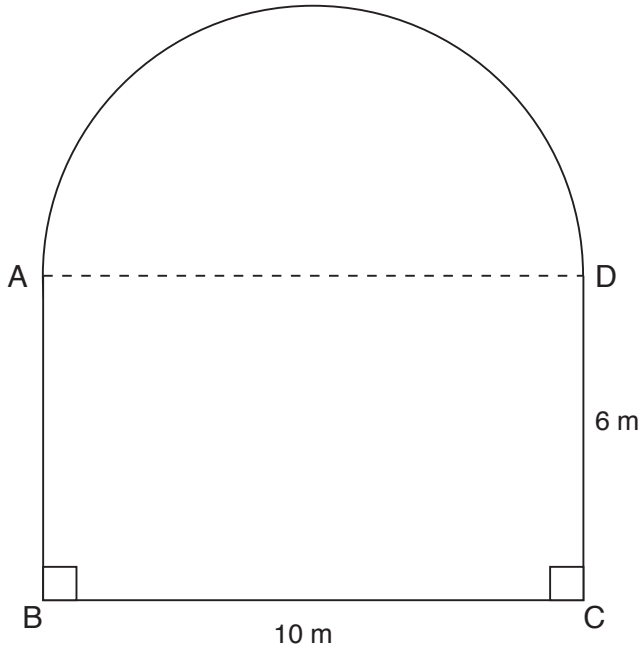
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7.6 Area coverage and semicircles 2

F/H

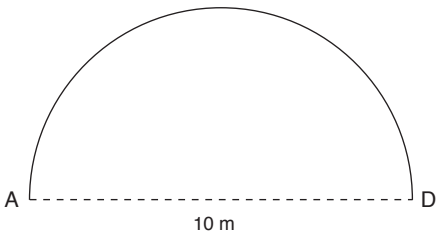
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1 A garden is in the shape of a rectangle, ABCD, and a semicircle.
AD is the diameter of the semicircle.



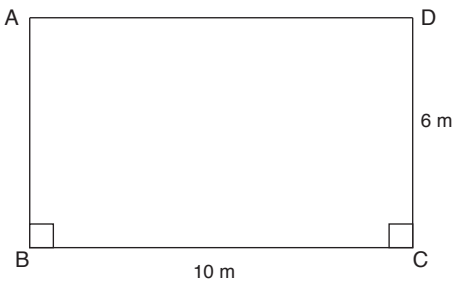
Megan is going to cover the garden with fertiliser.
A box of fertilizer costs **£6.55**
Megan has been told that one box of fertiliser will cover **12 m²** of garden.

1 a Work out the area of semicircle



Answer _____ m²

1 b Work out the area of a rectangle



Answer _____ m²

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1 c Use your answer from **1a** and **1b** to work out the area of the garden

Answer _____ m^2

1 d Megan has been told that one box of fertiliser will cover **12 m^2** of garden.
How many boxes of fertiliser will Megan need to cover the garden completely.

Answer _____

1 e A box of fertilizer costs **£6.55**
Work out the cost of buying enough fertilizer to cover the garden completely

Answer £ _____

1 f Megan finds out that one box of fertiliser will cover more then 12 m^2 of garden.
Explain how this might affect the number of boxes she needs to buy.

Answer _____

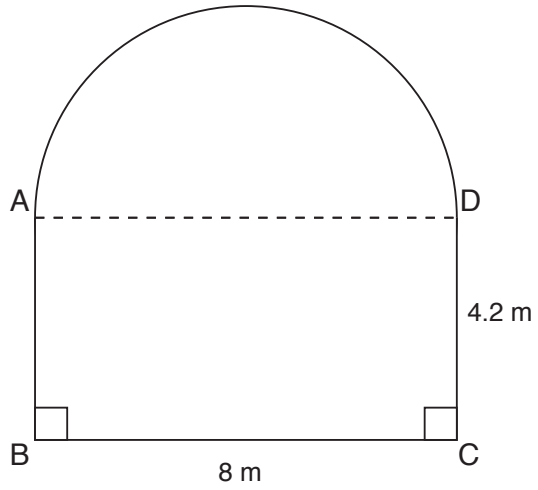
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7.6 Area coverage and semicircles: Test

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1 A garden is in the shape of a rectangle, *ABCD*, and a semicircle.
AD is the diameter of the semicircle.



Chris is going to cover the garden with fertiliser.

A box of fertilizer costs **£5.99**
Chris has been told that one box of fertiliser will cover **10 m²** of garden.

(a) Work out the cost of buying enough fertilizer to cover the garden completely.

(b) Chris finds out that one box of fertiliser will cover **more then 10 m²** of garden.
Explain how this might affect the number of boxes he needs to buy.

Answer _____

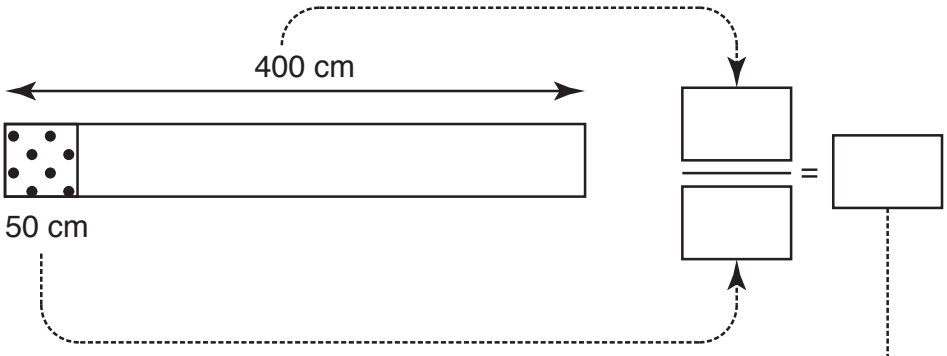
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7.7 Area coverage tiling introduction 1

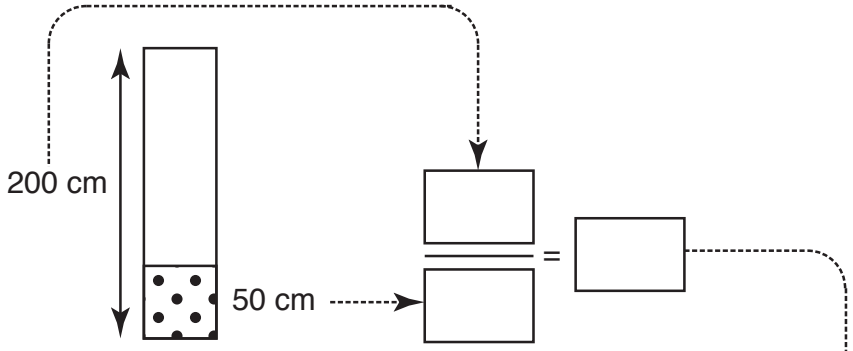
F/H

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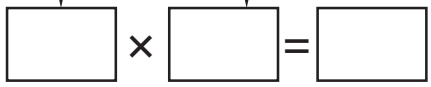
1 a John buys some square floor tiles with side 50 cm.
How many tiles are needed to fit along a length of 400cm?

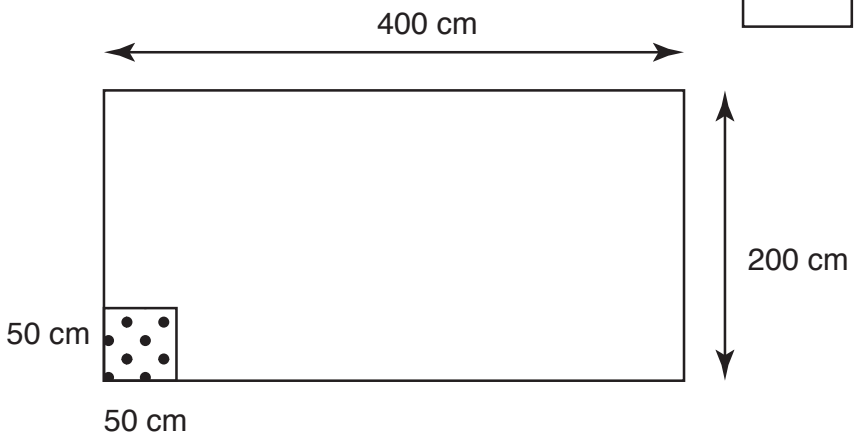


1 b How many tiles are needed to fit along a width of 200 cm?



1 c Here is a rectangle 400 cm long and 200 cm wide.
How many tiles does John need to cover the rectangle?





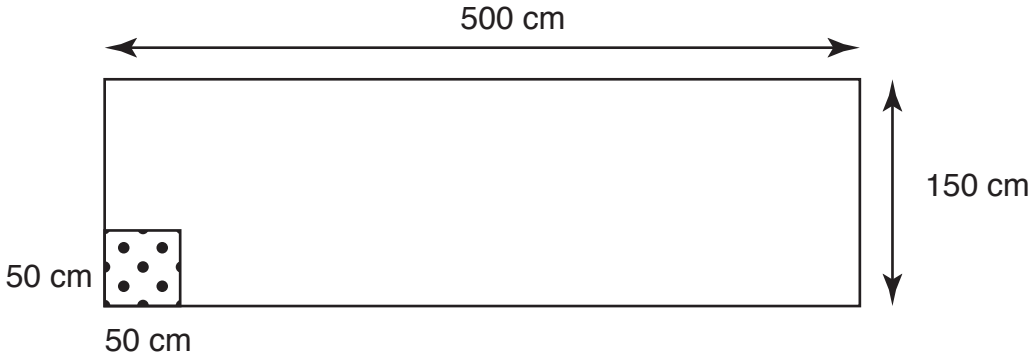
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7.7 Area coverage tiling introduction 2

F/H

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1 The diagram shows a floor in the shape of a **rectangle**.



1a How many tiles are needed to fit along a length of 500 cm?

Answer _____ tiles

1b How many tiles are needed to fit along a width of 150 cm?

Answer _____ tiles

1 c How many tiles are needed to cover the floor?

Answer _____ tiles

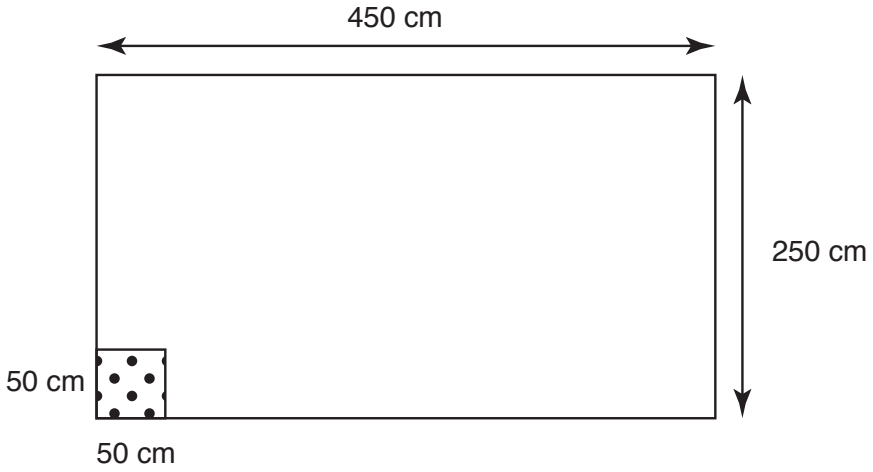
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7.7 Area coverage tiling introduction: Test

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1 The diagram shows a floor in the shape of a rectangle.



The floor is 450 cm long and 250 cm wide.

Peter is going to cover the floor with floor tiles.
Each tile is a square of side 50 cm.

Peter buys 50 of the tiles.

Does Peter buy enough tiles to cover the floor?
You must show your working.

Answer _____

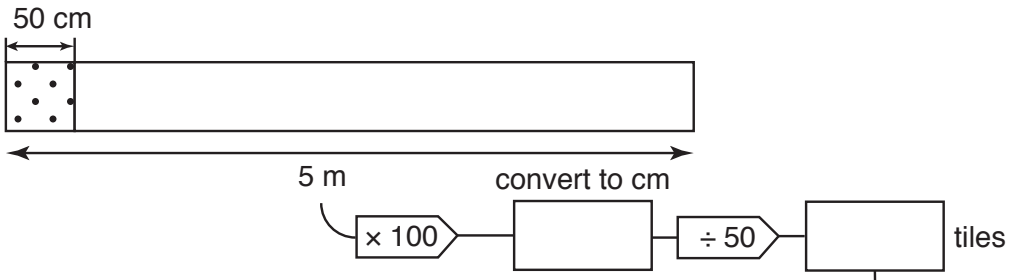
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7.8 Area coverage tiling advanced 1

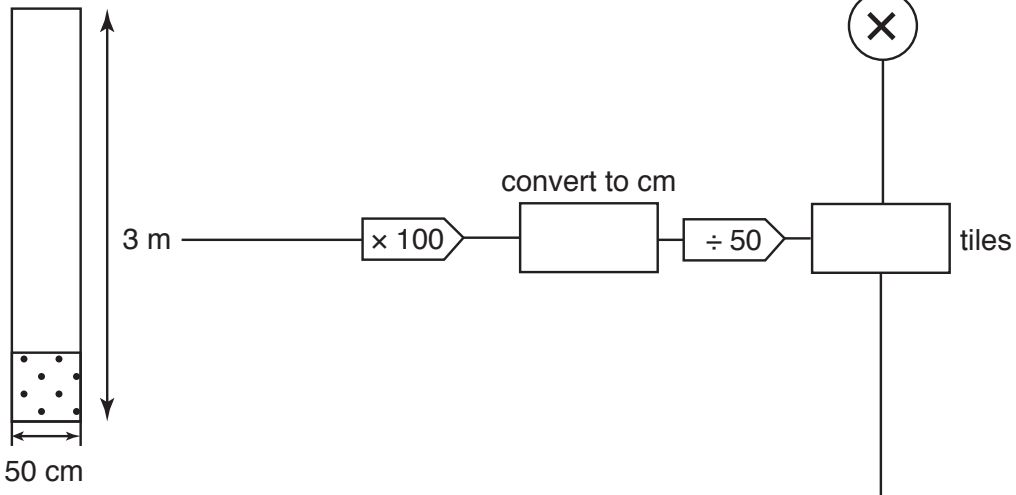
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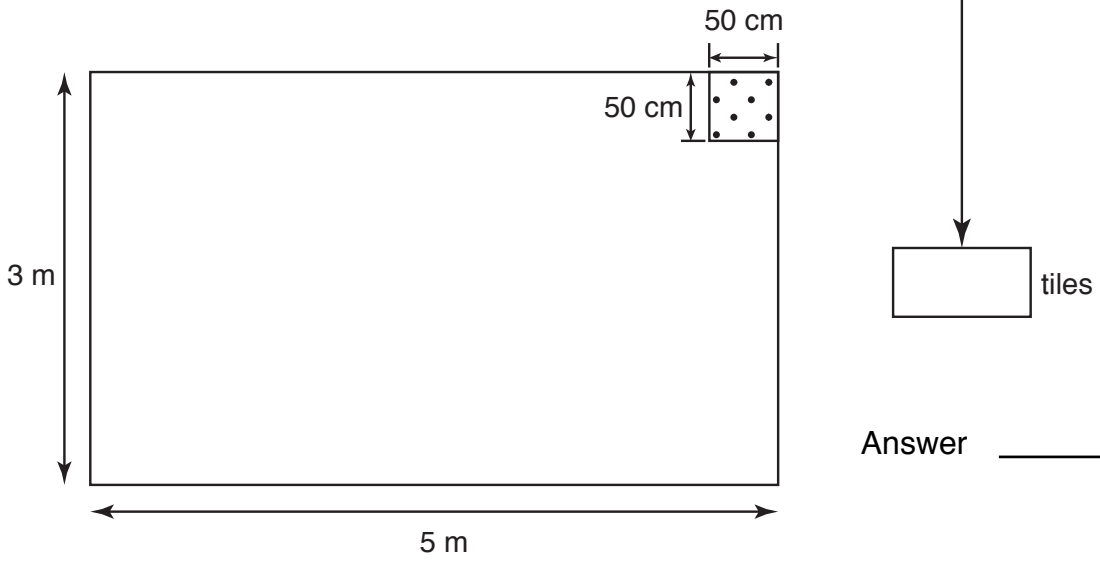
1 a John buys some **square** paving tiles with side 50 cm.
How many tiles are needed to make one row that is **5 m** long?



1 b **How many** tiles are needed to make one row that is **3 m** wide?



1c Here is a rectangle 5 m long and 3 m wide.
How many tiles does John need to cover the rectangle?



Answer _____

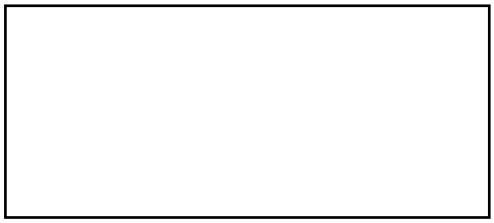
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7.8 Area coverage tiling advanced 2

F/H

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1 The diagram shows a floor in the shape of a **rectangle**.



1 a **Convert** 6.4 metres to centimetres.

Answer _____ cm

1 b Each tile is a **square** of side **40 cm**.
How many tiles are needed to make one row that is **6.4 m** long?

Answer _____ tiles

1 c **Convert 2.8** metres to centimetres.

Answer _____ cm

1 d Each tile is a **square** of side **40 cm**.
How many tiles are needed to make one row that is **2.8 m** wide?

Answer _____ tiles

1 e How many tiles are needed to cover the floor?

Answer _____

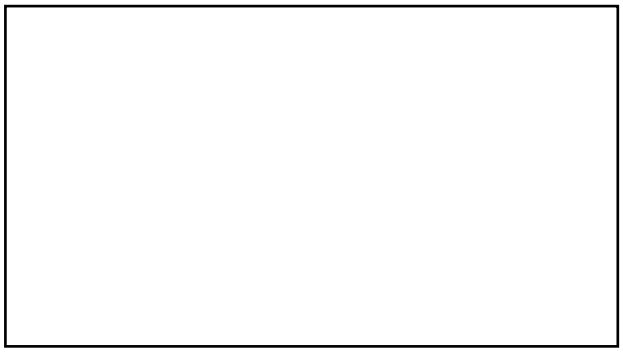
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7.8 Area coverage tiling advanced: Test

F/H

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1 The diagram shows a floor in the shape of a **rectangle**.



The floor is **8.1 m long** and **4.5 m wide**.

Peter is going to cover the floor with floor tiles.
Each tile is a **square** of side **90 cm**.

Peter buys **60** of the tiles.

Does Peter buy enough tiles to cover the floor?

Answer _____

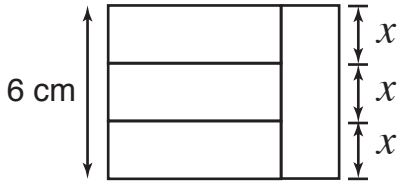
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7.9 Area coverage & algebra introduction 1

F/H

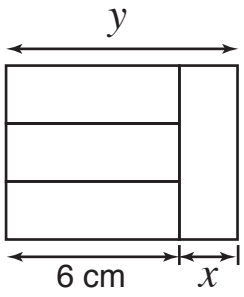
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1 a Calculate x



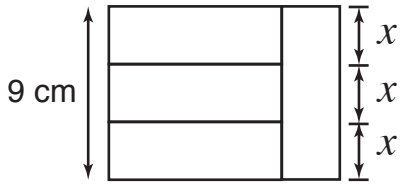
Answer _____ cm

1 b Calculate y



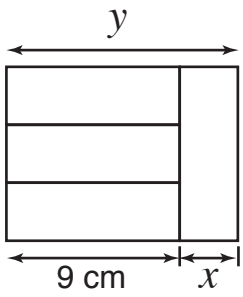
Answer _____ cm

2 a Calculate x



Answer _____ cm

2 b Calculate y



Answer _____ cm

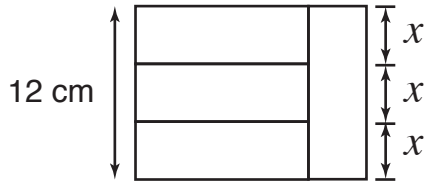
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7.9 Area coverage & algebra introduction 2

F/H

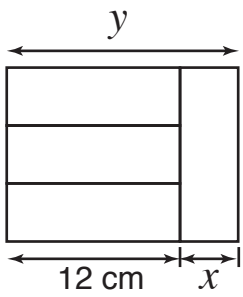
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1 a Calculate x



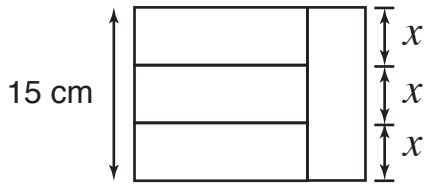
Answer _____ cm

1 b Calculate y



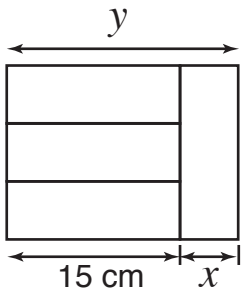
Answer _____ cm

2 a Calculate x



Answer _____ cm

2 b Calculate y



Answer _____ cm

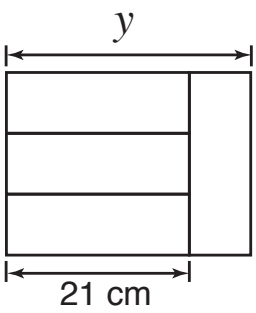
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7.9 Area coverage & algebra introduction: Test

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1 Here are some shapes made using four identical rectangles.



Work out the length of y.

Answer _____

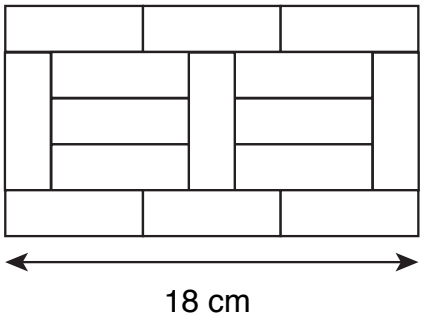
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7.10 Area coverage & algebra advanced 1

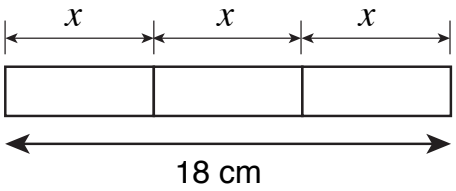
F/H

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1 A shape is made using 15 identical rectangles.

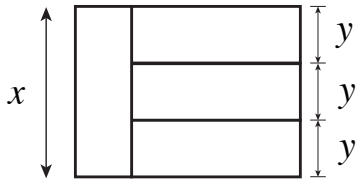


1 a Calculate length x



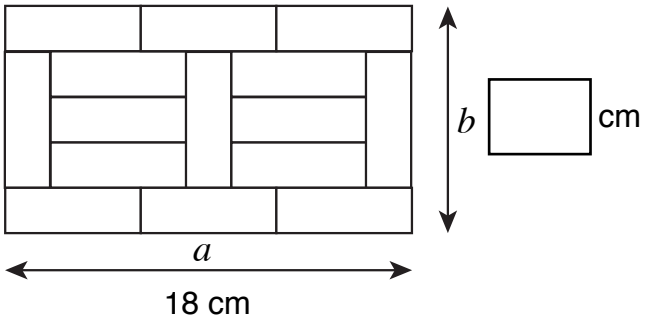
Answer _____ cm

1 b Calculate y



Answer _____ cm

1 c Work out the length of side b.



Answer _____ cm

1 d Work out the area of the shape.

Answer _____ cm^2

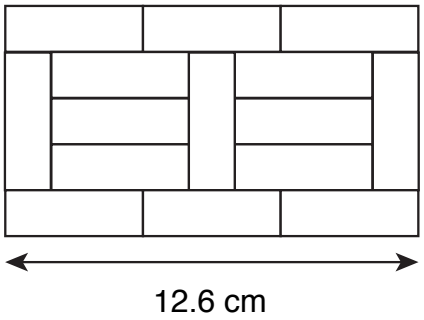
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7.10 Area coverage & algebra advanced 2

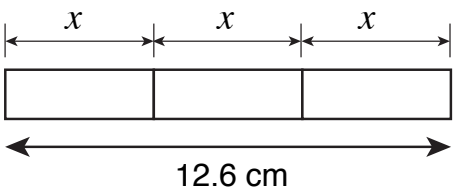
F/H

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1 A shape is made using 15 identical rectangles.

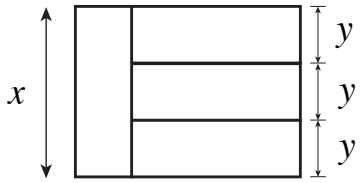


1 a Calculate length x



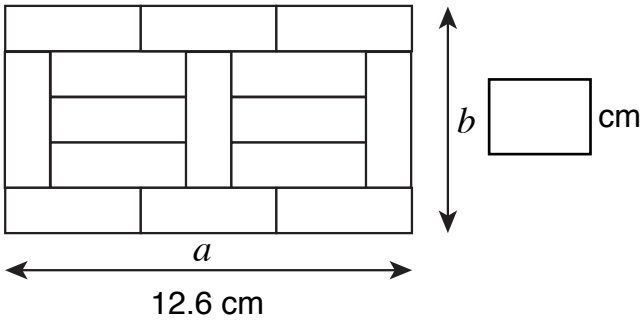
Answer _____ cm

1 b Calculate y



Answer _____ cm

1 c Work out the length of side b.



Answer _____ cm

1 d Work out the area of the shape.

Answer _____ cm^2

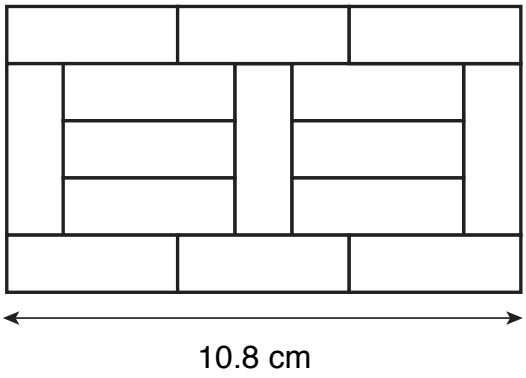
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7.10 Area coverage & algebra advanced: Test

F/H

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1 A shape is made using 15 identical rectangles.



Work out the area of the shape.

Answer _____

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8 Volume and filling

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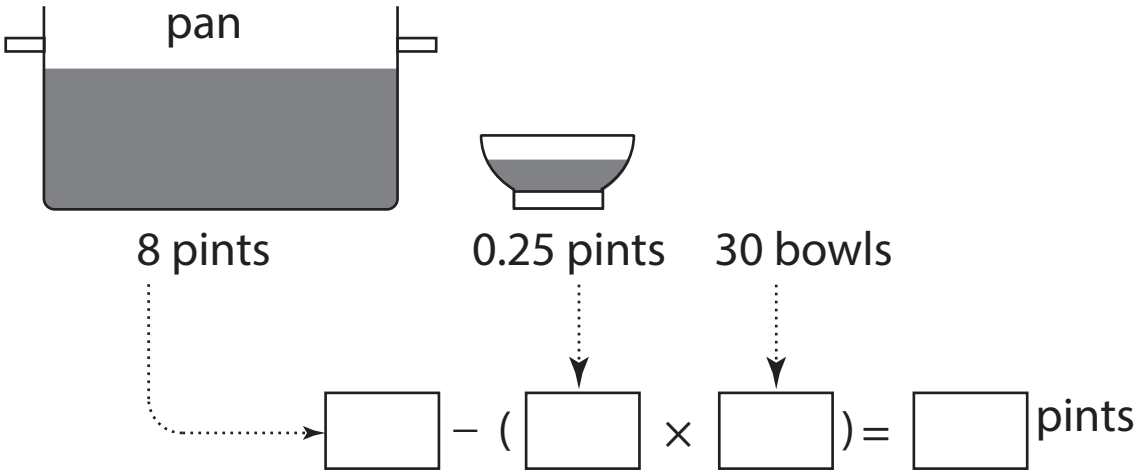
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8.1 Volume and filling 1

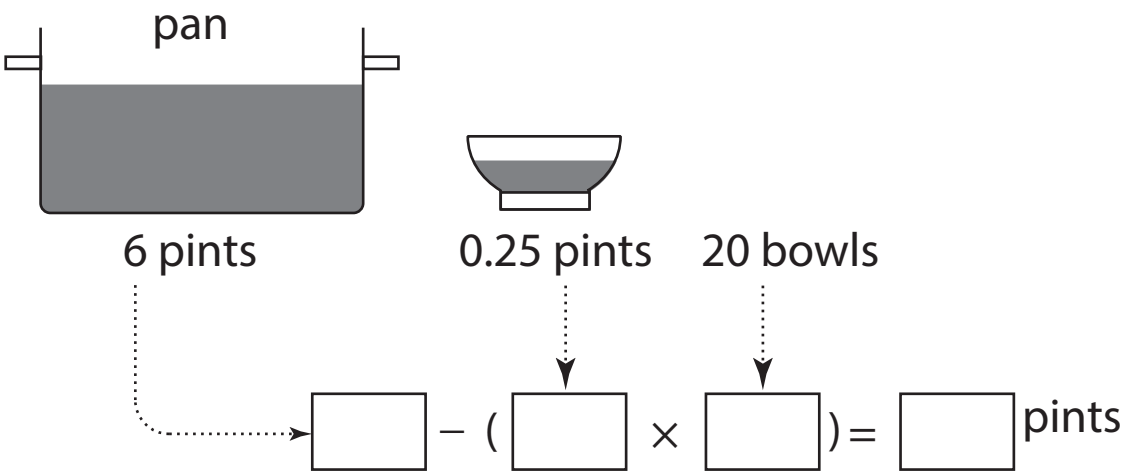
F/H

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1 Andrew has 8 pints of soup in a pan.
He also has 30 bowls.
He puts 0.25 pints of soup in each bowl.
How much soup does he have left?



2 Emily has 6 pints of soup in a pan.
She also has 20 bowls.
She puts 0.25 pints of soup in each bowl.
How much soup does she have left?



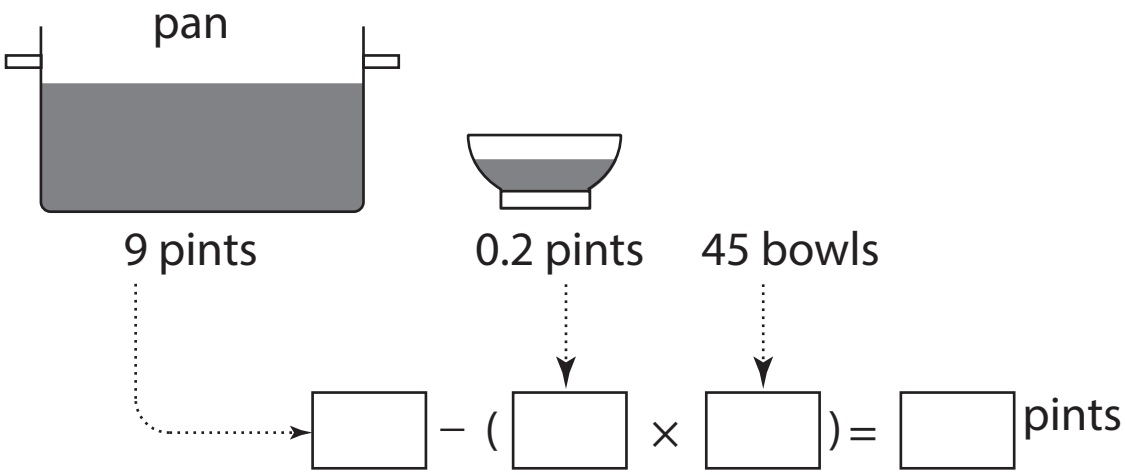
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8.1 Volume and filling 2

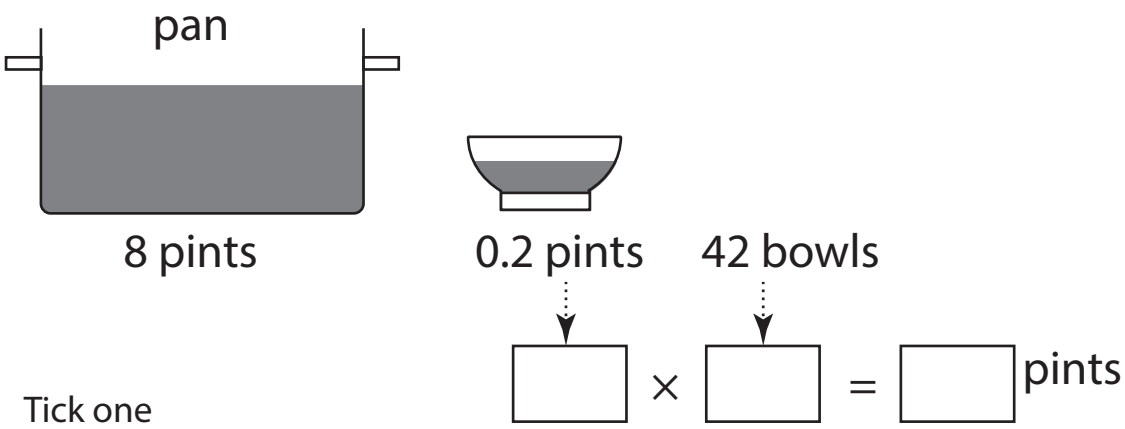
F/H

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1 Kal has 9 pints of soup in a pan.
He also has 45 bowls.
He puts 0.2 pints of soup in each bowl.
How much soup does he have left?



2 Adrian has 8 pints of soup in a pan.
He also has 42 bowls.
He wants to put 0.2 pints of soup in each bowl.
Does he have enough?
You must show your working.



Tick one

☐ He has enough soup

☐ He does not have enough soup

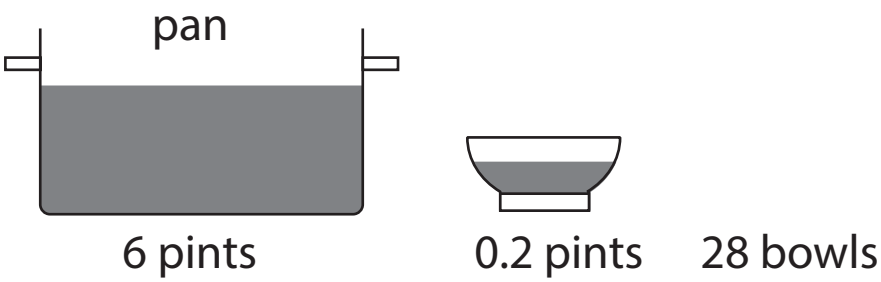
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8.1 Volume and filling: Test

F/H

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1 Kurtis has 6 pints of soup in a pan.
He also has 28 bowls.
He puts 0.2 pints of soup in each bowl.
How much soup does he have left?



Answer _____

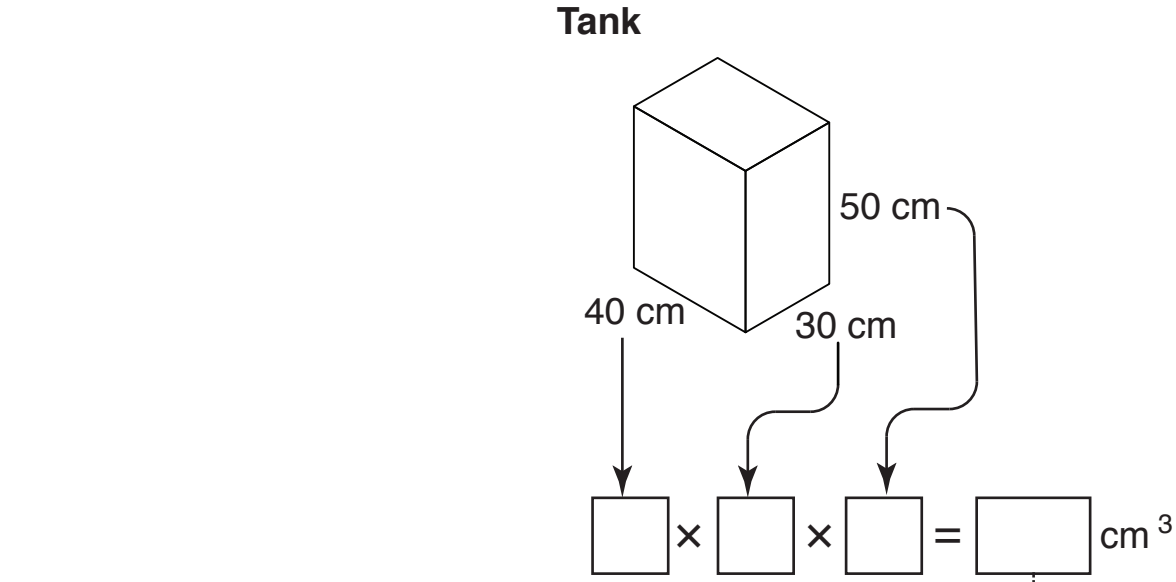
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8.2 Volume and transferring introduction 1

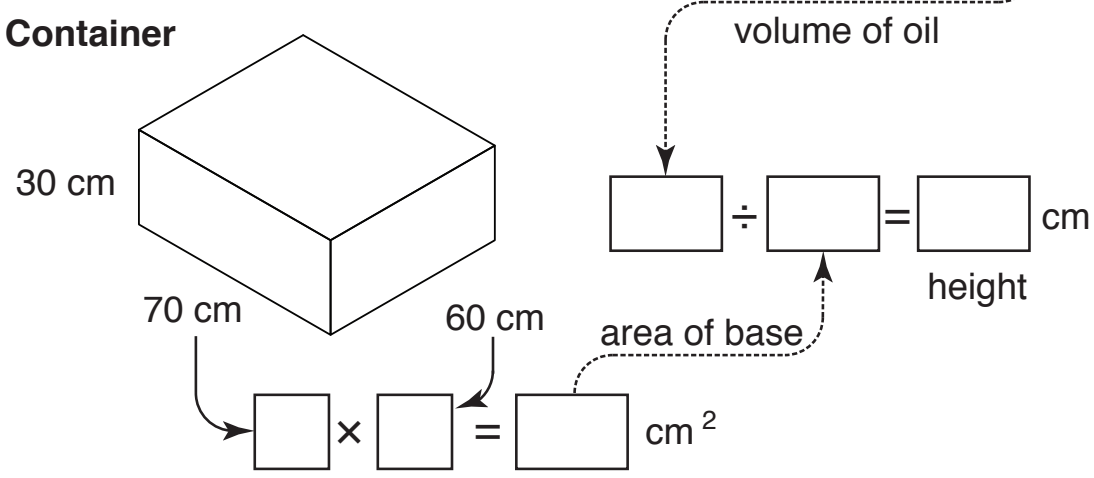
F/H

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1a The diagram shows a **tank** in the shape of a **cuboid**.
The tank is full of oil.
Calculate the **volume** of the tank.



1b The diagram shows an **empty** container in the shape of a **cuboid**.
The oil from the tank is put into the container.
Work out the **height** of the oil in the container.



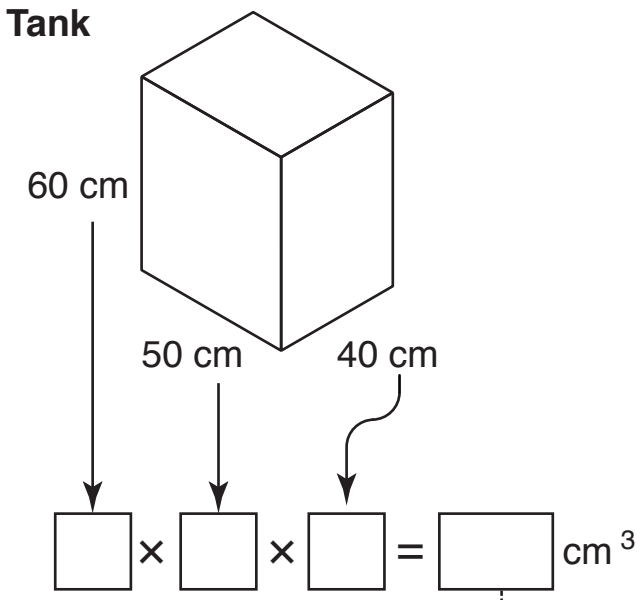
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8.2 Volume and transferring introduction 2

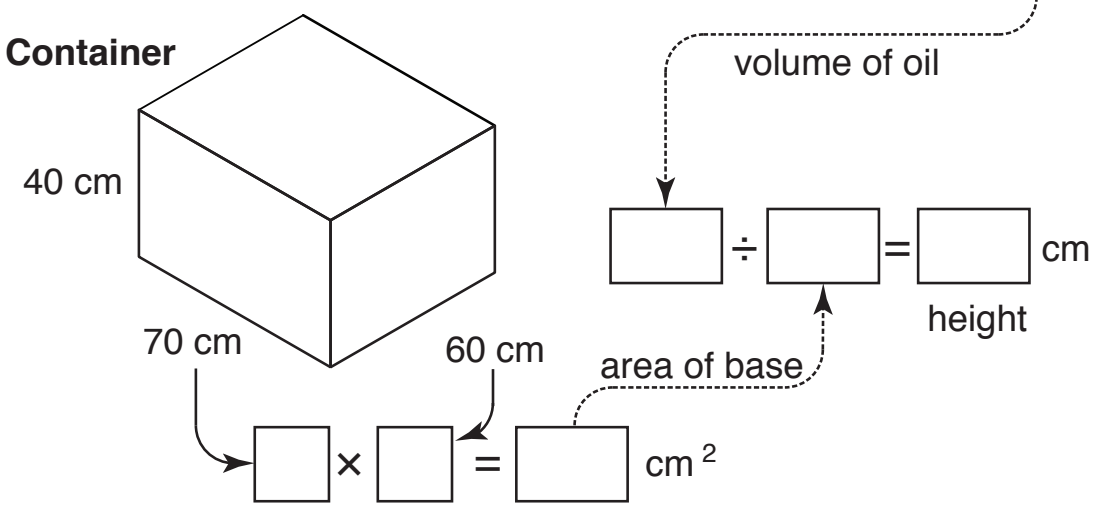
F/H

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1a The diagram shows a **tank** in the shape of a **cuboid**.
The tank is full of oil.
Calculate the **volume** of the tank.



1b The diagram shows a container in the shape of a **cuboid**.
The container is empty.
The oil from the tank is put into the container.
Work out the **height** of the oil in the container.



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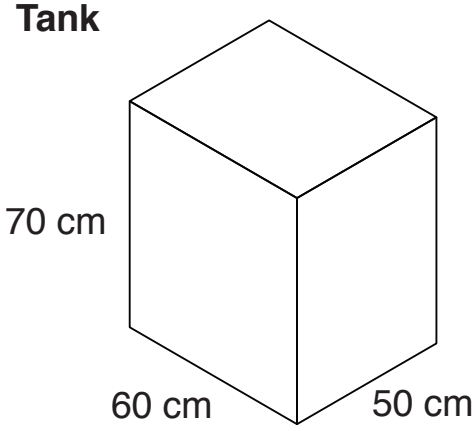
8.2 Volume and transferring introduction: test

F/H

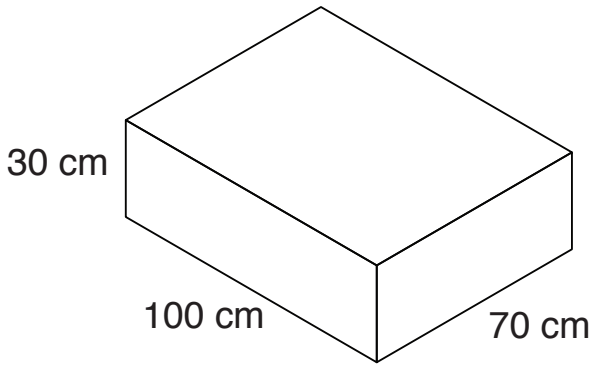
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1 The diagram shows a tank in the shape of a cuboid.
It also shows a container in the shape of a cuboid.

Tank



Container



The tank is full of oil.
The container is empty.

The oil from the tank is put into the container.

Work out the height of the oil in the container.
Give your answer to one decimal place.

Answer _____

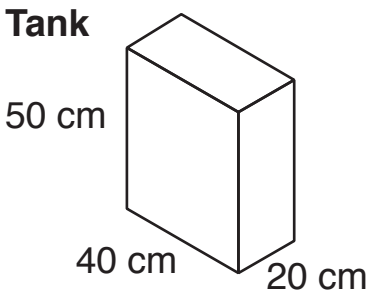
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8.3 Volume and transferring next steps 1

F/H

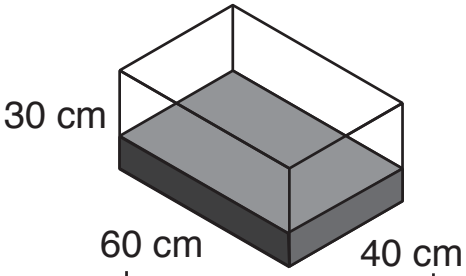
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1a The diagram shows a **tank** in the shape of a **cuboid**.
The tank is full of oil.
Calculate the **volume** of the tank.



□ × □ × □ = □ cm ^{3}

1b The diagram shows a **container** in the shape of a **cuboid**.
There is **24 000 cm^3** of oil in the container.
Work out the height of the oil in the container.



□ × □ = □ cm ^{2}
area of base

24 000 cm ^{3} ÷ □ = height □ cm

1c The oil from the tank is put into the container.
What is the height of oil now in the container?

□ ÷ □ = □ cm

Answer □ cm

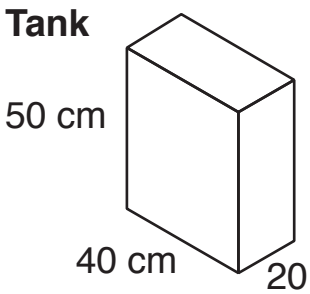
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8.3 Volume and transferring next steps 2

F/H

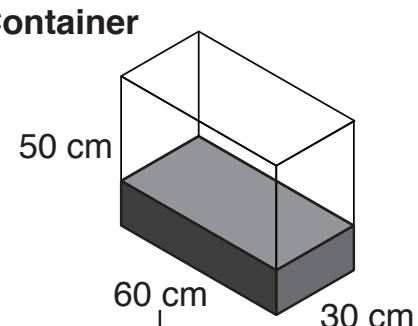
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1a The diagram shows a **tank** in the shape of a **cuboid**.
The tank is full of oil.
Calculate the **volume** of the tank.



□ × □ × □ = □ cm 3

1b The diagram shows a **container** in the shape of a **cuboid**.
There is **36 000 cm³** of oil in the container.
Work out the height of the oil in the container.



□ × □ = □ cm 2
area of base

36 000 cm 3 ÷ □ = □ cm
height

+

1c The oil from the tank is put into the container.
What is the height of oil now in the container?

□ ÷ □ = □ cm

Answer □ cm

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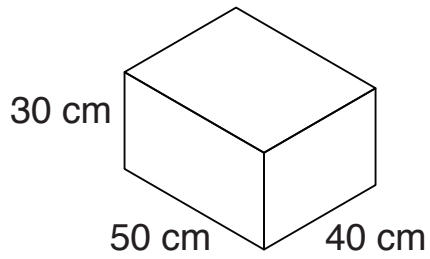
8.3 Volume and transferring next steps: test

F/H

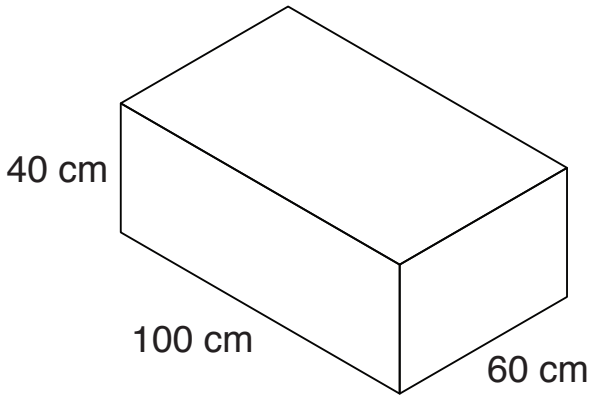
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1 The diagram shows a tank in the shape of a cuboid.
It also shows a container in the shape of a cuboid.

Tank



Container



The tank is full of oil.
The container has 60 000 cm^3 of oil.

The oil from the tank is put into the container.

Work out the height of the oil in the container.
Give your answer to one decimal place.

Answer _____

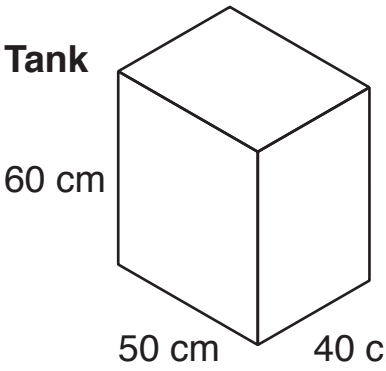
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8.4 Volume and transferring advanced 1

F/H

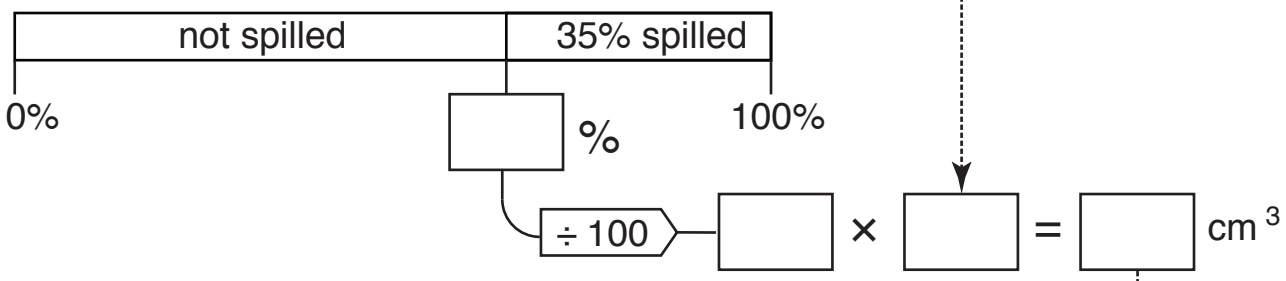
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1a The diagram shows a **tank** in the shape of a **cuboid**.
Calculate the **volume** of the tank.

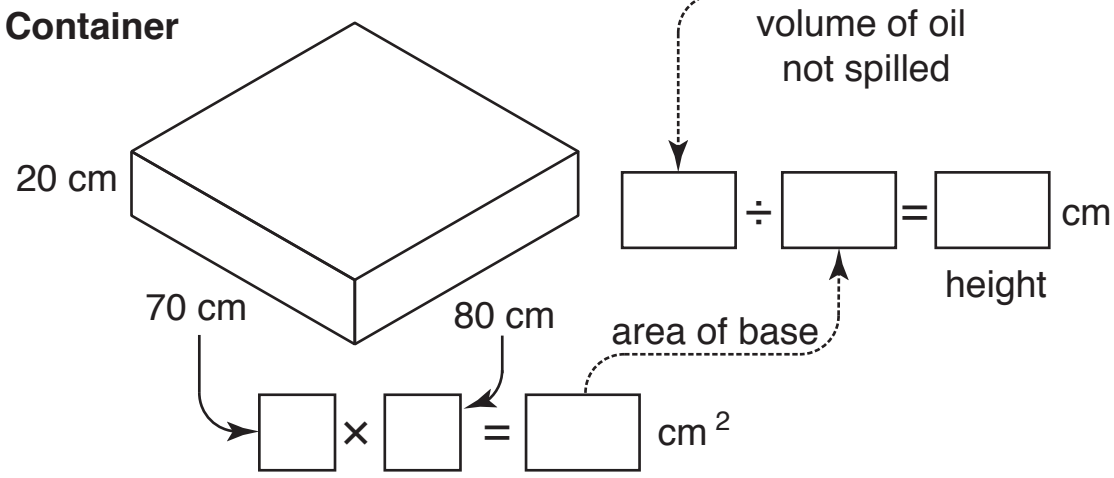


□ × □ × □ = □ cm ^{3}

1b The tank is **full** of oil.
35% of the oil from the tank is **spilled**.
Calculate the **volume** of oil that is **not spilled**.



1c The diagram shows an **empty** container in the shape of a **cuboid**.
The oil that is **not spilled** from the **tank** is put in the **container**.
Work out the **height** of the oil in the container.



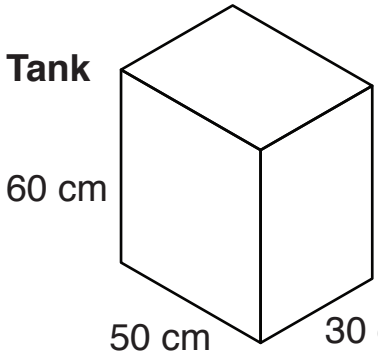
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8.4 Volume and transferring advanced 2

F/H

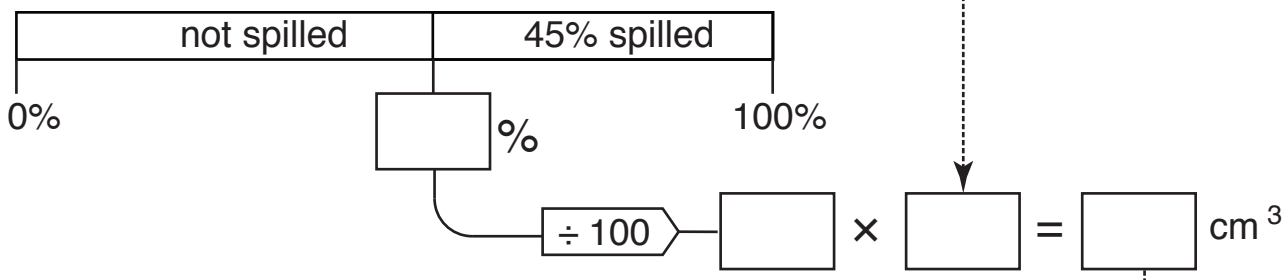
Licensed to The King's School, Devon

1a The diagram shows a **tank** in the shape of a **cuboid**.
Calculate the **volume** of the tank.

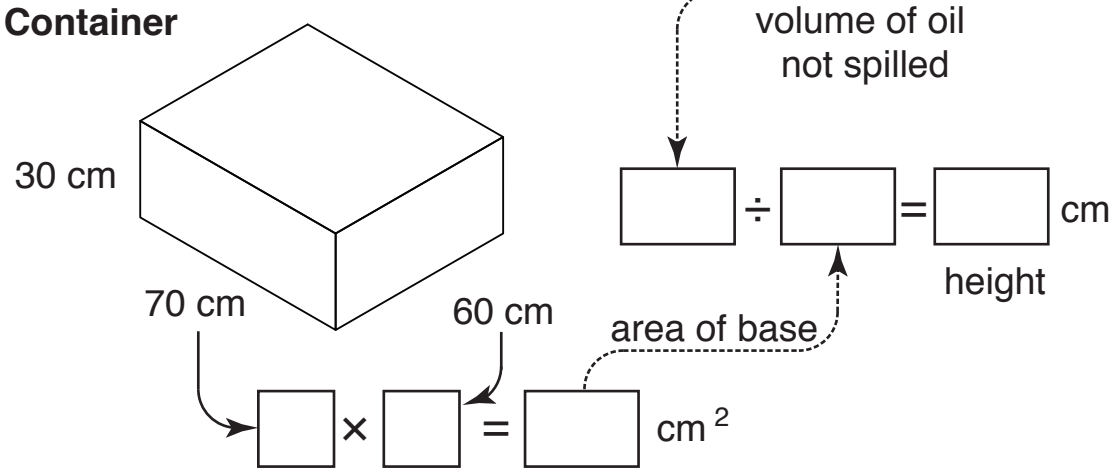


□ × □ × □ = □ cm ^{3}

1b The tank is **full** of oil.
45% of the oil from the tank is spilled.
Calculate the **volume** of oil that is not spilled.



1c The diagram shows a container in the shape of a **cuboid**.
The container is **empty**.
The oil that is **not spilled** from the **tank** is put in the **container**.
Work out the **height** of the oil in the container.



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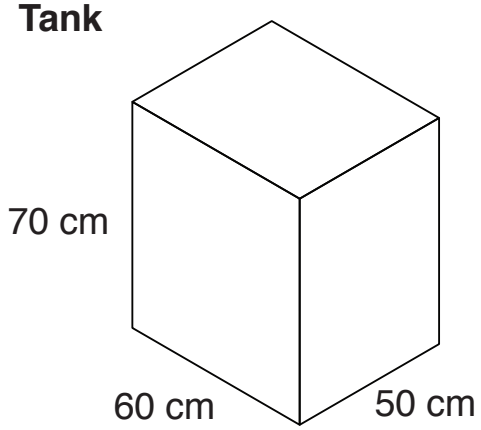
8.4 Volume and transferring advanced: Test

F/H

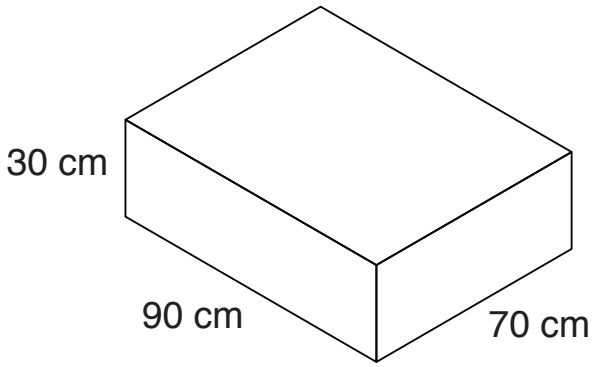
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1 The diagram shows a tank in the shape of a cuboid.
It also shows a container in the shape of a cuboid.

Tank



Container



The tank is full of oil.
The container is empty.

35% of the oil from the container is spilled.
The rest of the oil is put into the container.

Work out the height of the oil in the container.
Give your answer to one decimal place.

Answer _____

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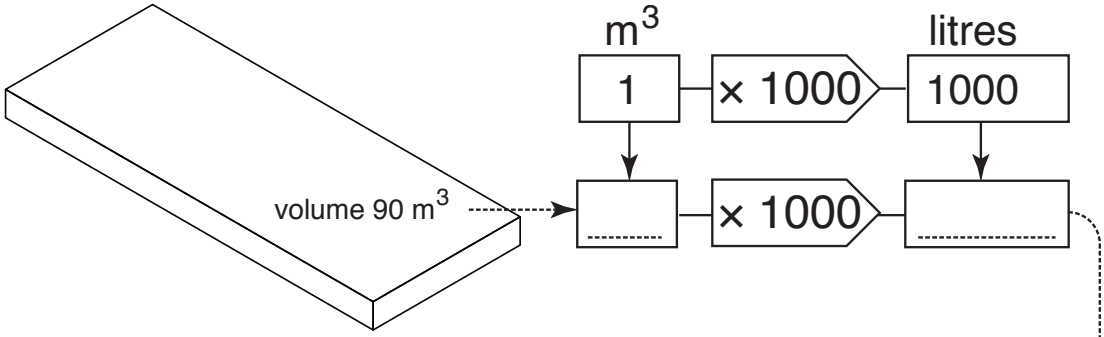
8.5 Volume and rate of filling introduction 1

F/H

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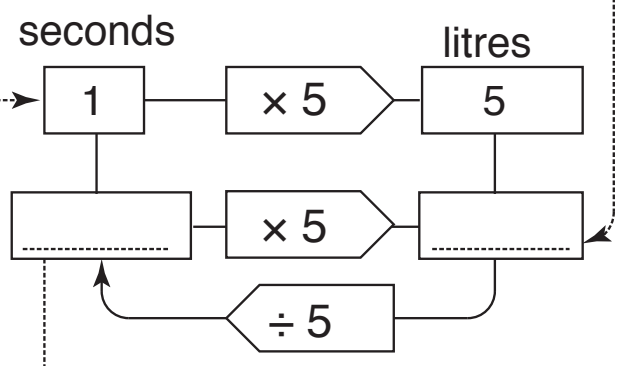
1a The diagram shows a swimming pool.
The volume of the swimming pool is 90 m^3.

1 m^3 = 1000 litres.
Convert 90 m^3 to litres.

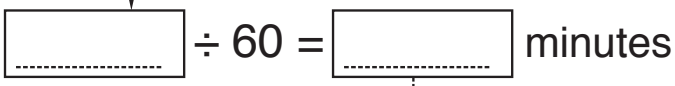


1b The swimming pool is filled with water at a rate of 5 litres per second.

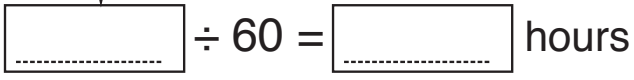
Work out how many seconds it takes to fill the pool.



1c Work out how many minutes it takes to fill the pool.



1d Work out how many hours it takes to fill the pool.



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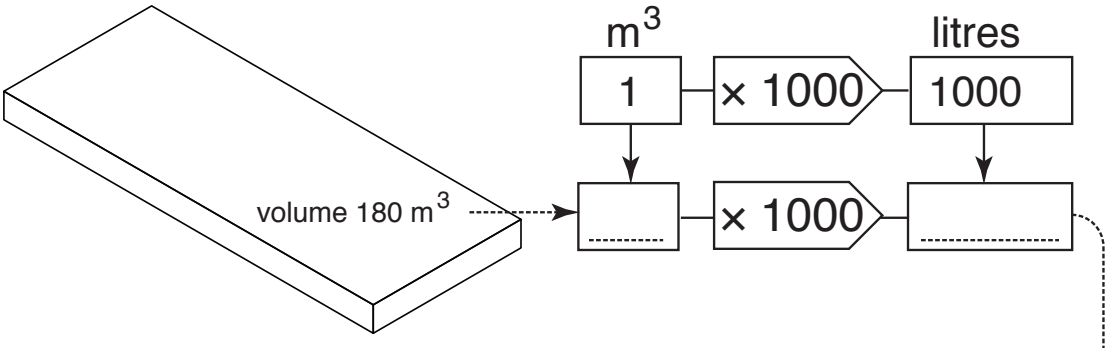
8.5 Volume and rate of filling introduction 2

F/H

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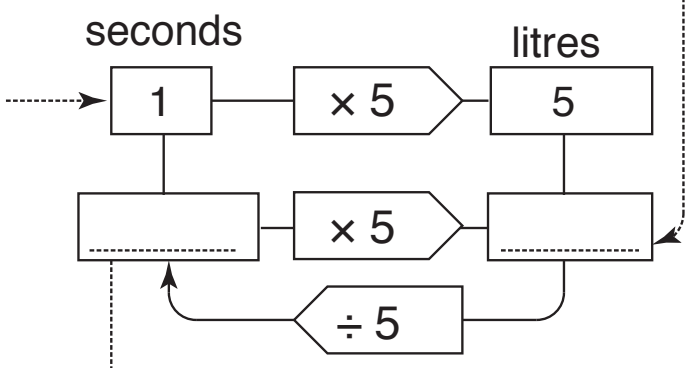
1a The diagram shows a swimming pool.
The volume of the swimming pool is 180 m^3.

1 m^3 = 1000 litres.
Convert 180 m^3 to litres.

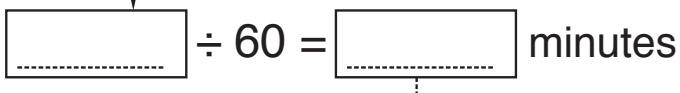


1b The swimming pool is filled with water at a rate of 5 litres per second.

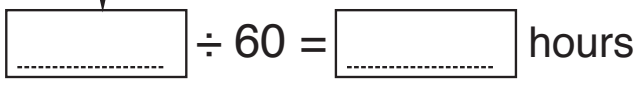
Work out how many seconds it takes to fill the pool.



1c Work out how many minutes it takes to fill the pool.



1d Work out how many hours it takes to fill the pool.



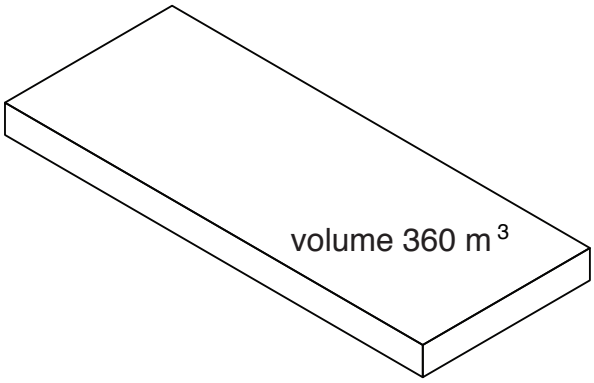
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8.5 Volume and rate of filling introduction: Test

F/H

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1



Filled at
10 litres per second

The diagram shows a swimming pool.
The volume of the swimming pool is 360 m^3.
The swimming pool is filled with water at the rate of 10 litres per second.

John has 12 hours to fill the swimming pool.

1 m^3 = 1000 litres.

Will John completely fill the swimming pool in under 12 hours?
You must show all your working.

Answer _____

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8.6 Volume and rate of filling next steps 1

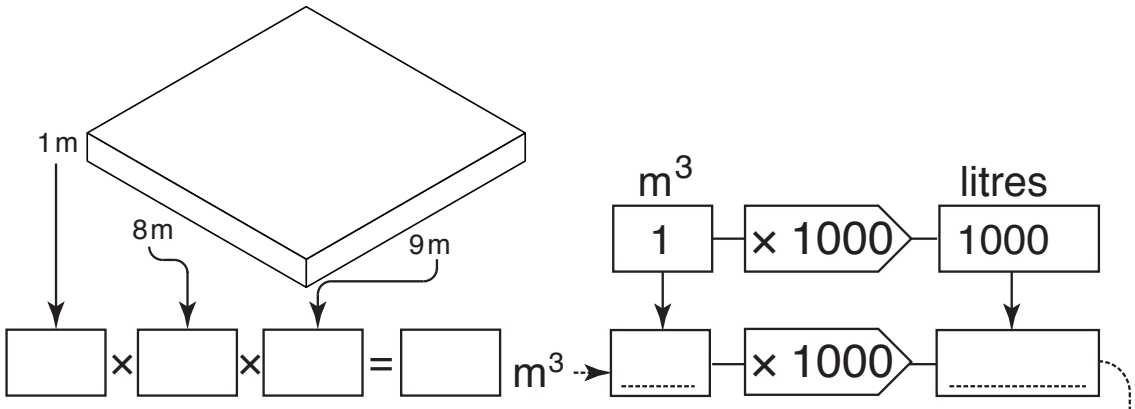
F/H

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1a The diagram shows a swimming pool.
The swimming pool is in the shape of a cuboid.

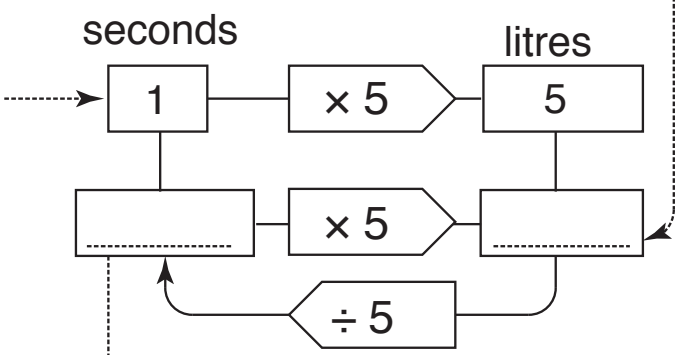
1 m^3 = 1000 litres.

Calculate the capacity of the swimming pool.

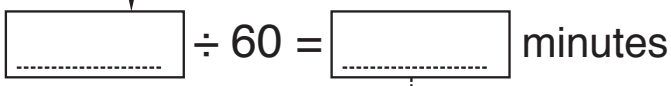


1b The swimming pool is filled with water at a rate of 5 litres per second.

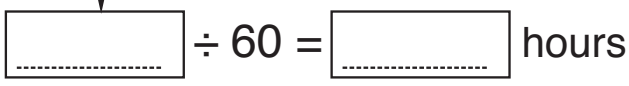
Work out how many seconds it takes to fill the pool.



1c Work out how many minutes it takes to fill the pool.



1d Work out how many hours it takes to fill the pool.



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8.6 Volume and rate of filling next steps 2

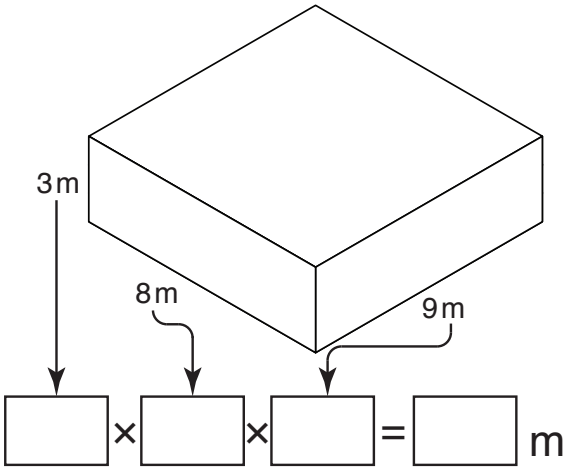
F/H

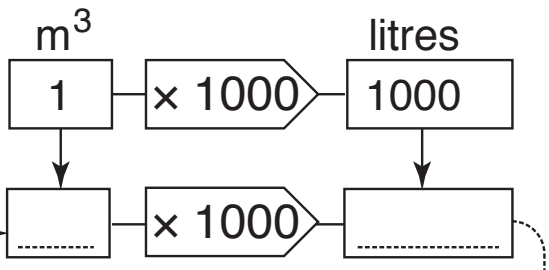
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1a The diagram shows a swimming pool.
The swimming pool is in the shape of a cuboid.

1 m^3 = 1000 litres.

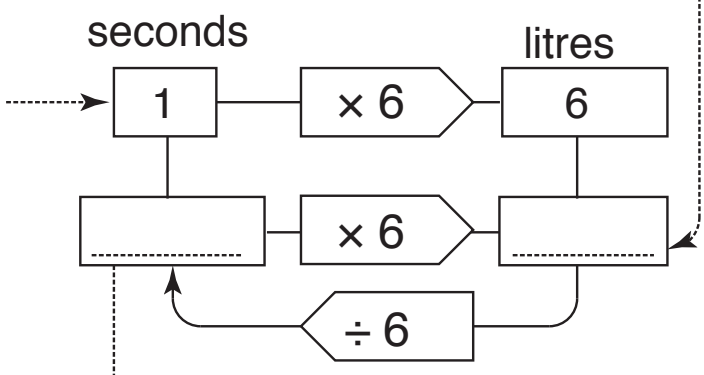
Calculate the capacity of the swimming pool.



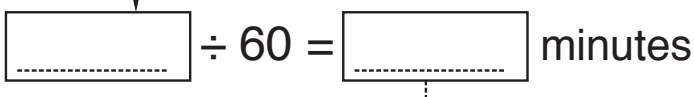


1b The swimming pool is filled with water at a rate of 6 litres per second.

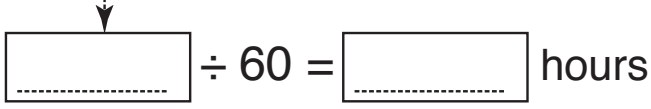
Work out how many seconds it takes to fill the pool.



1c Work out how many minutes it takes to fill the pool.



1d Work out how many hours it takes to fill the pool.



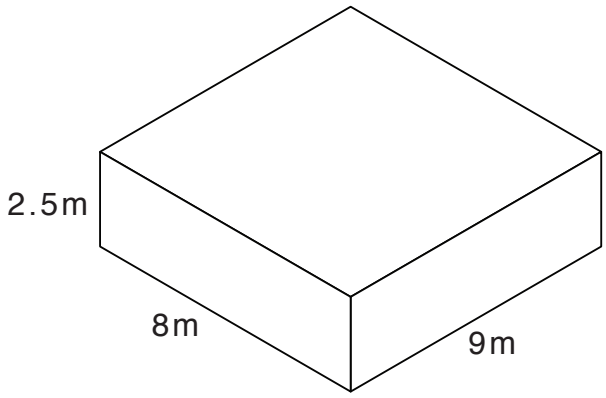
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8.6 Volume and rate of filling next steps: Test

F/H

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1



Filled at
10 litres per second

The diagram shows a swimming pool.
The swimming pool is in the shape of a cuboid.
The swimming pool is filled with water at the rate of 10 litres per second.

Jane has 6 hours to fill the swimming pool.

1 m^3 = 1000 litres.

Will Jane completely fill the swimming pool in under 6 hours?
You must show all your working.

Answer _____

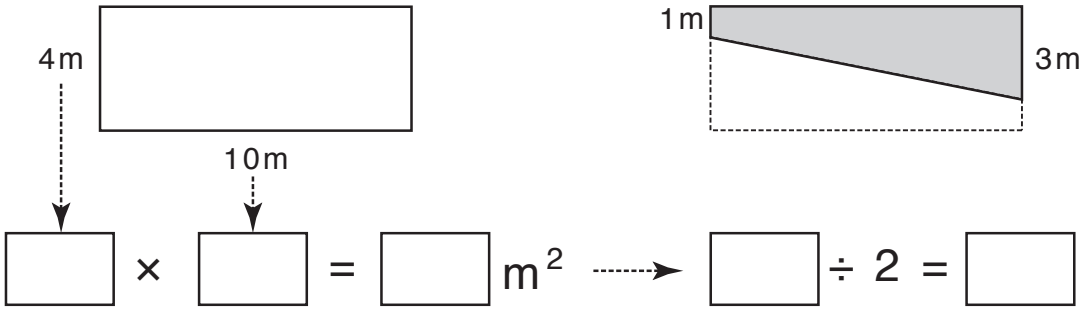
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8.7 Volume and rate of filling advanced 1

F/H

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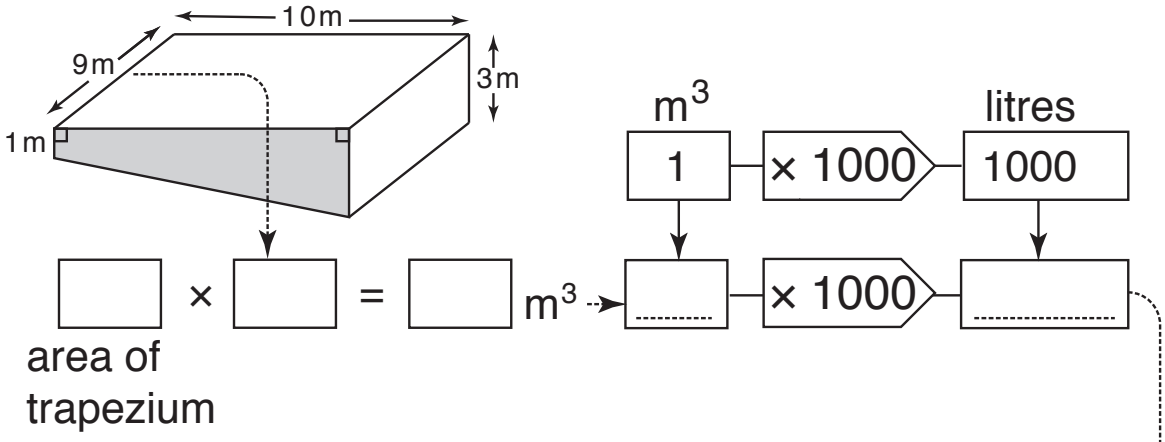
1a The diagram shows a rectangle and a trapezium.
Calculate the area of each shape.



1b The diagram shows a swimming pool.
The swimming pool is in the shape of a prism.
The cross-section is a trapezium.

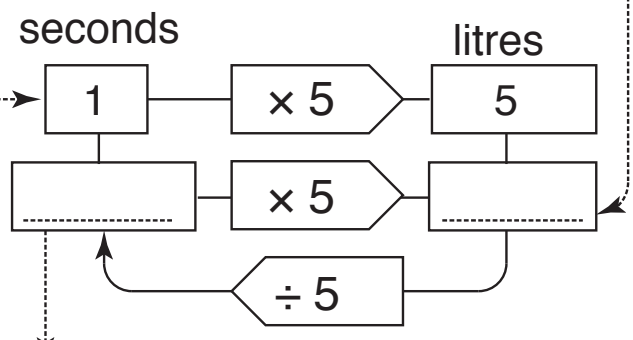
1 m^3 = 1000 litres.

Calculate the capacity of the swimming pool.

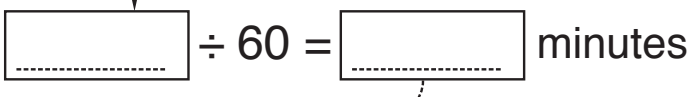


1c The swimming pool is filled with water at a rate of 5 litres per second.

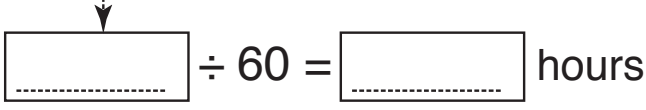
Work out how many seconds it takes to fill the pool.



1d Work out how many minutes it takes to fill the pool.



1e Work out how many hours it takes to fill the pool.



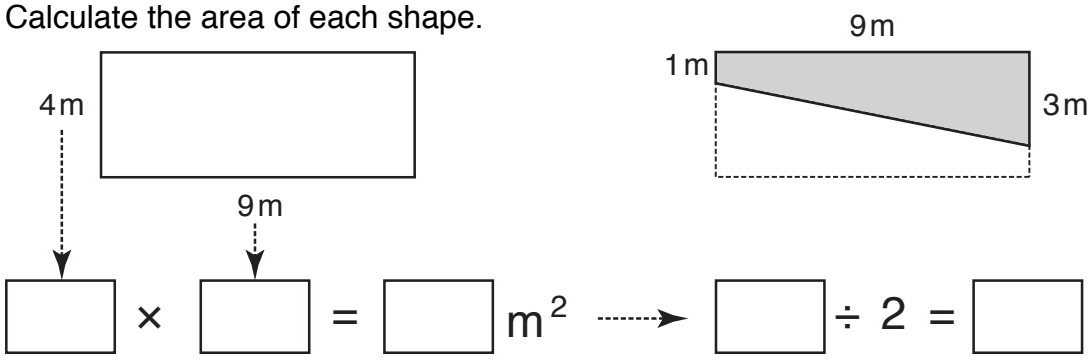
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8.7 Volume and rate of filling advanced 2

F/H

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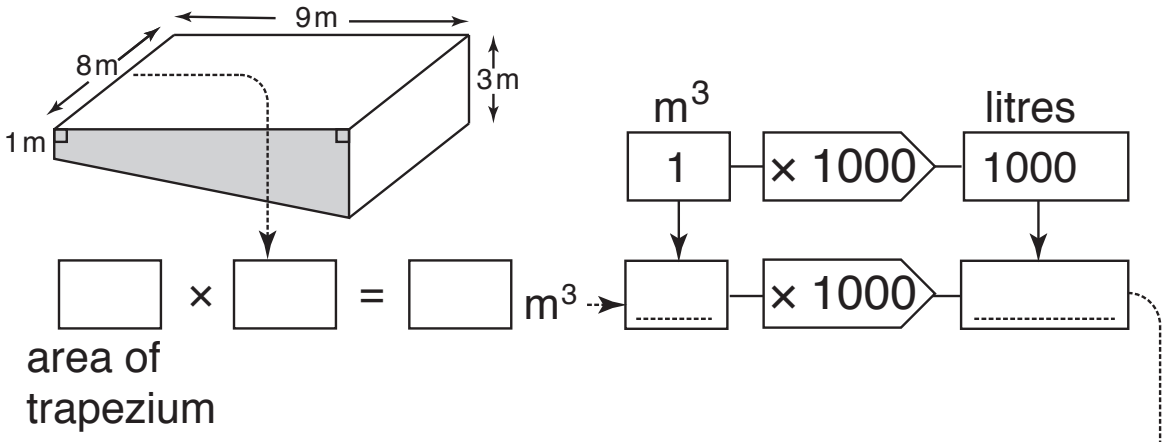
1a The diagram shows a rectangle and a trapezium.
Calculate the area of each shape.



1b The diagram shows a swimming pool.
The swimming pool is in the shape of a prism.
The cross-section is a trapezium.

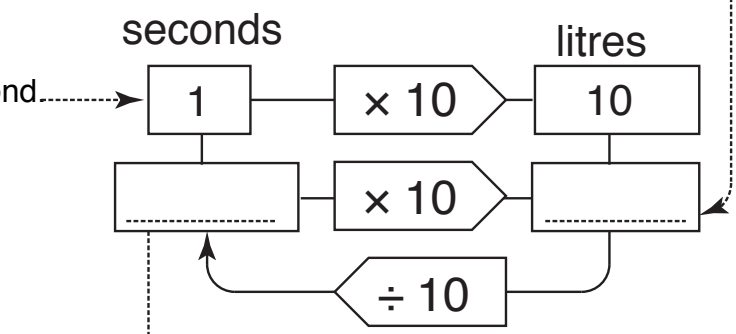
1 m^3 = 1000 litres.

Calculate the capacity of the swimming pool.

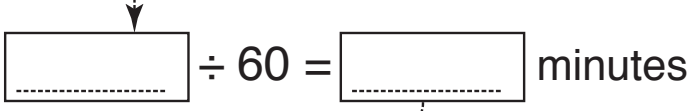


1c The swimming pool is filled with water at a rate of 10 litres per second.

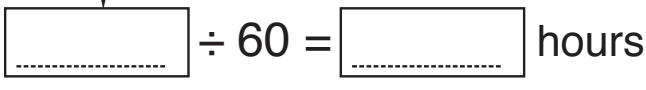
Work out how many seconds it takes to fill the pool.



1d Work out how many minutes it takes to fill the pool.



1e Work out how many hours it takes to fill the pool.



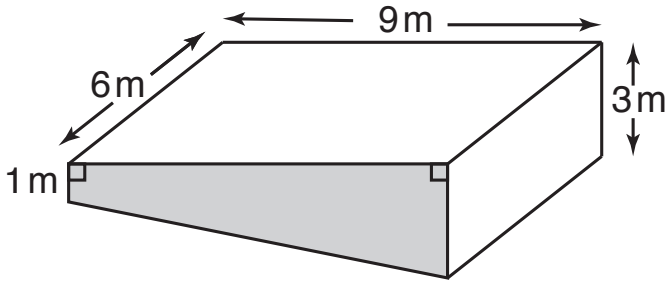
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8.7 Volume and rate of filling advanced: Test

F/H

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1



Filled at
2 litres per second

The diagram shows a swimming pool.
The swimming pool is in the shape of a prism.
The cross-section is a trapezium.
The swimming pool is filled with water at the rate of 2 litres per second.

Sophie has 16 hours to fill the swimming pool.

1 m^3 = 1000 litres.

Will Sophie completely fill the swimming pool in under 16 hours?
You must show all your working.

Answer _____

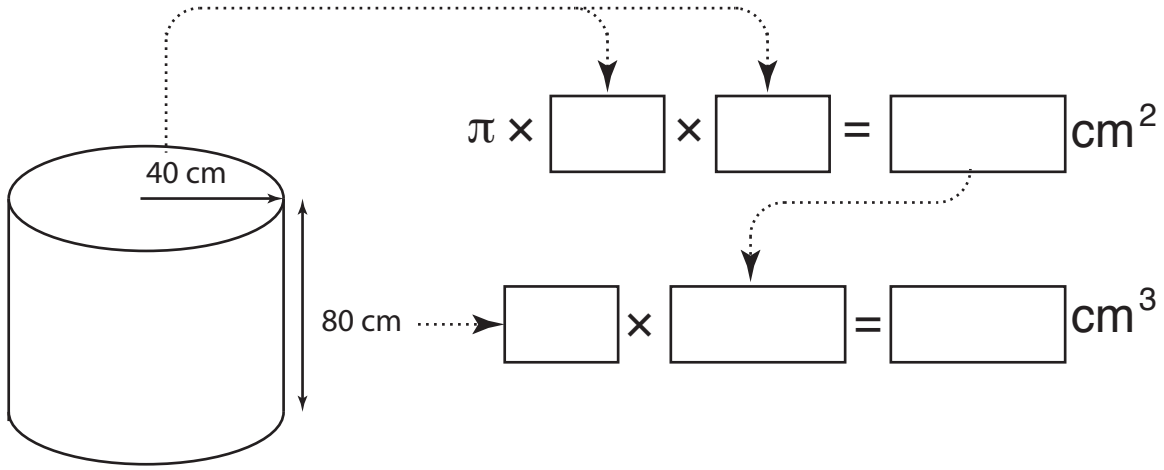
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8.8 Volume & filling cylinders introduction 1

F/H

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1a A water tank is a cylinder with radius 40 cm and depth 80 cm.
Calculate the volume of the cylinder.



1 b 1 litre = 1000 cm^3

Convert the volume of the cylinder to litres.

Answer _____

1 c The water tank is filled at a rate of 0.5 litres per second.
How many seconds does it take to fill the tank?

☐ ÷ 0.5 = ☐ seconds

1 d How many minutes does it take to fill the tank?
Give your answer to the nearest minute.

☐ ÷ 60 = ☐ minutes

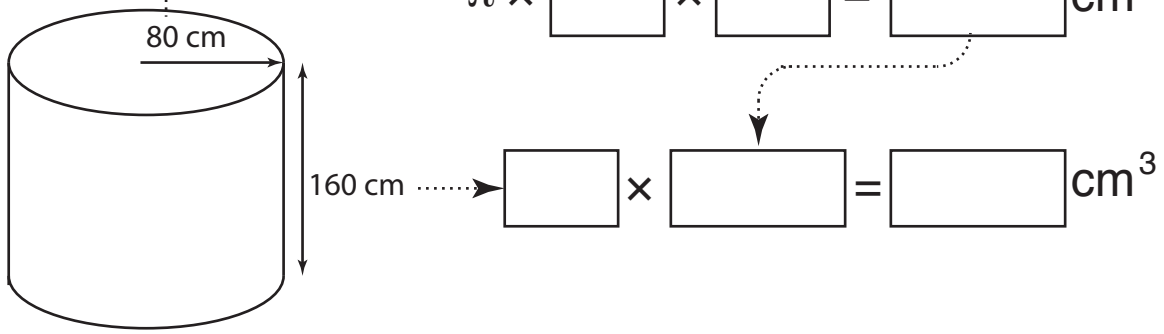
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8.8 Volume & filling cylinders introduction 2

F/H

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1a A water tank is a cylinder with radius 80 cm and depth 160 cm.
Calculate the volume of the cylinder.



1 b 1 litre = 1000 cm^3

Convert the volume of the cylinder to litres.

Answer _____

1 c The water tank is filled at a rate of 0.5 litres per second.
How many seconds does it take to fill the tank?

☐ ÷ 0.5 = ☐ seconds

1 d How many minutes does it take to fill the tank?
Give your answer to the nearest minute.

☐ ÷ 60 = ☐ minutes

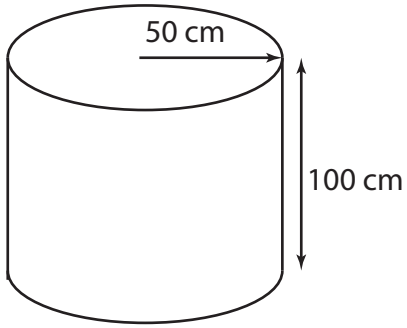
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8.8 Volume & filling cylinders introduction: Test

F/H

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1 A water tank is a cylinder with radius 50 cm and depth 100 cm.



It is filled at the rate 0.2 litres per second.

1 litre = 1000 cm

How many minutes does it take to fill the tank?

Answer _____

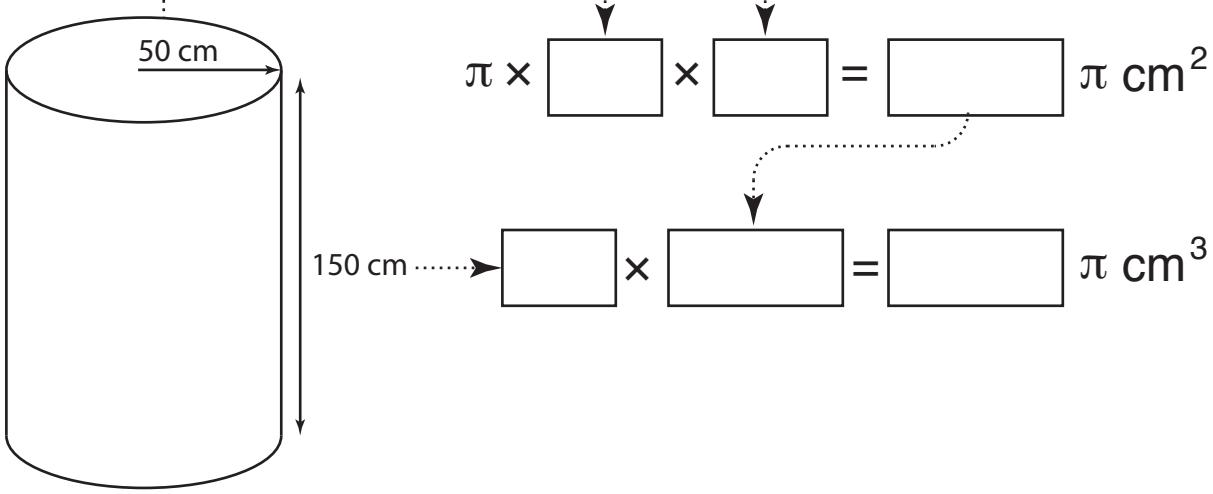
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8.9 Volume & filling cylinders advanced 1

F/H

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1a A water tank is a cylinder with radius 50 cm and depth 150 cm.
Calculate the volume of the cylinder. Give your answer in terms of π.



1 b 1 litre = 1000 cm^3

Convert the volume of the cylinder to litres. Give your answer in terms of π.

Answer _____

1 c The water tank is filled at a rate of 0.2 litres per second.
How many seconds does it take to fill the tank?

☐ ÷ 0.2 = ☐ seconds

1 d How many minutes does it take to fill the tank?
Give your answer to the nearest minute.

☐ ÷ 60 = ☐ minutes

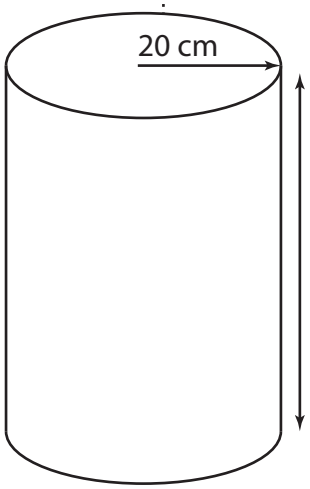
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8.9 Volume & filling cylinders advanced 2

F/H

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1a A water tank is a cylinder with radius 20 cm and depth 60 cm.
Calculate the volume of the cylinder. Give your answer in terms of π.



π × ☐ × ☐ = ☐ π cm²

☐ × ☐ = ☐ π cm³

1 b 1 litre = 1000 cm³

Convert the volume of the cylinder to litres. Give your answer in terms of π.

Answer _____

1 c The water tank is filled at a rate of 0.2 litres per second.
How many seconds does it take to fill the tank?

☐ ÷ 0.2 = ☐ seconds

1 d How many minutes does it take to fill the tank?
Give your answer to the nearest minute.

☐ ÷ 60 = ☐ minutes

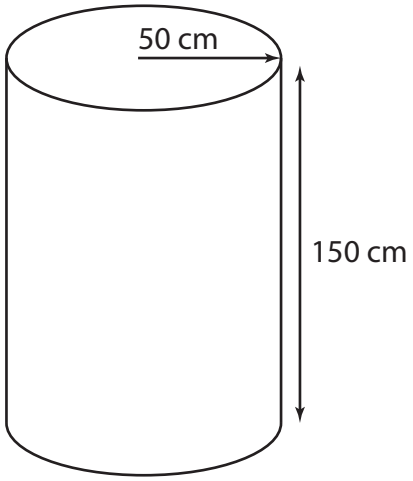
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8.9 Volume & filling cylinders advanced: Test

F/H

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1 A water tank is a cylinder with radius 50 cm and depth 150 cm.



It is filled at the rate 0.5 litres per second.

1 litre = 1000 cm

How many minutes does it take to fill the tank?

Answer _____

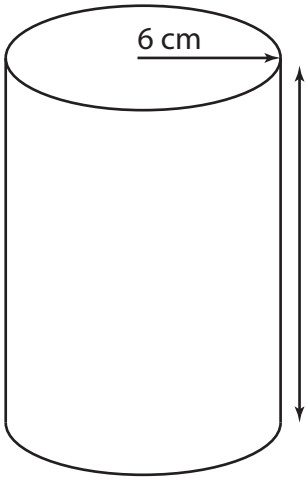
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8.10 Volume & filling cylinders extension 1

F/H

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1a Jane has some flowerpots in the shape of a cylinder of height 18 cm and radius 6 cm.
Calculate the capacity of one flowerpot.



$\pi \times \square \times \square = \square$ cm^2

$\square \times \square = \square$ cm^3

$\square \div 1000 = \square$ litres

1b Jane has a 12 litre bag of compost.
She fills each flowerpot completely.
How many flowerpots can she fill completely?

$12 \div \square = \square$

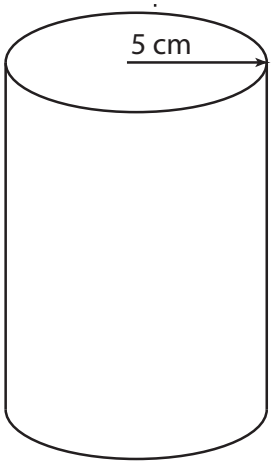
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8.10 Volume & filling cylinders extension 2

F/H

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1a Nicola has some flowerpots in the shape of a cylinder of height 14 cm and radius 5 cm.
Calculate the capacity of one flowerpot.



$\pi \times \square \times \square = \square$ cm^2

$\square \times \square = \square$ cm^3

$\square \div 1000 = \square$ litres

1b Nicola has a 10 litre bag of compost.
She fills each flowerpot completely.
How many flowerpots can she fill completely?

$10 \div \square = \square$

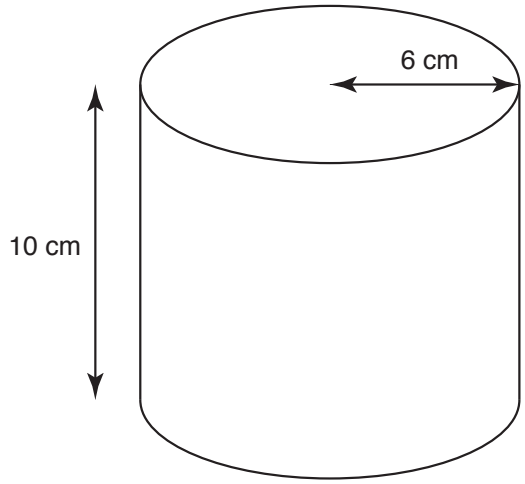
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8.10 Volume & filling cylinders extension: Test

F/H

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1 Sandra fills some empty flowerpots completely with compost.



Each flowerpot is in the shape of a cylinder of **height 10 cm** and r**adius 6 cm**.
She has a **10 litre bag** of compost.

She fills up each flowerpot completely.
How many flowerpots can she fill completely?

Answer _____

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9 Money

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9.1 Money and buying things introduction 1

F

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1 Here are the charges at a café.

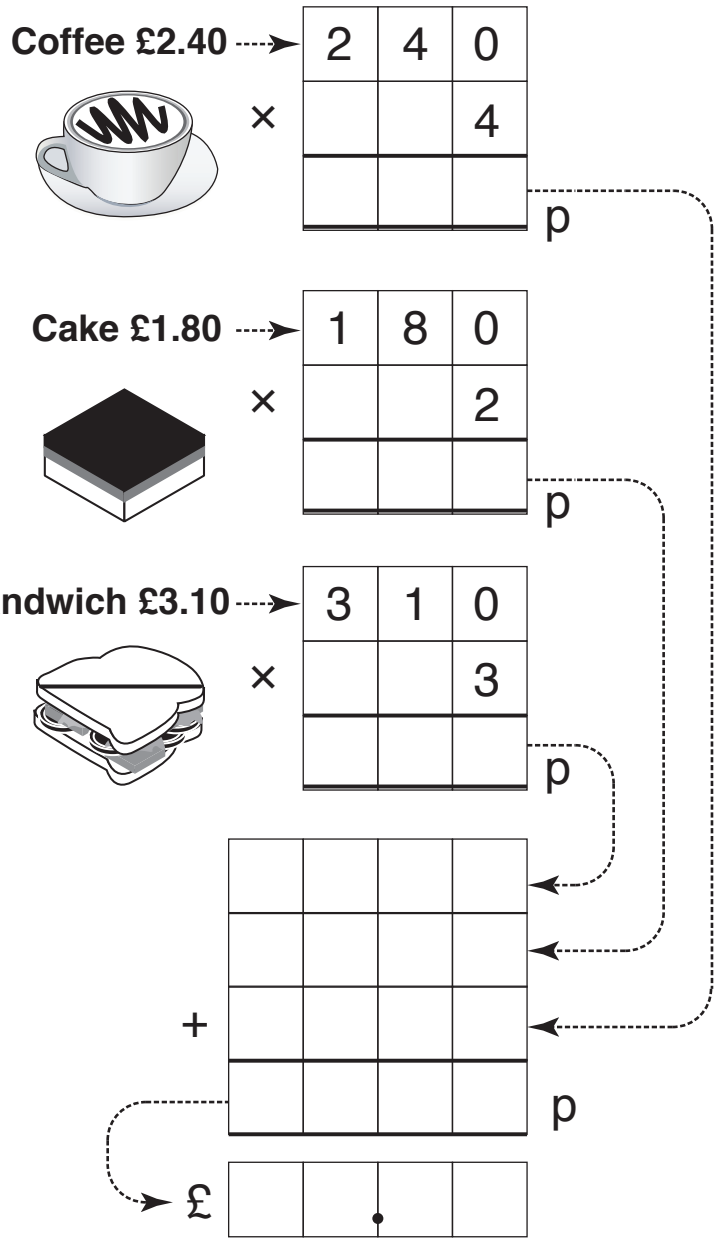


1a John buys **4** coffees.
Work out the cost.

1b John buys **2** cakes.
Work out the cost.

1c John buys **3** sandwiches.
Work out the cost.

1d Work out the total cost.



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9.1 Money and buying things introduction 2

F

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1 Here are the charges at a café.



1a Daniel buys **3** coffees.
Work out the cost.

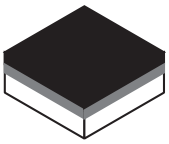


Coffee £2.40 ⟶

	2	4	0
×			3

p

1b Daniel buys **3** cakes.
Work out the cost.



Cake £1.80 ⟶

	1	8	0
×			3

p

1c Daniel buys **2** sandwiches.
Work out the cost.



Sandwich £3.10 ⟶

	3	1	0
×			2

p

1d Work out the total cost.

+				
				p
£		.		

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9.1 Money and buying things introduction: Test

F

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1 Here are the charges at a café.



Holly buys

4 coffees at	£2.30 each
3 cakes at	£1.70 each
2 sandwiches at	£3.40 each

Work out the total cost.

Answer £ _____

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9.2 Money and buying things next steps 1

F

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1 Here are the charges at a café.



1a Alan buys **3** teas.
Work out the cost.

Tea £1.80 →

	1	8	0
×			3
			p

1b Alan buys **2** coffees.
Work out the cost.

Coffee £2.15 →

	2	1	5
×			2
			p

1c Alan buys **5** sandwiches.
Work out the cost.

Sandwich £3.15 →

	3	1	5	
×			5	
				p

1d Work out the total cost.

+				
				p

1e Alan shares the cost equally between 5 people.
How much does each person pay?

5				
£		.		

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9.2 Money and buying things next steps 2

F

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1 Here are the charges at a café.



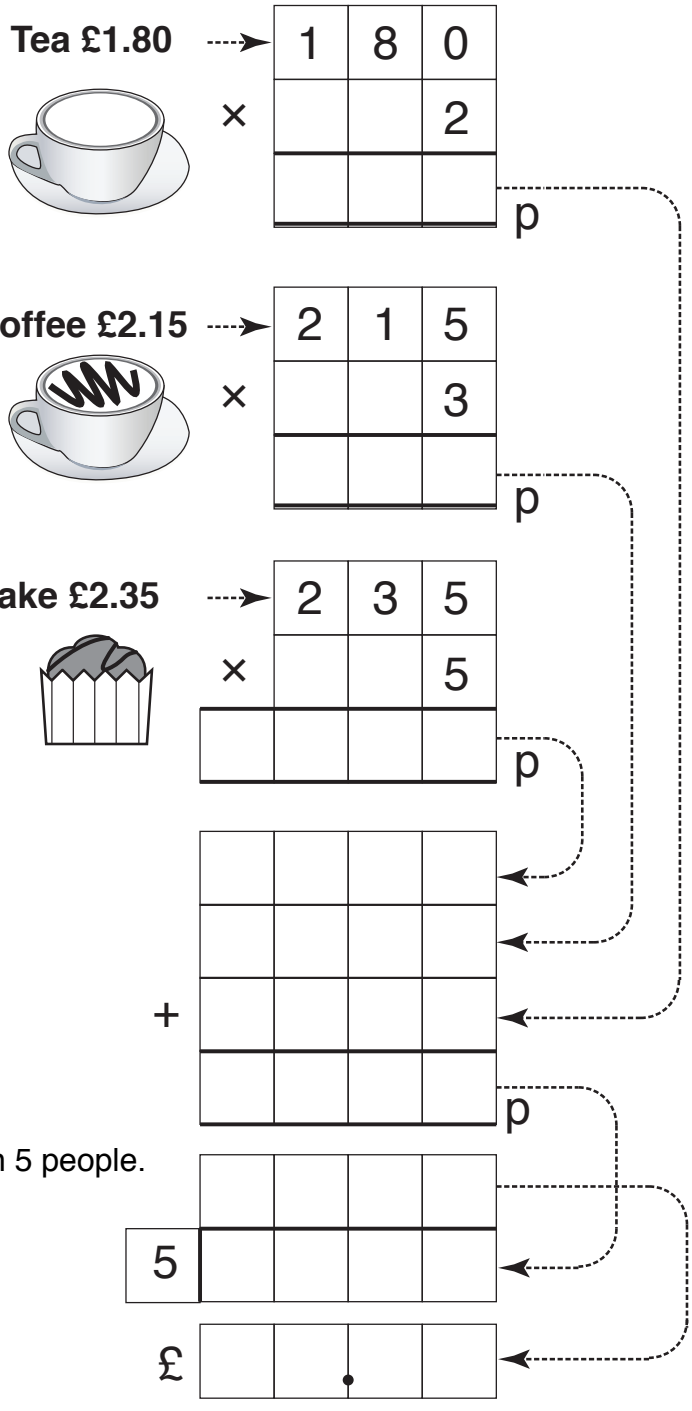
1a Joe buys **2** teas.
Work out the cost.

1b Joe buys **3** coffees.
Work out the cost.

1c Joe buys **5** cakes.
Work out the cost.

1d Work out the total cost.

1e Joe shares the cost equally between 5 people.
How much does each person pay?



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9.2 Money and buying things next steps: Test

F

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1 Here are the charges at a café.

		
Tea £1.90	**Coffee £2.05**	**Cake £2.45**

Emily buys

3 teas at	£1.90 each
2 coffees at	£2.05 each
5 cakes at	£2.45 each

Emily shares the cost equally between 5 people.
How much does each person pay?

Answer £ _____

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9.3 Money and buying things advanced 1

F

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1a Meg buys some shopping.

She pays with a £5 note.
She gets 40p change.

Work out the total cost of Meg's shopping.

	5	0	0
−		4	0

1b Meg buys
one magazine costing £2.40
and one bottle of orange costing 90p
Work out the total cost.





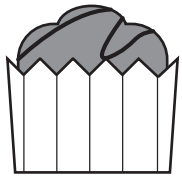
£2.40 90p

	2	4	0
+		9	0

1c Meg also buys a cake.
Work out the cost of the cake.







£2.40 90p

−			
£		.	

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9.3 Money and buying things advanced 2

F

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1a Jill buys some shopping.

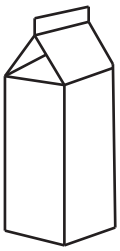
She pays with a £5 note.
She gets 60p change.

Work out the total cost of Jill's shopping.

	5	0	0
−		6	0

1b Jill buys
one magazine costing £2.40
and one carton of milk costing £1.10
Work out the total cost.



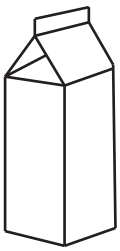


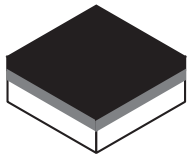
£2.40 £1.10

	2	4	0
+	1	1	0

1c Jill also buys a cake.
Work out the cost of the cake.







£2.40 £1.10

−			
£		.	

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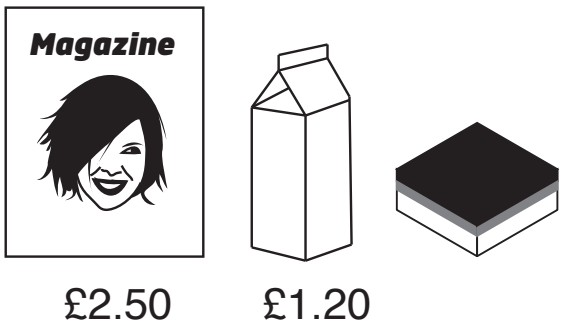
9.3 Money and buying things advanced: Test

F

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1 Emily buys

one magazine costing £2.50
one carton of milk costing £1.20
one cake



She pays with a £5 note.
She gets 40p change.

Work out the cost of one cake.

Answer £ _____

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9.4 Money and buying things extension 1

F

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1a Jane buys some shopping.

She pays with a £5 note.
She gets 20p change.

Work out the total cost of Jane's shopping.

	5	0	0
−		2	0

1b Jane buys
one sandwich costing £2.15
one bottle of orange costing 95p
Work out the total cost.



£2.15



95p

	2	1	5
+		9	5

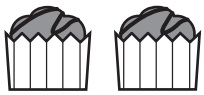
1c Jane also buys two cakes.
Work out the cost of one cake.



£2.15



95p



−			
2			
£		.	

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9.4 Money and buying things extension 2

F

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1a Holly buys some shopping.

She pays with a £5 note.
She gets 60p change.

Work out the total cost of Holly's shopping.

	5	0	0
−		6	0

1b Holly buys
one sandwich costing £1.85
one bottle of orange costing 95p
Work out the total cost.



£1.85



95p

	1	8	5
+		9	5

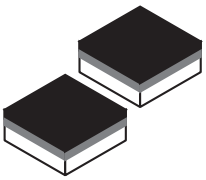
1c Holly also buys two cakes.
Work out the cost of one cake.



£1.85



95p



−			
2			
£		.	

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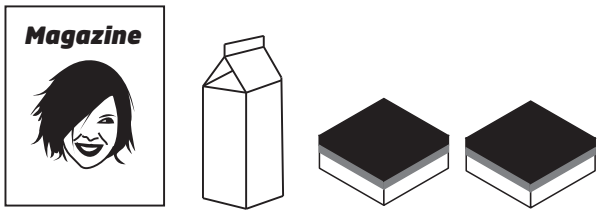
9.4 Money and buying things extension: Test

F

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1 Kate buys

one magazine costing £2.35
one carton of milk costing £1.05
two cakes



£2.35 £1.05

She pays with a £5 note.
She gets 20p change.

Work out the cost of one cake.

Answer £ _____

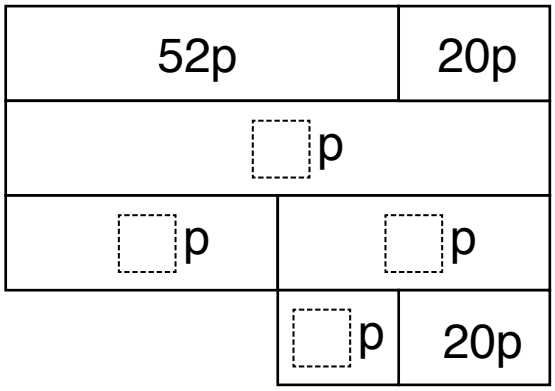
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9.5 Money and sharing 1

F

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1



James has **52p**
Kim has **20p**

Work out the total amount of money.

Share the money equally.

How much does James give to Kim?

.....

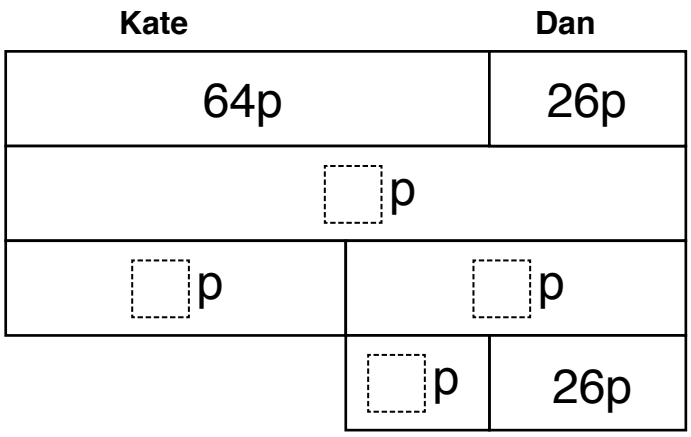
.....

.....

.....

Answer ..... p

2



Kate has **64p**
Dan has **26p**

Work out the total amount of money.

Share the money equally.

How much does Kate give to Dan?

.....

.....

.....

.....

Answer ..... p

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9.5 Money and sharing 2

F

Licensed to The King's School, Devon

1 Jon has **78p**
Nat has **£3.52**

1 a Write £3.52 in pence.

Answer ..... p

1 b How much money do Jon and Nat have in total?

.....

.....

.....

Answer ..... p

1 c Share the total amount of money so that they both have the same amount.

.....

.....

.....

Answer £ .....

1 d Calculate the amount Nat gave to Jon.

.....

.....

.....

Answer £ .....

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9.5 Money and sharing: Test

F

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1 Adam has **£1.20**
Daniel has **£4.50**
Daniel gives Adam some money so that they both have **the same** amount.
How much does Daniel give Adam?

.....

.....

.....

.....

Answer £ .....

2 Darren has **64p**
Mary has **£7.56**
Mary gives Darren some money so that they both have **the same** amount.
How much does Mary give Darren?

.....

.....

.....

.....

Answer £ .....

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9.6 Money and bills introduction 1

F

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1 a In **May** phone calls to the USA cost **25p** per minute.
John made **5 minutes** of calls to the USA.
Work out the total cost of the calls.



Calls to the USA
25p per minute

	2	5
×		5

p

1 b In **June** phone calls to the USA cost **30p** per minute.
John made **6 minutes** of calls to the USA.
Work out the total cost of the calls.



Calls to the USA
30p per minute

	3	0
×		6

p

1 c How much more did John pay for calls to the USA in **June**?

−			
			p
£		.	

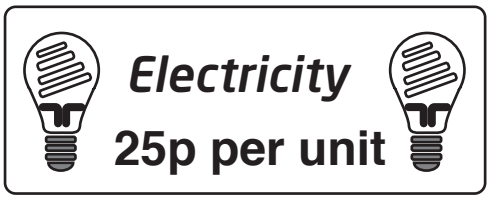
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9.6 Money and bills introduction 2

F

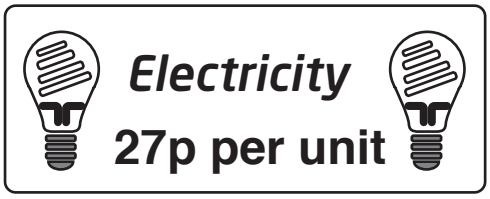
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1 a In **September** electricity cost **25p** per unit.
A family used **431** units.
How much money did the family pay for electricity in **September**?



		4	3	1
	×		2	5
+				
				p

1 b In **October** electricity cost **27p** per unit.
A family used **451** units.
How much money did the family pay for electricity in **October**?



		4	5	1
	×		2	7
+				
				p

1 c How much **more** did the family pay for electricity in **October**?

−					
					p
£			.		

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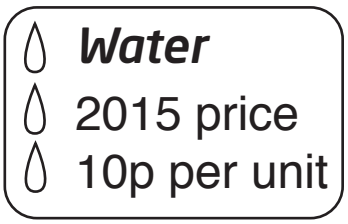
9.6 Money and bills introduction: Test

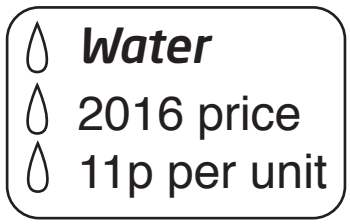
F

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1 In 2015 water cost **10p** per unit.
A family used **4195** units.

In 2016 water cost **11p** per unit.
The family used **4245** units.





How much more did the family pay for water in **2016**?

Answer _____

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9.7 Money and bills next steps 1

F

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1 In April, Daniel pays the same amount for each film he downloads.
He pays **£30** for **5 films**.

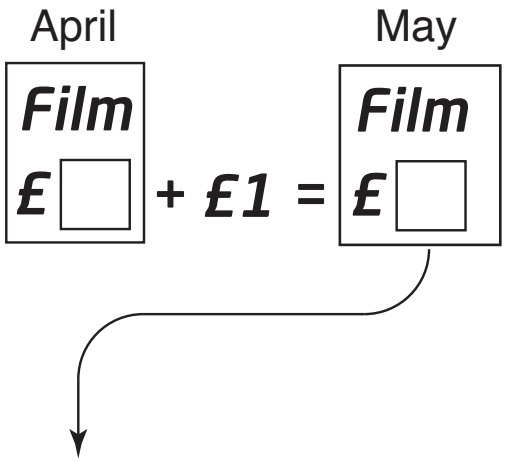
1 a How much did Daniel pay for one film in April?



Answer £ _____

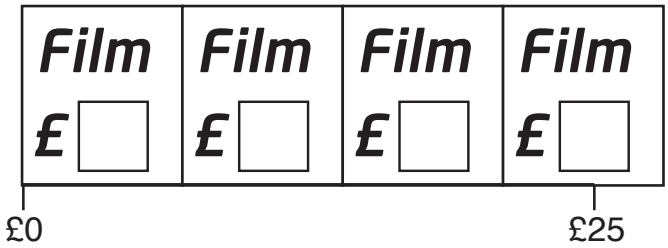
1 b In May each film costs £1 more than it did in April.

How much does one film cost in May?



Answer £ _____

1 c What is the **maximum** number of films Daniel can download in May using a £25 voucher?



Answer _____

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9.7 Money and bills next steps 2

F

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1 In August, Jill pays the same amount for each film she downloads.
She pays **£39.95** for **5 films**.

1 a How much did Jill pay for one film in August?

Answer £ _____

1 b In September, Jill pays **10p more** for each film.
How much does one film cost in September?

Answer £ _____

1 c What is the **maximum** number of films she can download in September using a £40 voucher?

Answer _____

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9.7 Money and bills next steps: Test

F

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1 In April, Sarah pays the same amount for each book.
She pays **£11.25** for **5 books**.

In May, she pays **20p more** for each book.
She has **£12.**

What is the **maximum** number of books she can buy in May for £12?

Answer _____

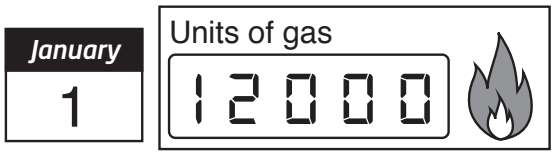
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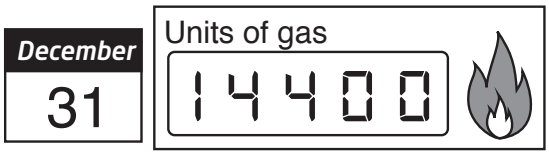
9.8 Money and bills advanced 1

F/H

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1 a Peter checks his gas meter.
At the **start** of the year, the gas meter reading was **12000** units.
At the **end** of the year, the gas meter reading was **15000** units.
Work out how many units of gas were used during the year.





Answer _____ units

1 b **Each** unit of gas costs **50p**.
Work out the **total** cost, in pence, of gas used.

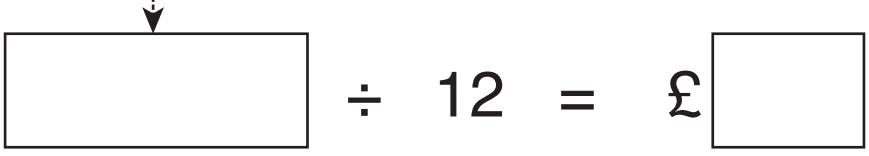


Answer _____ p

1 c Write your answer to question **1b** in pounds (£).

Answer £ _____

1 d Calculate the **mean** cost of gas that Peter used each **month**.



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9.8 Money and bills advanced 2

F/H

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1 Lisa works out the cost of the electricity she used last year.
At the start of the year, the electricity meter reading was **13778** units.
At the end of the year, the electricity meter reading was **15456** units.
Each unit of electricity she used cost **42p**.

1 a Work out the total amount of units Lisa used last year.

Answer _____ units

1 b Use your answer from question **1b** to calculate the total cost for a year.

Answer £ _____

1 c Work out the mean cost per month of the gas she used last year.

Answer £ _____

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9.8 Money and bills advanced: Test

F/H

Licensed to The King's School, Devon

1 Brian works out the cost of the electricity he used last year.
At the start of the year, the electricity meter reading was **14568** units.
At the end of the year, the electricity meter reading was **16746** units.
Each unit of electricity he used cost **42p**.

Work out the **mean** cost per **month** of the electricity he used last year.

Answer £ _____

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10 Planning

Licensed to The King's School, Devon

10.1 Planning and remainders introduction 411

10.2 Planning and remainders advanced 415

10.3 Planning and multiplication introduction 419

10.4 Planning and multiplication next steps 423

10.5 Planning and percentages 427

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10.1 Planning and remainders introduction 1

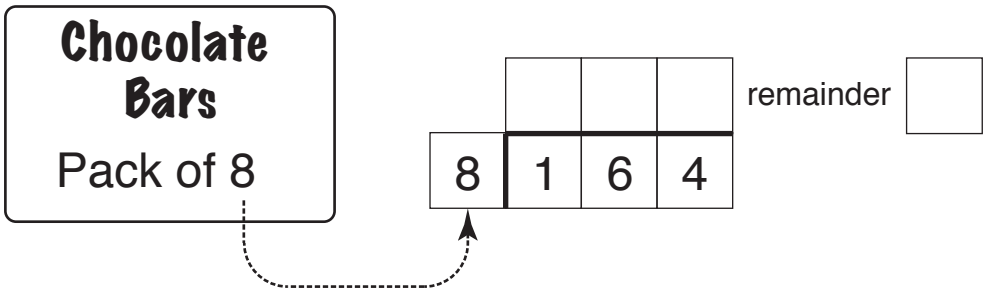
F

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1 Dave needs to buy chocolate bars for all the children in Year 7
Each of the 164 children get one chocolate bar.

There are 8 chocolate bars in each packet.

1a Calculate 164 ÷ 8



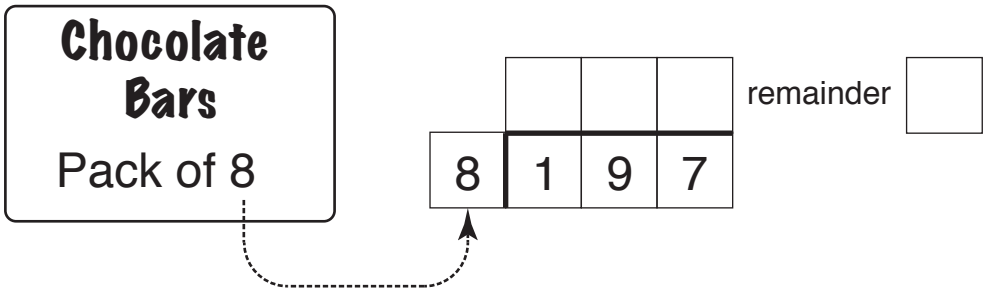
1b Work out the least number of packets of chocolate bars Dave needs to buy.

Answer _____

2 John needs to buy chocolate bars for all the children in Year 8
Each of the 197 children get one chocolate bar.

There are 8 chocolate bars in each packet.

1a Calculate 197 ÷ 8



1b Work out the least number of packets of chocolate bars John needs to buy.

Answer _____

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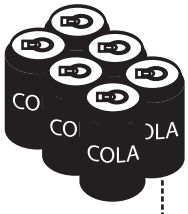
10.1 Planning and remainders introduction 2

F

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1 128 children go on a school trip.
Each student needs a can of cola.
Cola is sold in packs of 6

1a Calculate 128 ÷ 6



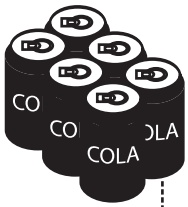
				remainder	
6	1	2	8		

1b Work out the least number of packs of cola needed.

Answer _____

2 135 children go on a school trip
Each student needs a can of cola.
Cola is sold in packs of 6

2a Calculate 135 ÷ 6



				remainder	
6	1	3	5		

2b Work out the least number of packs of cola needed.

Answer _____

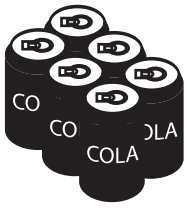
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10.1 Planning and remainders introduction: Test

F

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1 155 children go on a school trip.
Each student needs a can of cola.
Cola is sold in packs of 6



Work out the least number of packs of cola needed.

Answer _____

2 Chris needs to buy chocolate bars for all the children in Year 9
Each of the 172 children get one chocolate bar.

There are 8 chocolate bars in each packet.

Work out the least number of packets of chocolate bars that Chris needs to buy.

Answer _____

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10.2 Planning and remainders advanced 1

F

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Example

Here is a sign at a museum.

Museum

At *least*

1 adult for every 5 children

Adult				
C	C	C	C	C

How many adults are needed for 7 children?

Solution

2 adults are needed.

Adult					Adult	
C	C	C	C	C	C	C

1 Look at this diagram.

Adult					Adult					Adult				
C	C	C	C	C	C	C	C	C	C	C	C	C	C	C

Use the diagram to complete the table.

Children	Adults
1	1
2	1
3	
4	
5	
6	
7	
8	

Children	Adults
9	
10	2
11	
12	
13	
14	
15	

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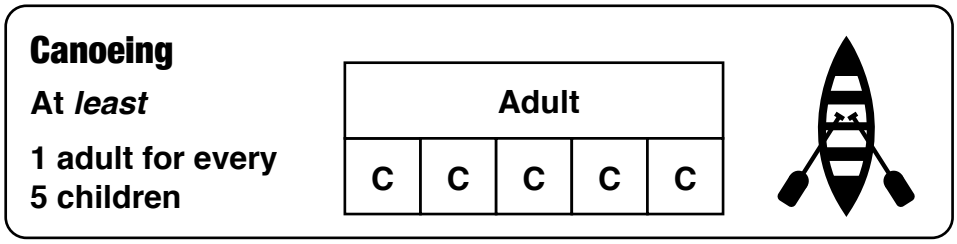
10.2 Planning and remainders advanced 2

F

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1 **24** children visit an activity centre.

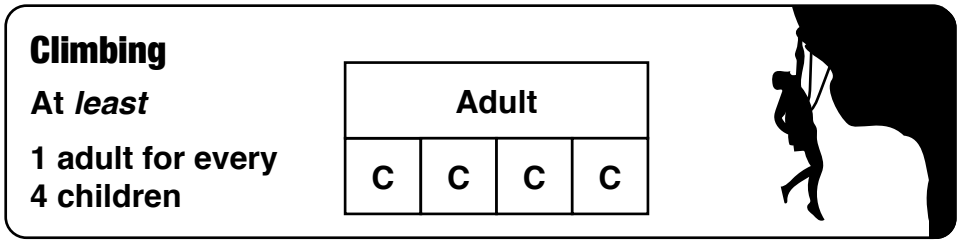
1 a Here is a sign for canoeing.



9 children go canoeing.
Work out the **minimum** number of adults needed for the children who go canoeing.

Answer _____

1 b Here is a sign for climbing.



15 children go climbing.
Work out the **minimum** number of adults needed for the children who go climbing.

Answer _____

1c Work out the **minimum** number of adults needed for all **24** children.

Answer _____

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10.2 Planning and remainders advanced: Test

F

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1 **80** Children visit a theme park.
32 of the children go on the Ferris Wheel.
At least one adult is needed for every **5 children** on the Ferris Wheel.

The other **48** children go on the Fun Slide.
At least **one** adult is needed for every **7 children** on the Fun Slide.

Work out the **minimum** number of adults needed for 80 children.

Answer _____

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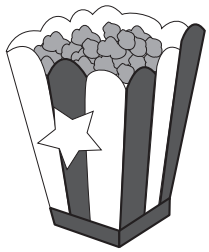
10.3 Planning and multiplication introduction 1

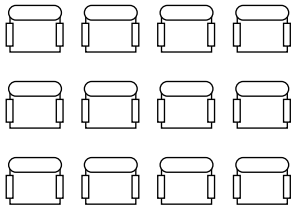
F

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1 A cinema has

3 rows of seats
4 seats in each row

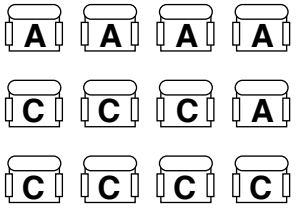




1 a How many seats there are in total?

☐ × ☐ = ☐ total seats

1 b The cinema has sold tickets for **every** seat.
7 child tickets were sold.
How many **adult** tickets were sold?



☐ − 7 = ☐

total seats — child seats — adult seats

1 c Here are the ticket prices

Adult £6
Child £4

How much money did the cinema get from **child** tickets?



£4 × ☐ = £ ☐

1d How much money did the cinema get from **adult** tickets?



£6 × ☐ = £ ☐

1e How much money did the cinema get in total?

☐ + ☐ = £ ☐

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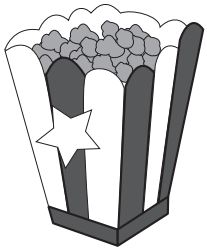
10.3 Planning and multiplication introduction 2

F

Licensed to The King's School, Devon

1 A cinema has

4 rows of seats
5 seats in each row



1 a How many seats there are in total?

□ × □ = □ total seats

1 b The cinema has sold tickets for **every** seat.
9 child tickets were sold.
How many **adult** tickets were sold?

□ − 9 = □

total seats | child seats | adult seats

1 c Here are the ticket prices

Adult £8
Child £5

How much money did the cinema get from **child** tickets?

£5 × □ = £□

1d How much money did the cinema get from **adult** tickets?

£8 × □ = £□

1e How much money did the cinema get in total?

□ + □ = £□

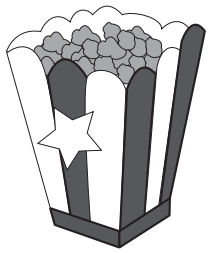
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10.3 Planning and multiplication introduction: Test

F

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1 A cinema has



6 rows of seats
5 seats in each row

Adult tickets are **£10** each.
Child tickets are **£7** each.
The cinema has sold tickets for **every** seat.

10 child tickets were sold.

Calculate the total amount that the cinema gets from ticket sales.

Answer £ _____

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10.4 Planning and multiplication next steps 1

F

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1a Kal makes 8 cups of coffee each day.
He thinks that he uses 2 g of coffee in each cup.
Calculate how much coffee Kal thinks he uses each day.

☐ × ☐ = ☐ g coffee each day

1b Calculate how much coffee Kal uses in **28** days.



	×	2 8
+		

☐ × 28 = ☐ g coffee for 28 days

1c Coffee comes in 200 g jars.
Kal wants to buy enough coffee for 28 days.

How many jars of coffee does Kal need to buy?
Tick a box.

Jars	Amoung (g)
1	200 g
2	400 g
3	600 g

☐ 1 jar ☐ 2 jars ☐ 3 jars

1d Kal finds that he uses 3 g of coffee for each cup.
How does this affect the number of jars of coffee he needs to buy?
Tick a box.

☐ He needs to buy **more** jars because he is using more coffee in each cup.

☐ He needs to buy **fewer** jars because he is using more coffee in each cup.

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10.4 Planning and multiplication next steps 2

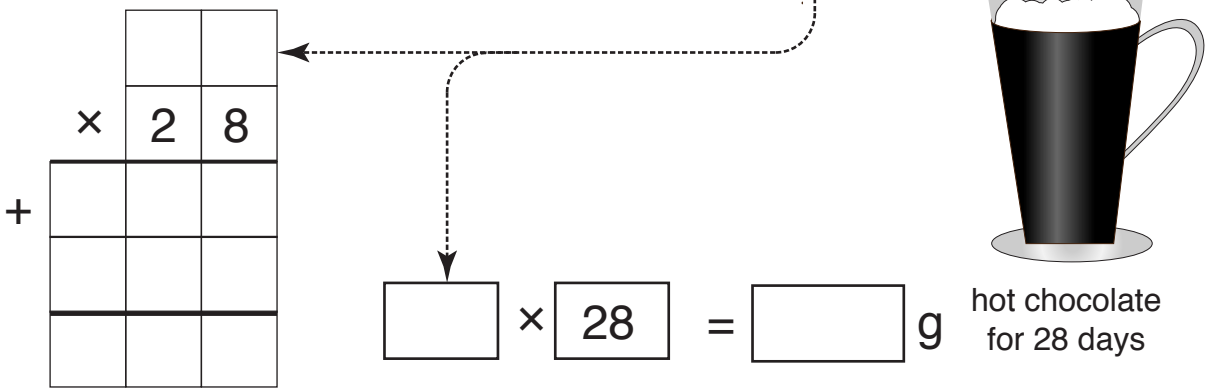
F

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1a Joe makes 3 cups of hot chocolate each day.
He thinks that he uses 5 g of hot chocolate in each cup.
Calculate how much hot chocolate Joe thinks he uses each day.

☐ × ☐ = ☐ g hot chocolate each day

1b Calculate how much hot chocolate Joe uses in **28** days.



1c Hot chocolate comes in 150 g jars.
Joe wants to buy enough hot chocolate for 28 days.
Complete the table.

Jars	Amoung (g)
1	150 g
2	
3	

How many jars of hot chocolate does Kal need to buy?
Tick a box.

☐ 1 jar ☐ 2 jars ☐ 3 jars

1d Joe finds that he uses 2.5 g of hot chocolate for each cup.
How does this affect the number of jars of hot chocolate he needs to buy?
Tick a box.

☐ He needs to buy **more** jars because he is using less hot chocolate in each cup.

☐ He needs to buy **fewer** jars because he is using less hot chocolate in each cup.

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10.4 Planning and multiplication next steps: Test

F

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1 Coffee is sold in jars.
There are 150 g of coffee in each jar.

Emma makes 6 cups of coffee each day.
She thinks that she uses 3 g of coffee to make each cup of coffee.

Emma wants to buy enough coffee for 28 days.

1a How many jars of coffee does Emma need to buy?

Answer _____

Emma finds that she uses 1 g of coffee to make each cup of coffee.

1b How does this affect the number of jars of coffee she needs to buy?
You must give a reason for your answer.

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10.5 Planning and percentages 1

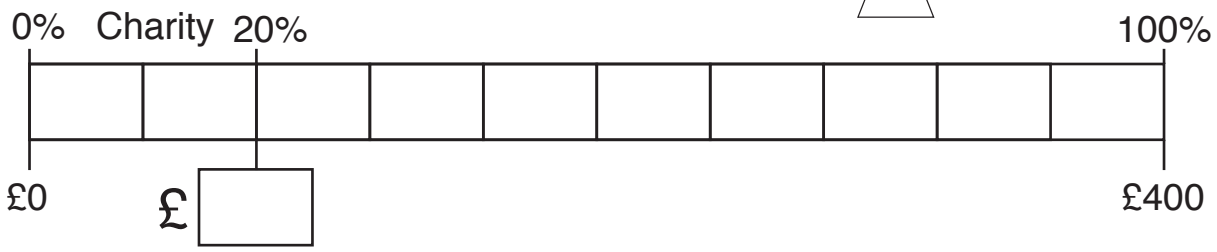
F

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1 Andrew wins £400 in a raffle.



1a He gives 20% of the £400 to charity.
Calculate how much money Andrew gives to charity.

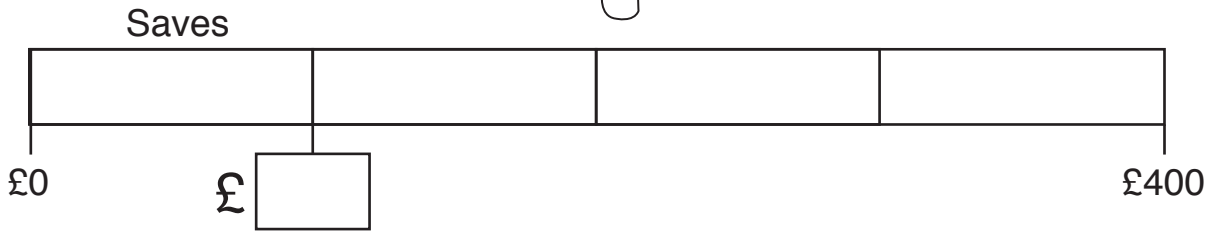


Answer £ _____

1b Andrew saves $\frac{1}{4}$ of the £400

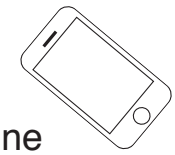


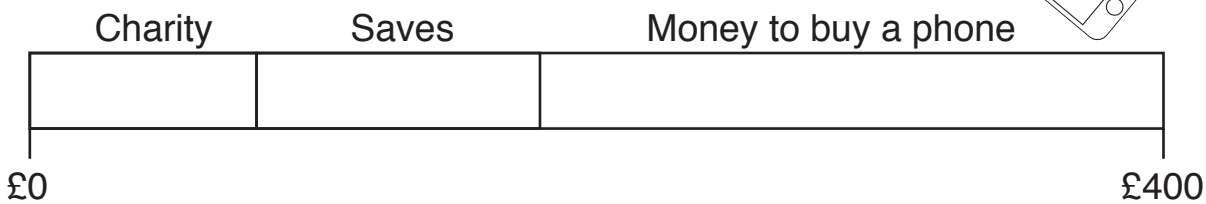
Calculate how much Andrew saves.



Answer £ _____

1c Andrew uses the rest of the money to buy a mobile phone.
Work out **how much of the money** Andrew uses to buy a phone.





Answer £ _____

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10.5 Planning and percentages 2

F

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1 Doug wins **£800** in a competition.
He gives **5%** of the **£800** to charity.
He saves $\frac{1}{4}$ of the **£800**.



1 a Doug gives 5% of the £800 to charity.
Work out 5% of the £800.

Answer £ _____

1 b Doug saves $\frac{1}{4}$ of the £800.
Work out $\frac{1}{4}$ of the £800.



Answer £ _____

1 c Doug uses the rest of the money for shopping.
Work out **how much of the money** Doug uses for shopping.



Answer £ _____

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10.5 Planning and percentages: Test

F

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1 Sarah wins **£500** in a competition.
She gives **25%** of the **£500** to charity.
She saves $\frac{1}{5}$ of the **£500**.

Sarah uses the rest of the money for shopping.
Work out **how much of the money** Sarah uses for shopping.

Answer _____

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11 Number properties

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11.9	Number properties prime numbers advanced	466
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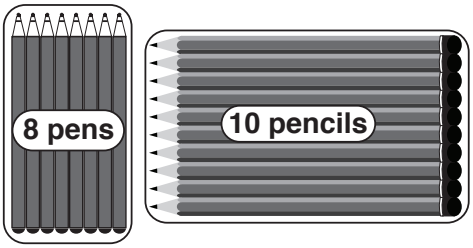
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11.1 Number Properties lcm introduction 1

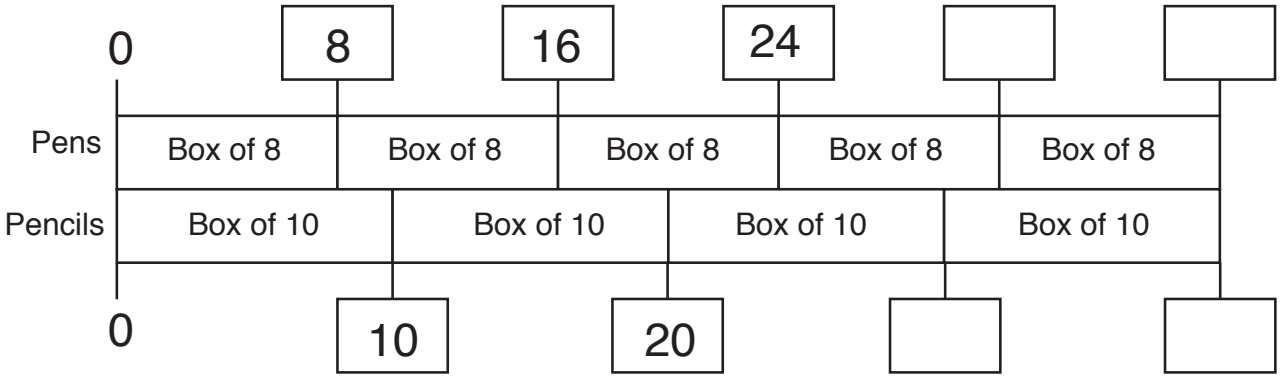
F/H

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1 Pens are sold in boxes of 8
Pencils are sold in boxes of 10



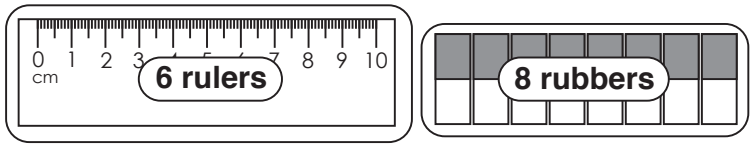
1 a Complete the diagram.



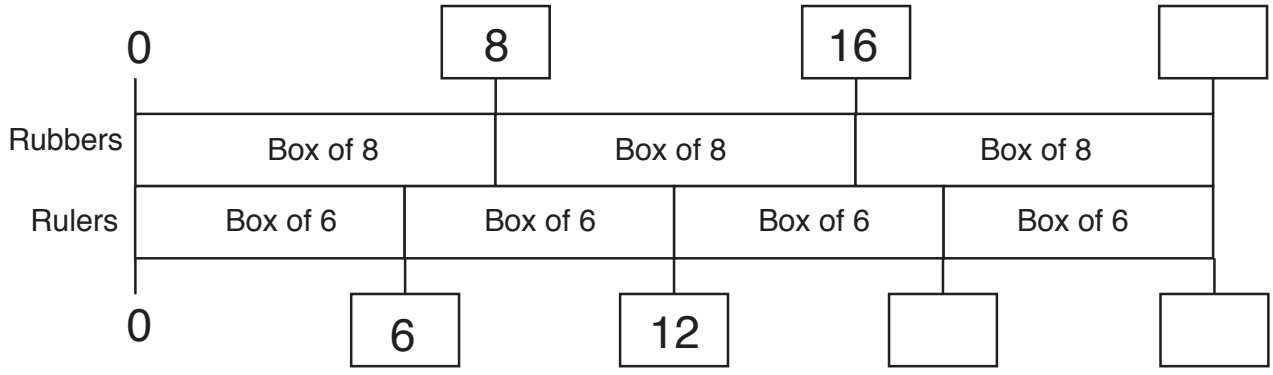
1 b A teacher wants to buy the same number of pens and pencils.
Write the smallest number of boxes of each item she could buy.

☐ boxes of pens ☐ boxes of pencils

2 Rulers are sold in boxes of 6
Rubbers are sold in boxes of 8



2 a Complete the diagram.



2 b A teacher wants to buy the same number of rulers and rubbers.
Write the smallest number of boxes of each item she could buy.

☐ boxes of rubbers ☐ boxes of rulers

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11.1 Number Properties lcm introduction 2

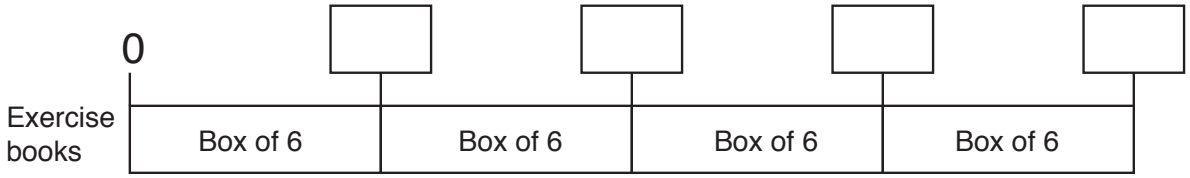
F/H

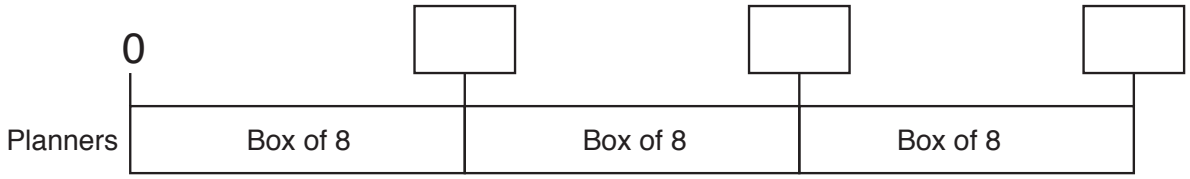
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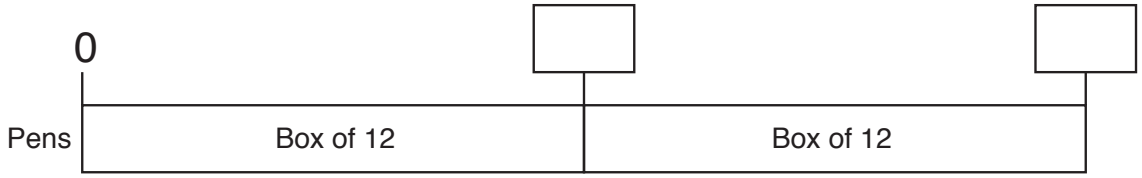
1 Exercise books are sold in boxes of 6
Planners are sold in boxes of 8
Pens are sold in boxes of 12

A teacher wants to buy the same number of exercise books, pens and planners.

1 a Complete the diagrams.







1 b A teacher wants to buy the same number of exercise books, planners and pens.
Write the smallest number of boxes of each item she could buy.

☐ boxes of exercise books

☐ boxes of planners

☐ boxes of pens

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11.1 Number Properties lcm introduction: Test

F/H

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1 Protractors are sold in boxes of 6
Rulers are sold in boxes of 10
Pens are sold in boxes of 12

A teacher wants to buy the same number of protractors, rulers and pens.

Work out the **smallest** number of boxes of each item he could buy.

Answer Boxes of protractors _____

Boxes of rulers _____

Boxes of pens _____

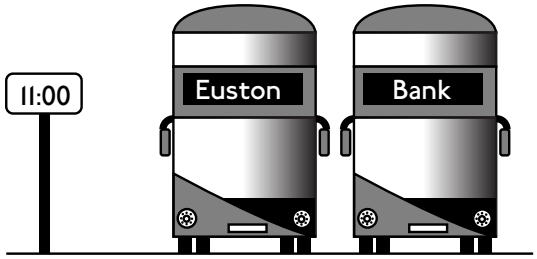
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11.2 Number Properties lcm advanced 1

F/H

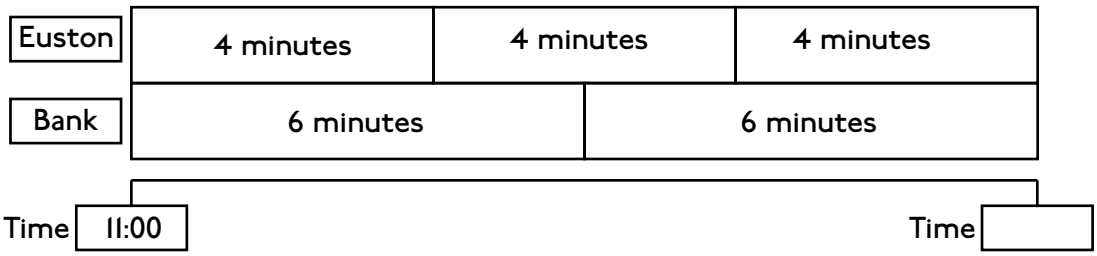
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1 Two busses are at a bus stop at 11: 00



Busses to Euston every 4 minutes
Busses to Bank every 6 minutes

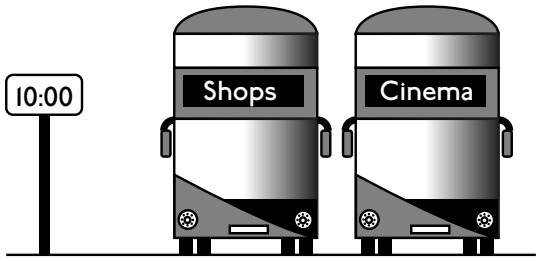
Look at the diagram.



What is the next time that the busses should be together at the bus stop?

Answer _____

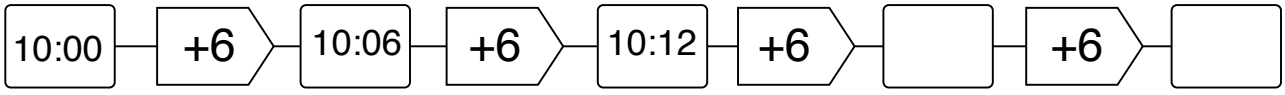
2 Two busses are at a bus stop at 10:00

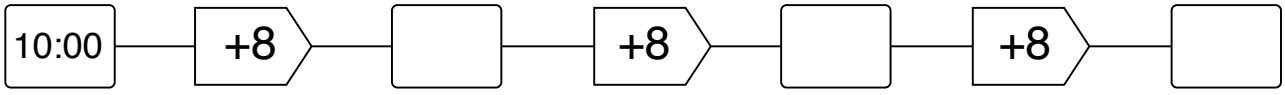


Busses to Shops every 6 minutes
Busses to Cinema every 8 minutes

2a Complete the diagrams.

Shops





Cinema

2b What is the next time that the busses should be together at the bus stop?

Answer _____

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11.2 Number Properties lcm advanced 2

F/H

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1 A chess competition takes place every **4 years**.
A table tennis competition takes place every **6 years**.

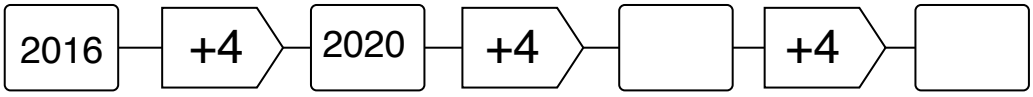




Both competitions took place in 2016

1 a Complete the diagram.

Chess



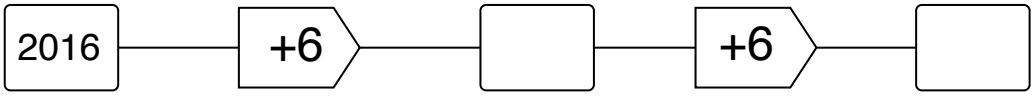


Table Tennis

1 b When is the next year after 2016 that **both** competitions will take place?

Answer _____

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11.2 Number Properties lcm: Test

F/H

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1 A **dance** competition takes place every **4 years**.
A **swimming** contest takes place every **3 years**.



Both contests took place in **2016**.

When is the next year after 2016 that **both** contests will take place?

Answer _____

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11.3 Number Properties multiples introduction 1

F

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1 Here are some multiples of 4

4 8 12 16 20

Choose numbers from the list to complete the calculation.

$\square + \square + \square = 28$

2 Here are some multiples of 3

3 6 9 12 15 18

Choose numbers from the list to complete the calculation.

$\square + \square + \square = 24$

3 Here are some multiples of 5

5 10 15 20 25 30

Choose numbers from the list to complete the calculation.

$\square + \square + \square = 35$

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11.3 Number Properties multiples introduction 2

F

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1 Here are some multiples of 6

6 12 18 24 30 36

Choose numbers from the list to complete the calculation.

$\square + \square + \square = 60$

2 a Write down the first six multiples of 8

Answer $\square$ $\square$ $\square$ $\square$ $\square$ $\square$

2 b Complete the calculation using multiples of 8

$\square + \square + \square = 80$

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11.3 Number Properties multiples introduction: Test

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1 Write down three different multiples of 6 that add up to 42

Answer _____ _____ _____

2 Write down three different multiples of 9 that add up to 90

Answer _____ _____ _____

3 Write down three different multiples of 7 that add up to 70

Answer _____ _____ _____

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11.4 Number Properties multiples advanced 1

F

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1 Here are the first three multiples of 9

9 18 27

Here are the factors of 40

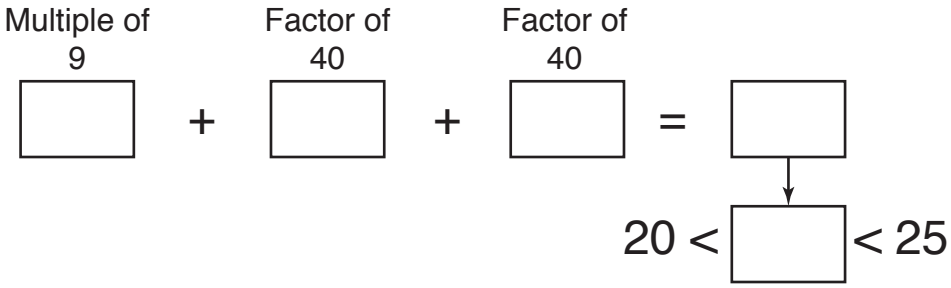
1 40 2 20 4 10 5 8

John chooses one multiple of 9 and two factors of 40.

He adds the numbers together.

His answer is greater than 20 but less than 25

Find three numbers that John could have chosen.



2 Here are the first three multiples of 7

7 14 21

Here are the factors of 40

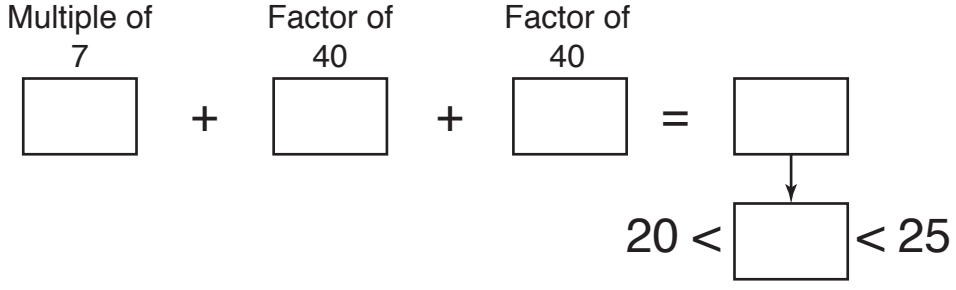
1 40 2 20 4 10 5 8

John chooses one multiple of 7 and two factors of 40.

He adds the numbers together.

His answer is greater than 20 but less than 25

Find three numbers that John could have chosen.



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11.4 Number Properties multiples advanced 2

F

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1a Write down the first four multiples of 11

Answer ☐ ☐ ☐ ☐

1b Write down the factors of 30

Answer

☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐

1c Toby chooses one multiple of 11 and two factors of 30

He adds the numbers together.

His answer is greater than 40 but less than 50

Find three numbers that Toby could have chosen.

Multiple of 11 ☐ + Factor of 30 ☐ + Factor of 30 ☐ = ☐

$40 < \square < 50$

1d Find a different set of three numbers that Toby could have chosen.

Multiple of 11 ☐ + Factor of 30 ☐ + Factor of 30 ☐ = ☐

$40 < \square < 50$

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11.4 Number Properties multiples advanced: Test

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1 Katie writes down

one multiple of 9
two factors of 50

Katie adds her three numbers.
Her answer is greater than 30 but less than 40

Find three numbers that she could have written down.

Answer _____ _____ _____

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11.5 Number Properties and algebra introduction 1

F

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1a Annie writes down two numbers.
The second number is three times the first number.

x	x	x	x
First number	The second number is three times the first number		

Here is an expression for the sum of the two numbers

$$4x$$

1a The sum of the two numbers is 24
Solve this equation

$$\square = 24$$

Answer _____

1b Calculate the value of the second number.

$$3 \times \square = \square$$

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11.5 Number Properties and algebra introduction 2

F

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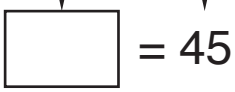
1a Phil writes down two numbers.
The second number is four times the first number.

x	x	x	x	x
First number	The second number is four times the first number			

Write an expression for the sum of the two numbers.

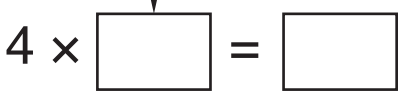
Answer _____

1b The sum of the two numbers is 45
Solve this equation



Answer _____

1c Calculate the value of the second number.



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11.5 Number Properties and algebra introduction: Test

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1 The sum of two numbers is 42
The second number is five times the first number.

Work out the two numbers.

Answer _____ _____

2 The sum of two numbers is 27
The second number is eight times the first number.

Work out the two numbers.

Answer _____ _____

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1a Kate writes down two numbers.

The second number is four times the first number.

x	x	x	x	x
First number	The second number is four times the first number			

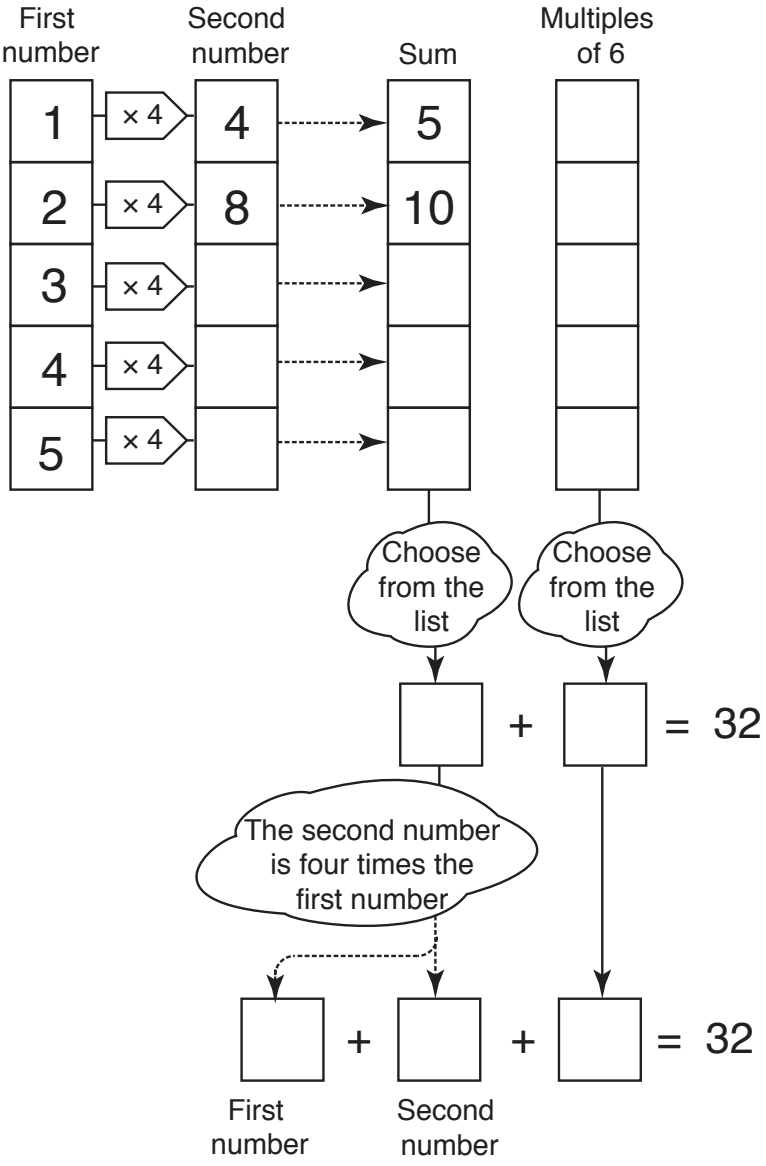
Write an expression for the sum of the two numbers.

Answer _____

1b Kate writes down a third number that is a multiple of 6

The sum of the three numbers is 32

Work out the three numbers.



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11.6 Number Properties and algebra advanced 2

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1a Kate writes down two numbers.

The second number is three times the first number.

x	x	x	x
First number	The second number is three times the first number		

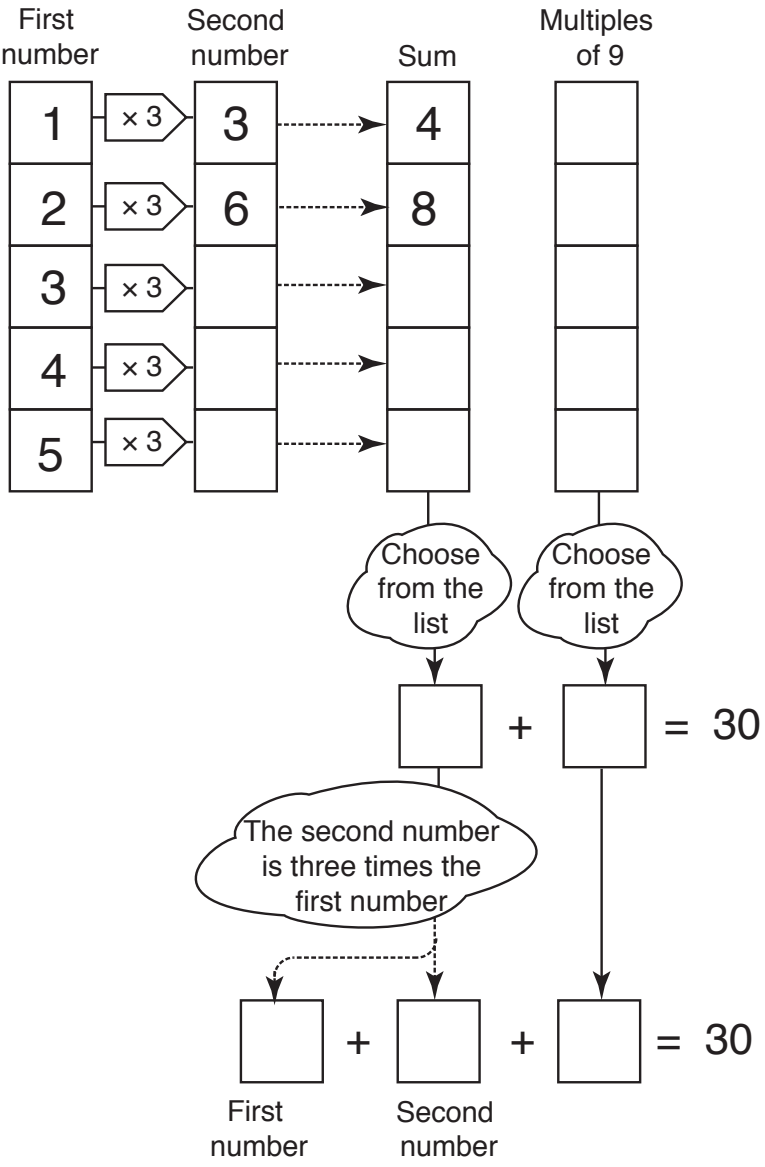
Write an expression for the sum of the two numbers.

Answer _____

1b Kate writes down a third number that is a multiple of 9

The sum of the three numbers is 30

Work out the three numbers.



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11.6 Number Properties and algebra advanced: Test

F/H

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1 The sum of three numbers is 40
The second number is five times the first number.
The third number is a multiple of 11
Work out the three numbers.

Answer _____ _____ _____

2 The sum of three numbers is 30
The second number is three times the first number.
The third number is a multiple of 7
Work out the three numbers.

Answer _____ _____ _____

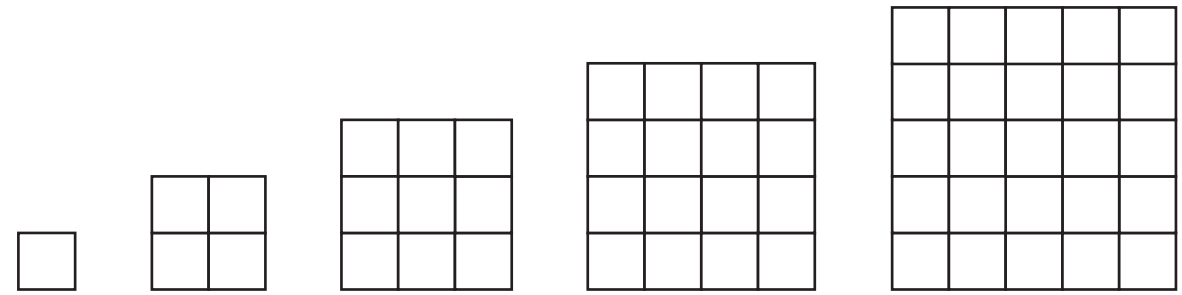
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11.7 Number Properties Square Numbers 1

F/H

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1 Here are the first five **square numbers**.



1 × 1 = 1 | 2 × 2 = 4 | 3 × 3 = 9 | 4 × 4 = 16 | 5 × 5 = 25

1a The **sum** of two square numbers is **20**
What are the two numbers?

□ + □ = 20

1b The **sum** of two square numbers is **26**
What are the two numbers?

□ + □ = 26

1c The **sum** of two square numbers is **29**
What are the two numbers?

□ + □ = 29

1d The **sum** of three square numbers is **29**
What are the three numbers?

□ + □ + □ = 29

1e The **sum** of three square numbers is **14**
What are the three numbers?

□ + □ + □ = 14

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11.7 Number Properties Square Numbers 2

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1 a Complete the table of square numbers.

1^2	2^2	3^2	4^2	5^2	6^2	7^2	8^2	9^2	10^2	11^2	12^2
1	4						64			121	144

1 b The **sum** of two square numbers is **40**
What are the two numbers?

☐ + ☐ = 40

1 c The **sum** of two square numbers is **80**
What are the two numbers?

☐ + ☐ = 80

1 d The **sum** of two square numbers is **130**
What are the two numbers?

☐ + ☐ = 130

1 e The **sum** of two square numbers is **160**
What are the two numbers?

☐ + ☐ = 160

1 f The **sum** of three square numbers is **147**
What are the three numbers?

☐ + ☐ + ☐ = 147

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11.7 Number Properties Square Numbers: Test

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1 The sum of **two** square numbers is 41
What are the two **square numbers**?

Answer _____

2 The sum of **three** square numbers is 190
What are the three **square numbers**?

Answer _____

3 The sum of **three** square numbers is 89
What are the three **square numbers**?

Answer _____

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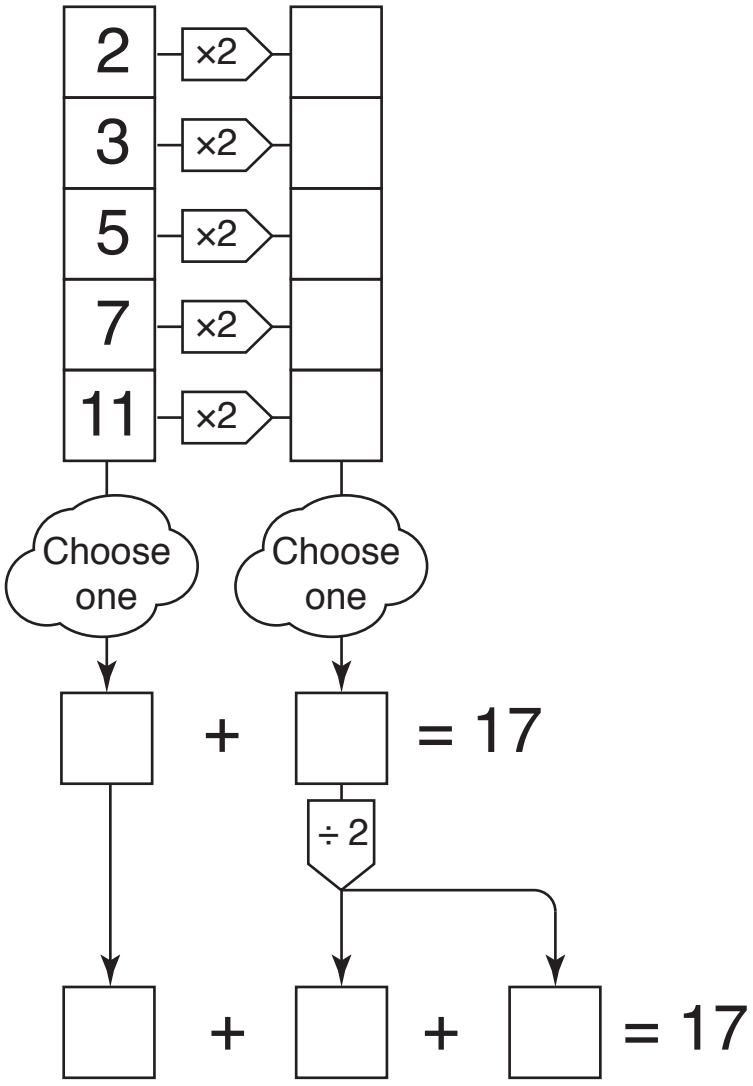
11.8 Number Properties Primes Introduction 1

F/H

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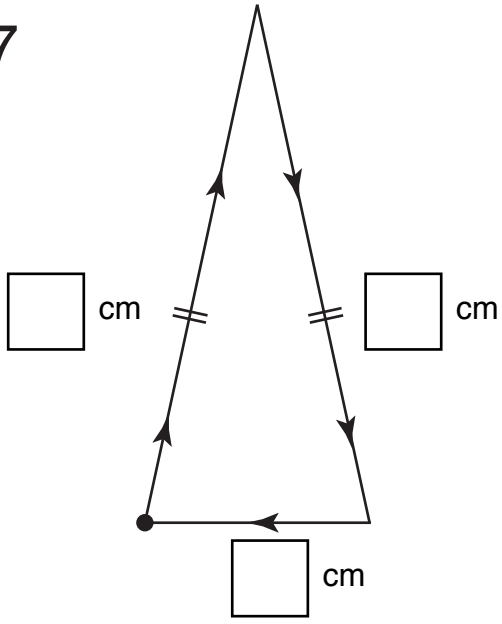
1 a Complete the diagram.

Prime numbers



1 b The **perimeter** of an isosceles triangle is **17 cm**
The **length** of each side, in cm, is a **prime number**.

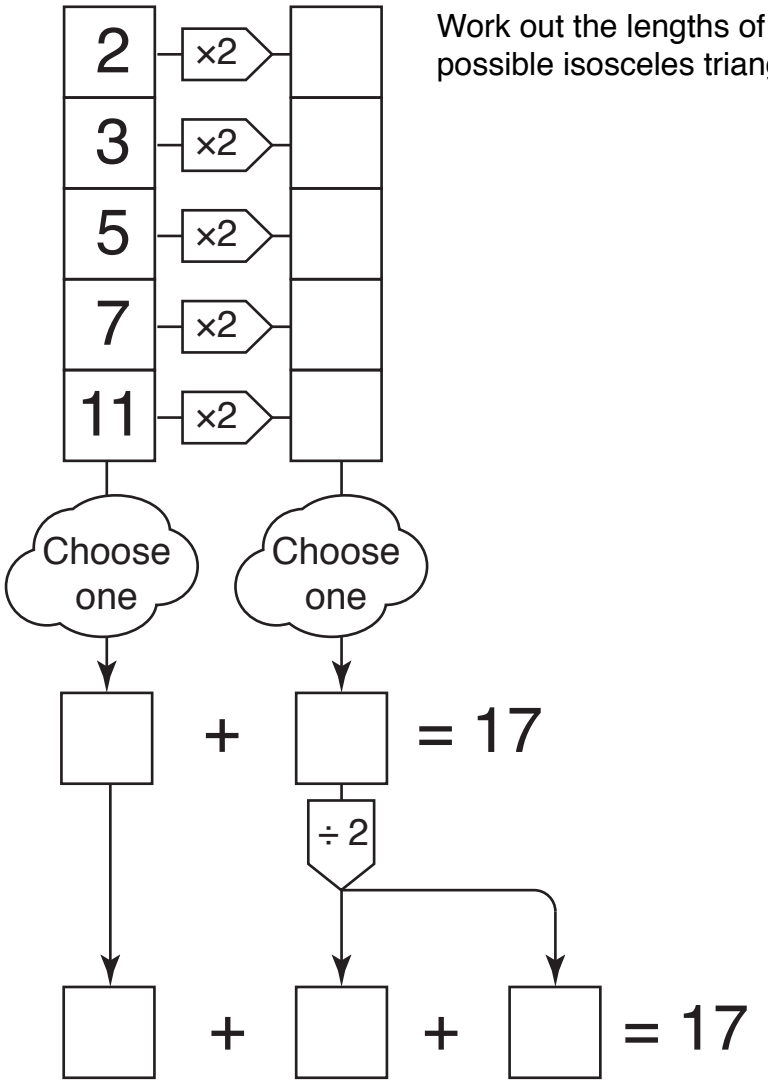
Write the length of each side on the isosceles triangle.



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1 c Complete the diagram.

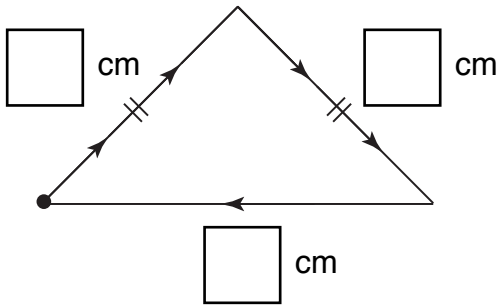
Prime numbers



Work out the lengths of the sides of the **second** possible isosceles triangle.

1 d The **perimeter** of an isosceles triangle is **17 cm**
The **length** of each side, in cm, is a **prime number**.

Write the length of each side on the isosceles triangle.



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11.8 Number Properties Primes Introduction 2

F/H

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1 a Complete the table of prime numbers less than 25.

Prime number	2				11				23

1 b Complete the table.

Prime number	2				11				23
Prime number × 2	4				22				46

1 c The **perimeter** of an isosceles triangle is **45 cm**
The **length** of each side, in cm, is a **prime number**.

Work out the lengths of the sides of the **two** possible isosceles triangles.

First triangle: _____ cm _____ cm _____ cm

Second triangle: _____ cm _____ cm _____ cm

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11.8 Number Properties Primes Introduction: Test

F/H

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1 The **perimeter** of an isosceles triangle is **43 cm.**
The **length** of each side, in cm, is a **prime number**.

Work out the lengths of the sides of the **two** possible isosceles triangles.

First triangle: _____ cm _____ cm _____ cm

Second triangle: _____ cm _____ cm _____ cm

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11.8 Number Properties Primes Introduction 2

1a

Prime number	2	3	5	7	11	13	17	19	23

1b

Prime number	2	3	5	7	11	13	17	19	23
Prime number × 2	4	6	10	14	22	26	34	38	46

1c

First triangle: 13 cm, 13 cm, 19 cm

Second triangle: 17 cm, 17 cm , 11 cm

Prime Numbers : Test

Prime Numbers < 25 :

Prime number	2	3	5	7	11	13	17	19	23
Prime number × 2	4	6	10	14	22	26	34	38	46

First triangle: 19 cm, 19 cm, 5 cm

Second triangle: 13 cm, 13 cm , 17 cm

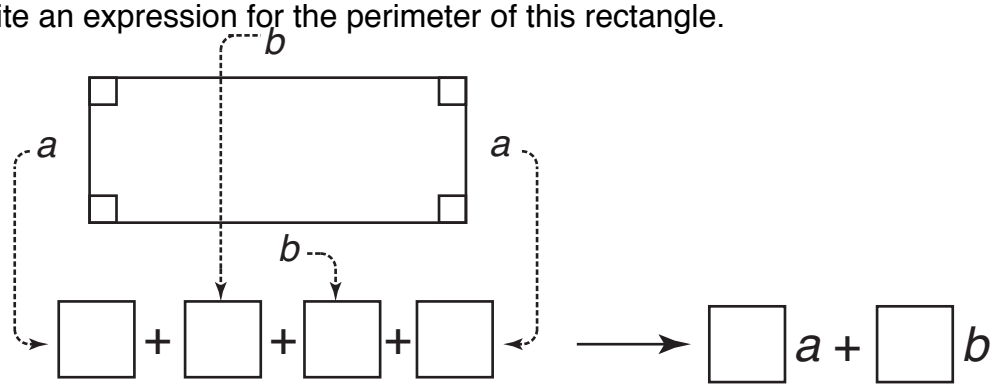
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11.9 Number Properties Primes Advanced 1

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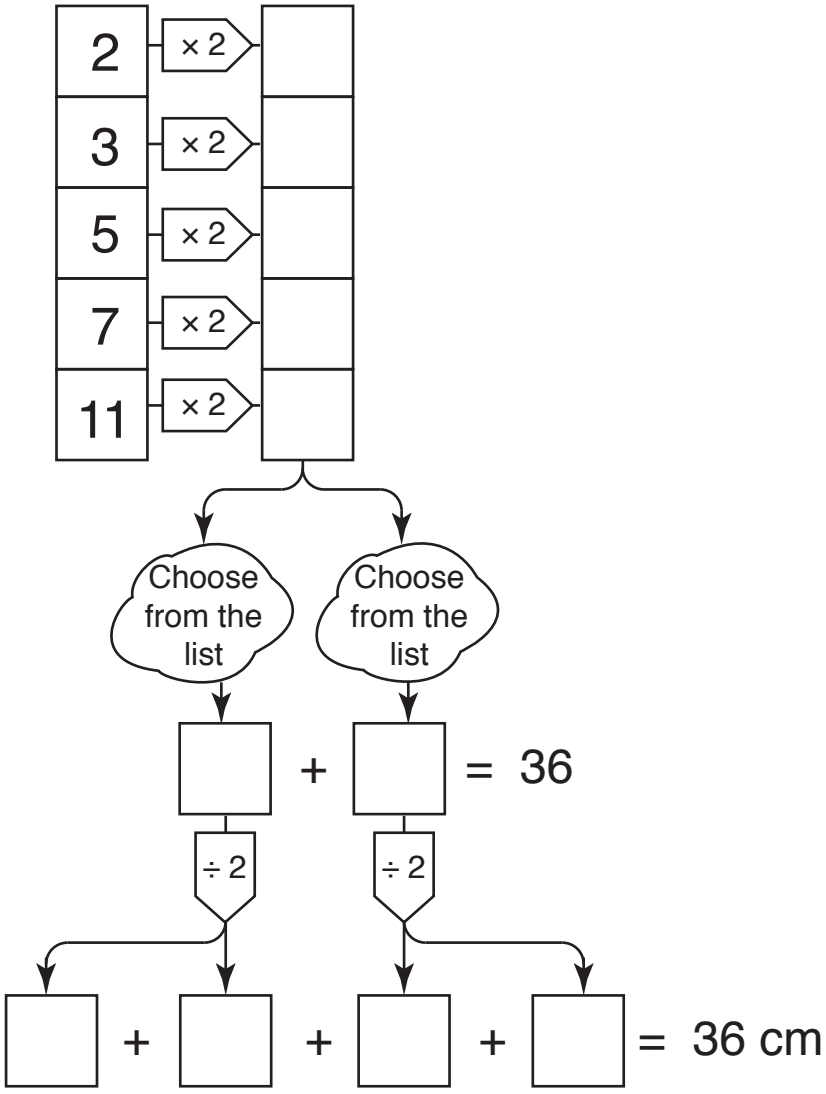
1 a Write an expression for the perimeter of this rectangle.



1 b The perimeter of the rectangle is 36 cm

The length of each side, in cm, is a prime number.

Complete the diagram to find the length of each side of the rectangle.



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11.9 Number Properties Primes Advanced 2

F/H

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1 a Write an expression for the perimeter of this rectangle.

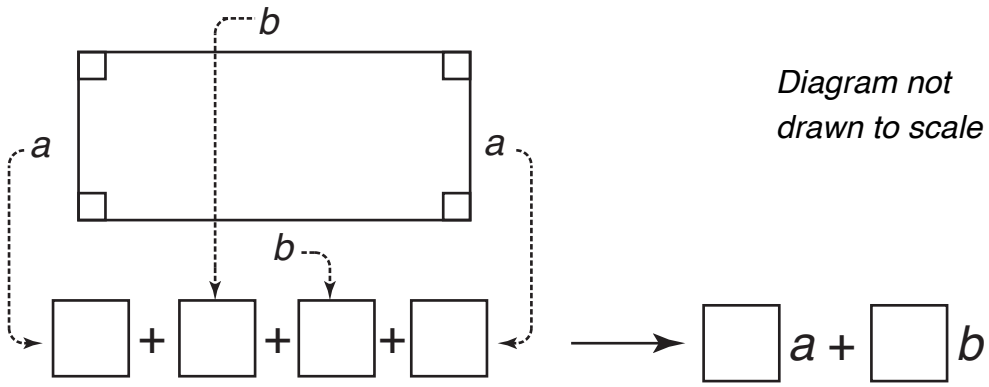
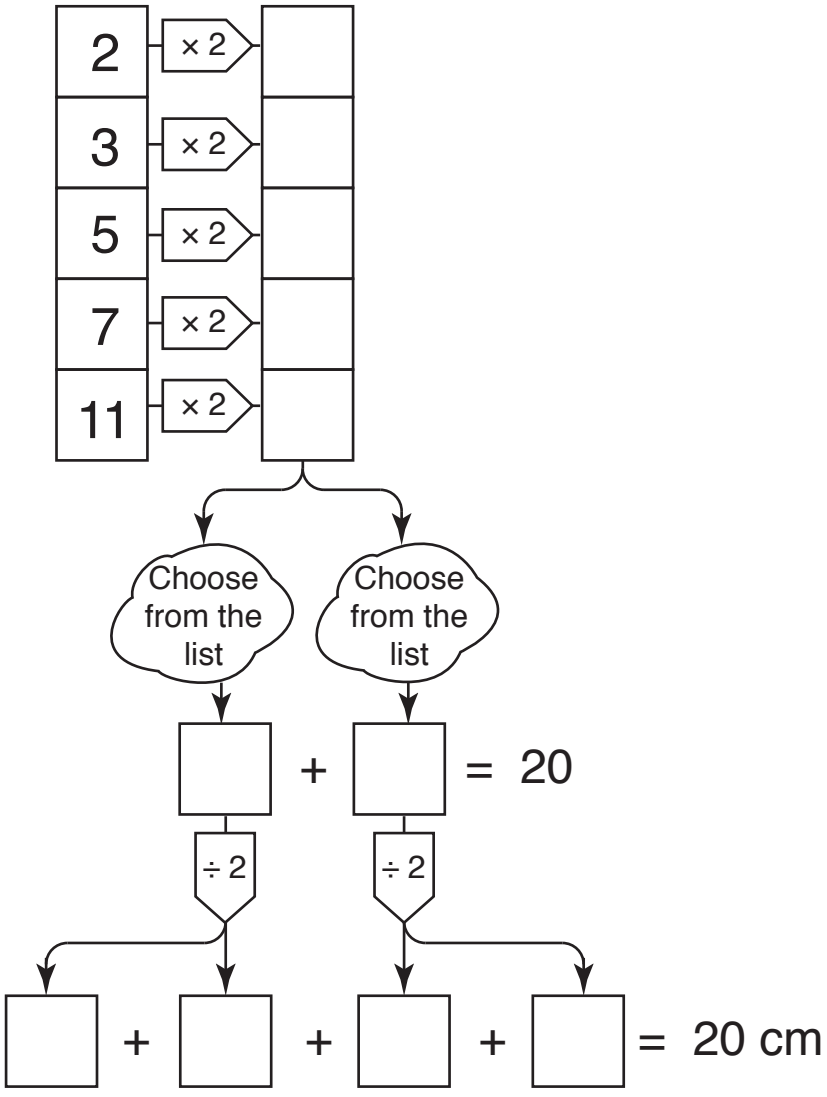


Diagram not drawn to scale

1 b The perimeter of the rectangle is 20 cm

The length of each side, in cm, is a prime number.

Complete the diagram to find the length of each side of the rectangle.



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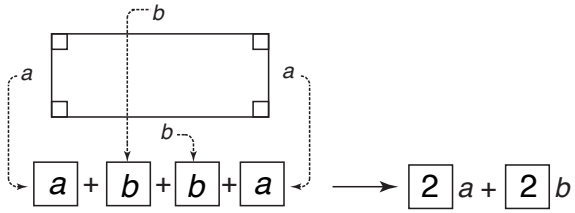
11.9 Number Properties Primes Advanced: Answers

F/H

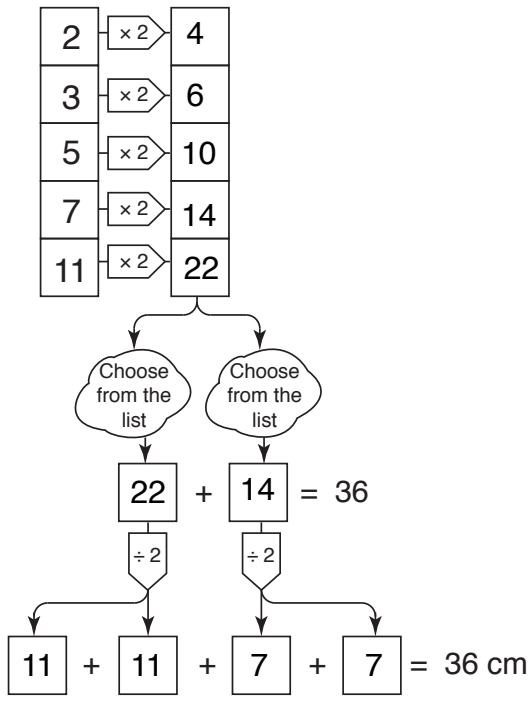
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11.9 Number Properties Primes Advanced 1

1a

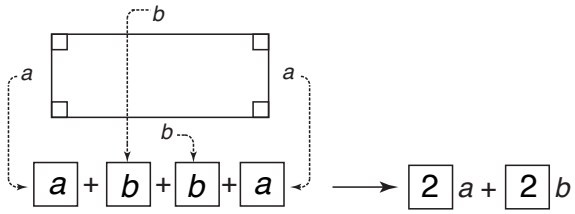


1b

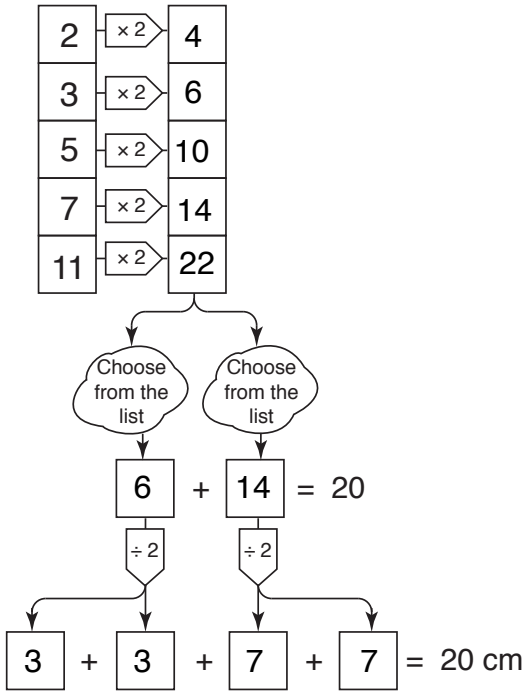


11.9 Number Properties Primes Advanced 2

1a



1b



11.9 Number Properties Primes Advanced : Test

1 Perimeter = $2a + 2b$

Prime Numbers:
2 3 5 7 11...

5 + 5 + 7 + 7 = 24 cm

The lengths are 5 cm, 5 cm, 7 cm, 7 cm

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11.10 Number Properties mixed 1

F/H

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1a Write down the factors of 18

Answer | | | | | | |

1b Complete the list of prime numbers less than 18

Answer | 2 | 3 | | | | | 17 |

1c Write down three different factors of 18 that add together to give a prime number.

Answer | | + | | + | | = | |

Factors of 18

Prime

2a Write down the factors of 20

Answer | | | | | | |

2b Complete the list of square numbers less than 20

Answer | 1 | 4 | | |

2c Write down three different factors of 20 that add together to give a square number.

Answer | | + | | + | | = | |

Factors of 20

Square number

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11.10 Number Properties mixed 2

F/H

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1a Write down the factors of 30

Answer ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐

1b Complete the list of cube numbers less than 30

Answer ☐ 8 ☐

1c Write down three different factors of 30 that add together to give a cube number.

Answer ☐ + ☐ + ☐ = ☐

Factors of 30

Cube number

2a Write down the factors of 28

Answer ☐ ☐ ☐ ☐ ☐ ☐

2b Complete the list of prime numbers less than 28

Answer

2 3 ☐ ☐ ☐ ☐ ☐ ☐ 23

2c Write down three different factors of 28 that add together to give a prime number.

Answer ☐ + ☐ + ☐ = ☐

Factors of 28

Prime number

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11.10 Number Properties mixed: Answers

F/H

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11.10 Number Properties mixed 1

1a factors of 18:
1 2 3 6 9 18

1b prime numbers < 18
2 3 5 7 11 13 17

1c 3 + 2 + 6 = 11
(3, 2, 6: Factors of 18; 11: Prime)

2a factors of 20:
1 2 4 5 10 20

2b square numbers < 20
1 4 9 16

2c 2 + 4 + 10 = 16
(2, 4, 10: Factors of 20; 16: Square number)

11.10 Number Properties mixed 2

1a factors of 30:
1 2 3 5 6 10 15 30

1b cube numbers < 30
1 8 27

1c 2 + 10 + 15 = 27
(2, 10, 15: Factors of 30; 27: Cube number)

2a factors of 28:
1 2 4 7 14 28

2b prime numbers < 28
2 3 5 7 11 13 17 19 23

2c 4 + 14 + 1 = 19
(4, 14, 1: Factors of 28; 19: Prime number)

11.10 Number Properties mixed: Test

1 factors of 36:
1 2 3 4 6 9 12 18 36

prime numbers < 19
2 3 5 7 11 13 17

2 + 12 + 3 = 17
(2, 12, 3: Factors of 36; 17: Prime)

... and other examples

2 factors of 40:
1 2 4 5 8 10 20 40

square numbers:
1 4 9 16 25 36 49 64...

1 + 4 + 20 = 25
(1, 4, 20: Factors of 40; 25: Square number)

... and other examples

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12 Averages

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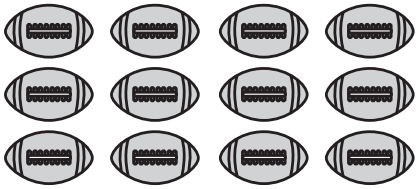
12.1 Working with the mean introduction 1

F/H

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1a At a rugby tournament the mean number of points scored in the first four matches is 3

Calculate the total number of points scored in the four matches.

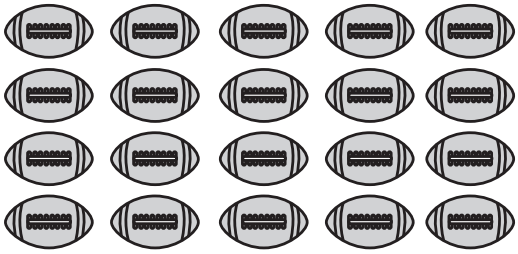


$\square$ × $\square$ = $\square$

Mean Points | Number of matches | Total Points

1b The mean number of points scored in the first five matches is 4

Calculate the total number of points scored in the five matches.



$\square$ × $\square$ = $\square$

Mean Points | Number of matches | Total Points

1c Calculate how many points were scored in the fifth match.

$\square$ − $\square$ = $\square$

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12.1 Working with the mean introduction: Test

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1 At a football tournament the mean number of goals scored in the first four matches is 5

After the fifth match the mean number of goals is now 6

Work out the number of goals scored in the fifth match.

Answer _____

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12.1 Working with the mean introduction 1

1a 3 × 4 = 12 points

1b 5 × 4 = 20 points

1c 20 – 12 = 8 points

12.1 Working with the mean introduction 2

1a 4 × 2 = 8 goals

1b 5 × 3 = 15 goals

1c 15 – 8 = 7 goals

12.1 Working with the mean introduction: Test

1 4 × 5 = 20 goals

5 × 6 = 30 goals

30 – 20 = 10 goals

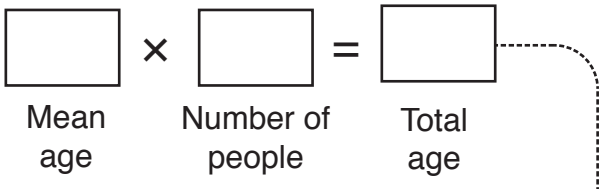
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12.2 Working with the mean next steps 1

F/H

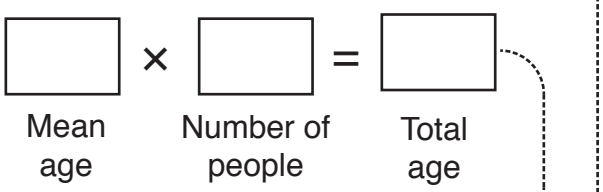
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1a At a fitness club the mean age of **4** people is **30** years old.
Calculate the total age of all 4 people.



1b Kate joins the fitness club.
The mean age of all **5** people is now **32** years old.
Calculate the total age of all 5 people.

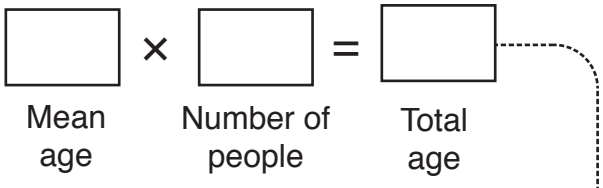




1c Work out the age of Kate.

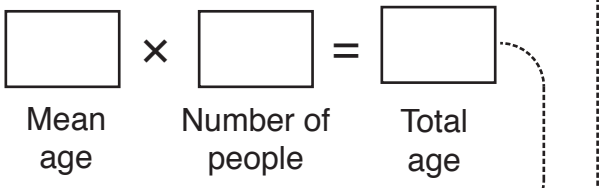


2a At a chess club the mean age of **5** people is **40** years old.
Calculate the total age of all 4 people.

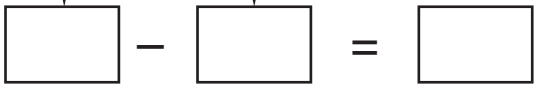


2b Billy joins the chess club.
The mean age of all **6** people is now **42** years old.
Calculate the total age of all 6 people.





2c Work out the age of Billy.



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12.2 Working with the mean next steps: Test

F/H

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1 At a running club the mean age of
5 people is **35** years old.
Sean joins the running club.
The mean age of all **6** people is now **37** years old.
Work out the age of Sean.



Answer _____

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12.2 Working with the mean next steps 1

1a 4 × 30 = 120 years

1b 5 × 32 = 160 years

1c 160 – 120 = 40 years old

2a 5 × 40 = 200 years

2b 6 × 42 = 252 years

2c 252 – 200 = 52 years old

12.2 Working with the mean next steps 2

1a 10 × 25 = 250 years

1b 11 × 24 = 264 years

1c 264 – 250 = 14 years old

2a 5 × 30 = 150 years

2b 6 × 31 = 186 years

2c 186 – 150 = 36 years old

12.2 Working with the mean next steps: Test

1 5 × 35 = 175 years

6 × 37 = 222 years

222 – 175 = 47 years old

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12.3 Working with the mean advanced 1

F/H

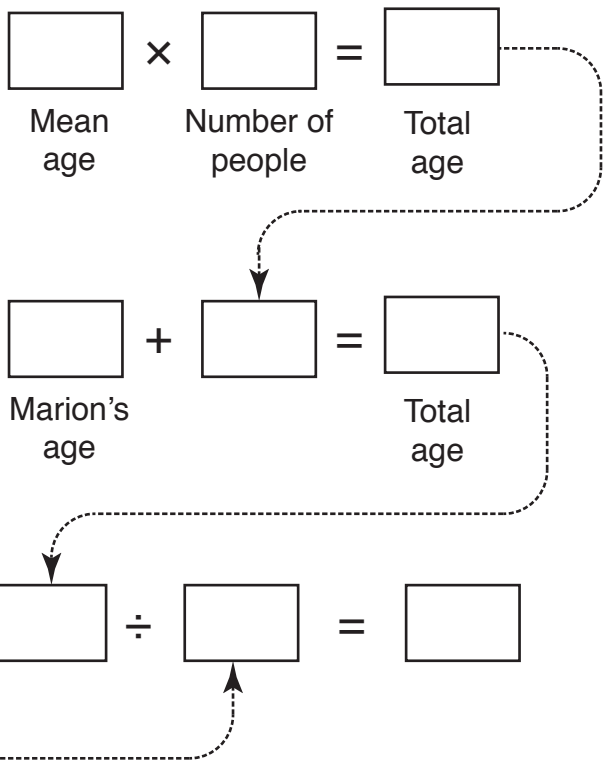
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1a At a tennis club the mean age of **4** people is **20** years old.
Work out the total age of all 4 people.



1b Marion joins the tennis club.
Marion is **25** years old.
Work out the total age of all 5 people.

1c Work out the mean age of all **5** people.

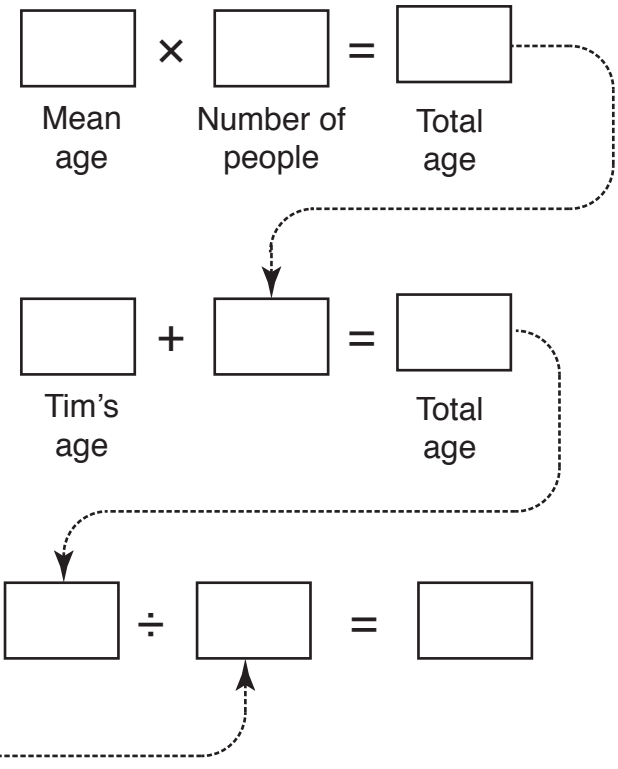


2a At a climbing club the mean age of **5** people is **20** years old.
Work out the total age of all 5 people.



2b Tim joins the climbing club.
Tim is **32** years old.
Work out the total age of all 6 people.

2c Work out the mean age of all **6** people.



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12.3 Working with the mean advanced: Test

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1 At a dance club the mean age of
5 people is **40** years old.
Mandy joins the dance club.
Mandy is **28** years old.
Work out the mean age of all 6 people.

Answer _____

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12.3 Working with the mean advanced 1

1a 4 × 20 = 80 years

1b 80 + 25 = 105 years

1c 105 ÷ 5 = 21 years old

2a 5 × 20 = 100 years

2b 100 + 32 = 132 years

2c 132 ÷ 6 = 22 years old

12.3 Working with the mean advanced 2

1a 6 × 25 = 150 years

1b 150 + 39 = 189 years

1c 189 ÷ 7 = 27 years old

2a 4 × 30 = 120 years

2b 120 + 40 = 160 years

2c 160 ÷ 5 = 32 years old

12.3 Working with the mean advanced: Test

1 5 × 40 = 200 years

200 + 28 = 228 years

228 ÷ 6 = 38 years old

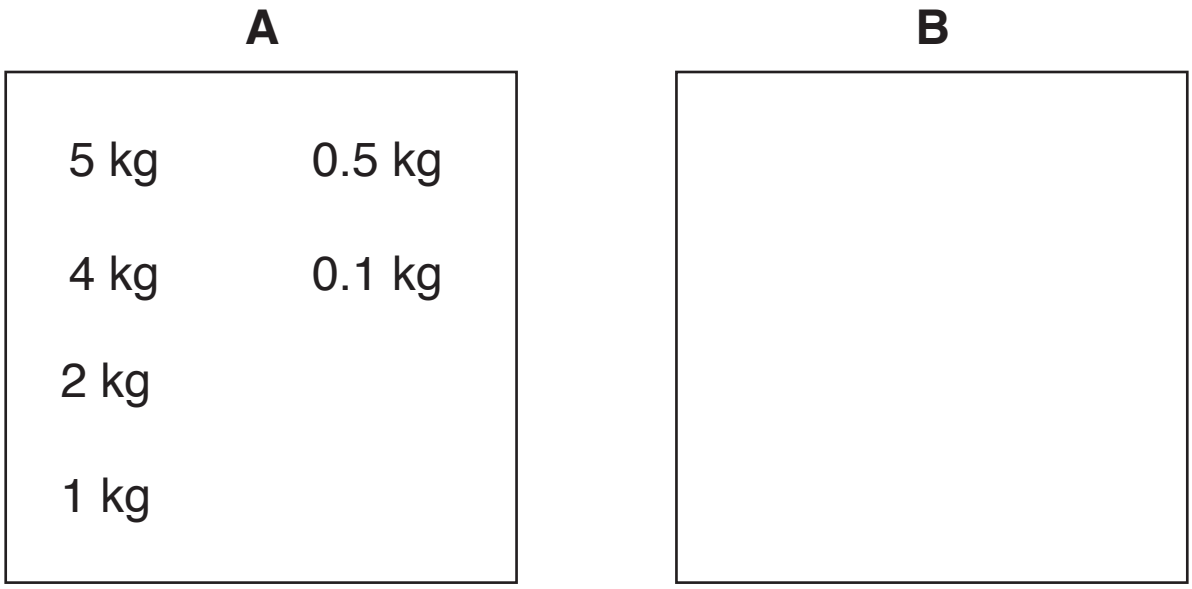
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12.4 Working with the mean extension 1

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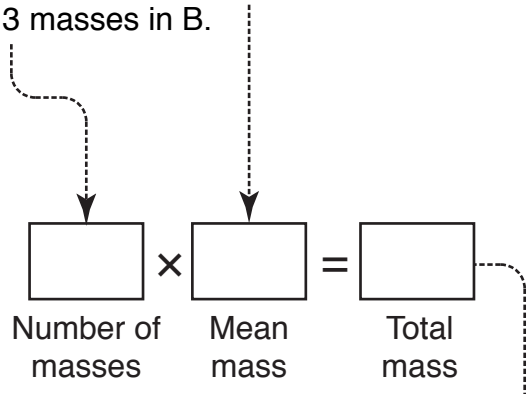
1 In square A there are six masses.



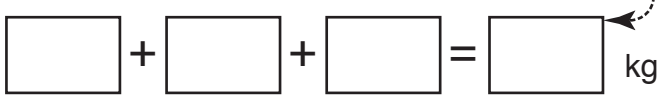
1a Three of the masses are moved from A to B.

The mean of the three masses in B is now 2.5 kg.

Calculate the total mass of the 3 masses in B.



1b Which three masses move?



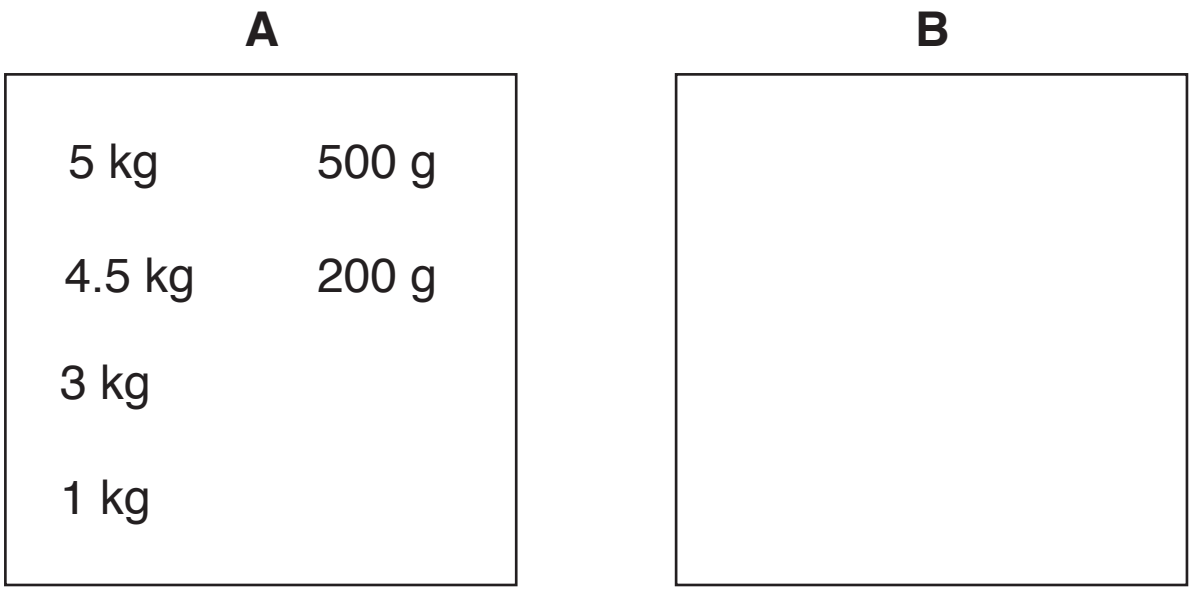
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12.4 Working with the mean extension: Test

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1 In square A there are six masses.



Three of the masses are moved from A to B.

The mean of the three masses in B is now 1.5 kg.

Which **three** masses move?

You **must** show your working.

Answer _____

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12.4 Working with the mean extension 1

1a 2.5 × 3 = 7.5 kg

1b 5 kg + 2 kg + 0.5 kg = 7.5 kg

12.4 Working with the mean extension 2

1a 1.2 × 3 = 3.6 kg

1b 3 kg + 500 g + 100 g = 3.6 kg

12.4 Working with the mean extension: Test

1 1.5 × 3 = 4.5 kg

3 kg + 1k g + 500 g = 4.5 kg

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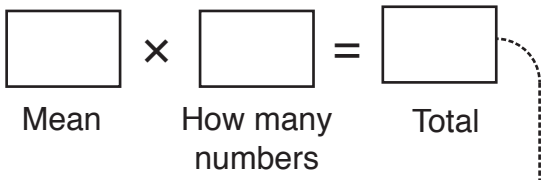
12.5 Working with all averages 1

F/H

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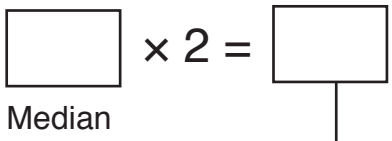
1a Four numbers have a mean of 6

Calculate the sum of the four numbers.



1b The median is 7

Calculate the sum of the two middle numbers.





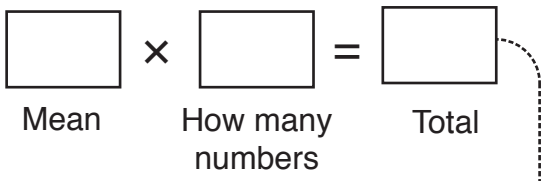
1c The mode is 8

What are the four numbers?



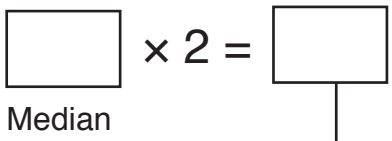
2a Four numbers have a mean of 5

Calculate the sum of the four numbers.



2b The median is 5.5

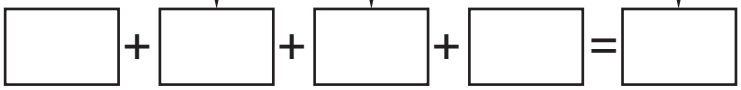
Calculate the sum of the two middle numbers.





2c The mode is 6

What are the four numbers?



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12.5 Working with all averages: Test

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1 The mean of four numbers is 7

The median is 5

The mode is 4

What are the four numbers?

Answer _____

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12.5 Working with all averages: Answers

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12.5 Working with all averages 1

1a 6 × 4 = 24

1b 7 × 2 = 14

1c 2 6 8 8

2a 5 × 4 = 20

2b 5.5 × 2 = 11

2c 3 5 6 6

12.5 Working with all averages 2

1a 4 × 8 = 32

1b 9 × 2 = 18

1c 4 8 10 10

2a 4 × 9 = 36

2b 10 × 2 = 20

2c 4 8 12 12

12.5 Working with all averages Test

1 Total of numbers is 4 × 7 = 28

Sum of middle numbers is 5 × 2 = 10

4 4 6 14

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13 Angles

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13.1	Angles	496
13.2	Angles	500
13.3	Angles	504
13.4	Angles	508
13.5	Angles	512
13.6	Angles	516
13.7	Angles	520
13.8	Angles	524
13.9	Angles	528
13.10	Angles	532
13.11	Angles	536
13.12	Angles	540
13.13	Angles	544
13.14	Angles	548
13.15	Angles	552
13.16	Angles	556
13.17	Angles	560
13.18	Angles	564

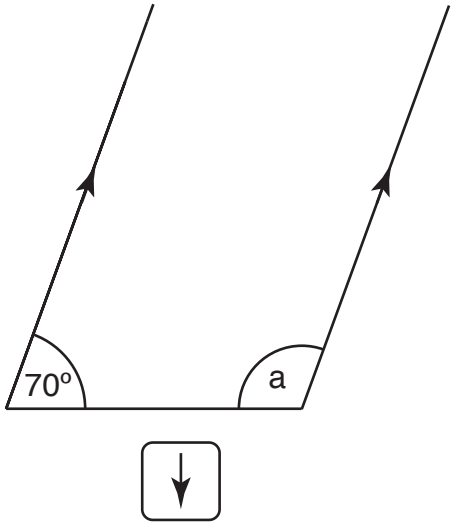
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13.1 Angles 2

F/H

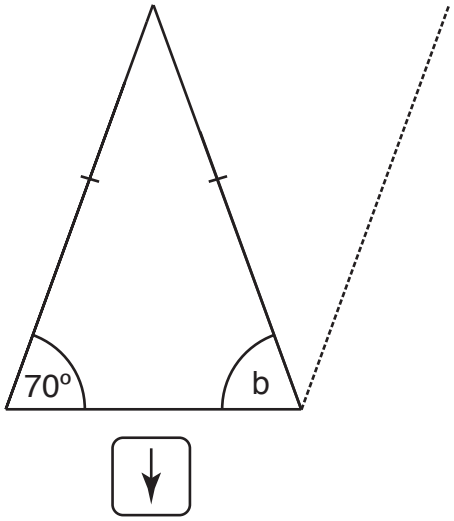
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1 a Co-interior angles add up to 180°.
Calculate angle a.



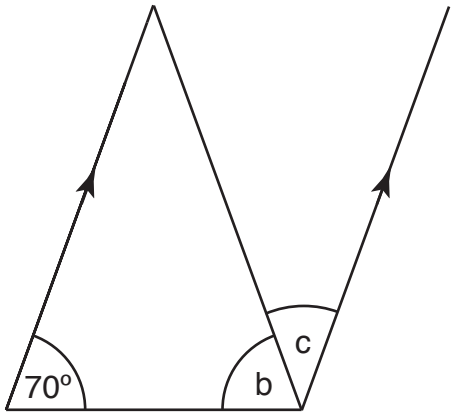
Answer _____ °

1 b The diagram shows an isosceles triangle.
Write down angle b.



Answer _____ °

1 c Work out angle c.



Answer _____ °

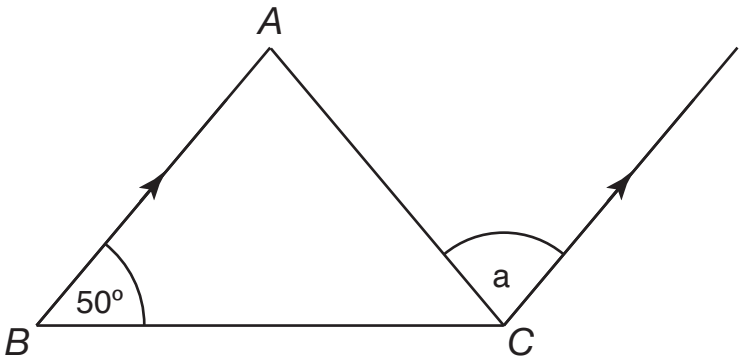
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13.1 Angles: Test

F/H

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1 In the diagram $AB = AC$



Show that angle a = 80°.

Answer _____

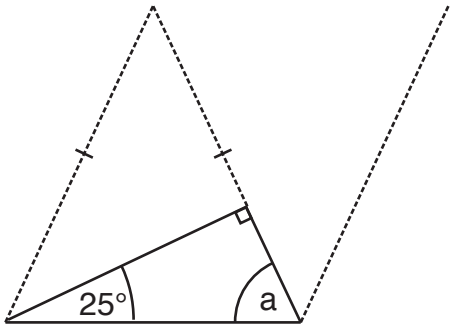
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13.2 Angles 1

F/H

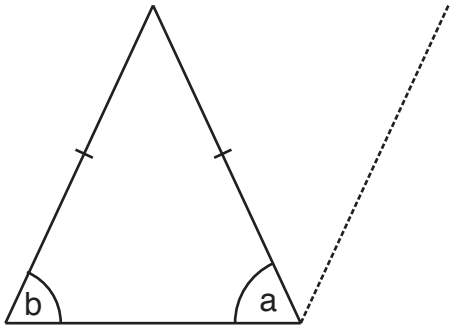
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1 a The sum of the angles in a triangle equals 180°
Calculate angle a.



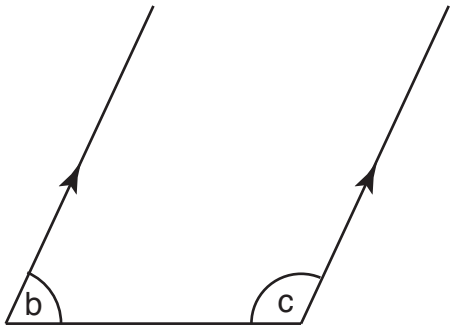
Answer _____ °

1 b The diagram shows an isosceles triangle.
Write down angle b.



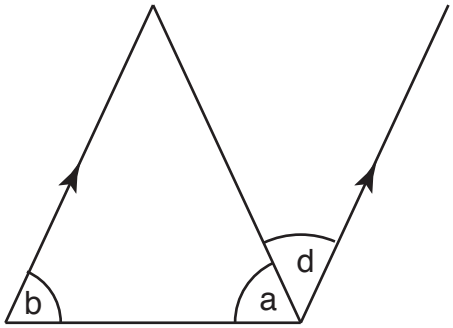
Answer _____ °

1 c Co-interior angles add up to 180°
Calculate angle c.



Answer _____ °

1 d Work out angle d.



Answer _____ °

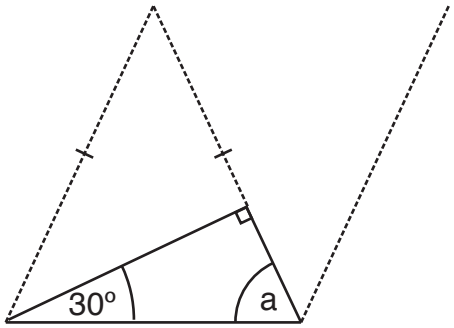
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13.2 Angles 2

F/H

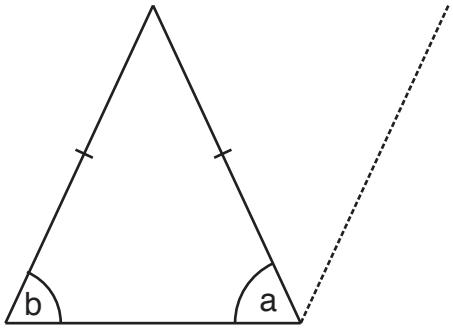
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1 a The sum of the angles in a triangle equals 180°
Calculate angle a.



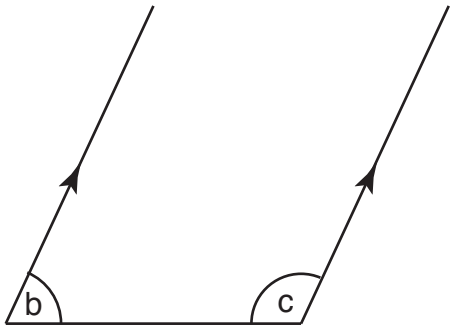
Answer _____ °

1 b The diagram shows an isosceles triangle.
Write down angle b.



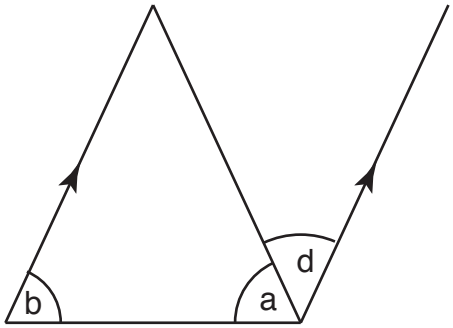
Answer _____ °

1 c Co-interior angles add up to 180°
Calculate angle c.



Answer _____ °

1 d Work out angle d.



Answer _____ °

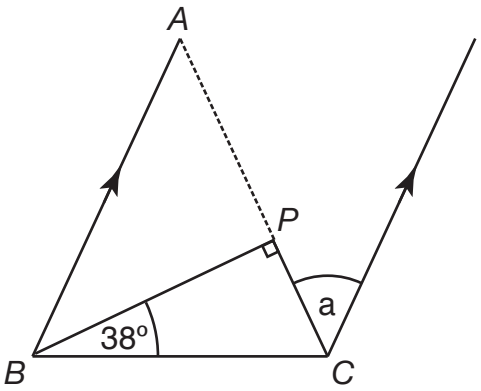
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13.2 Angles: Test

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1 In the diagram $AB = AC$



Show that angle a = 76 °.

Answer _____

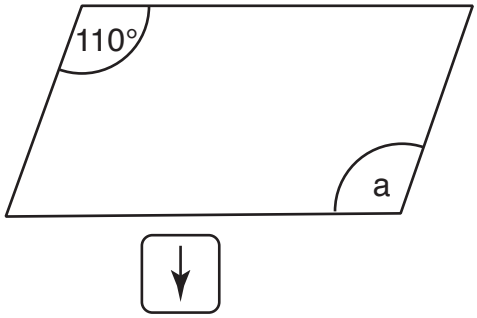
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13.3 Angles 1

F/H

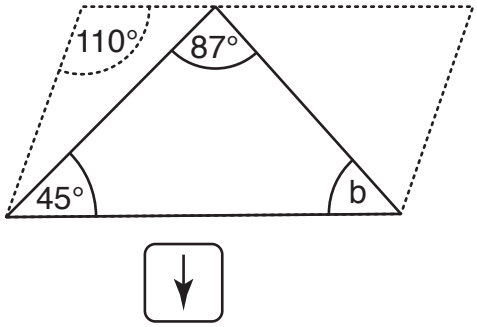
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1 a The diagram shows a parallelogram.
Calculate angle a.



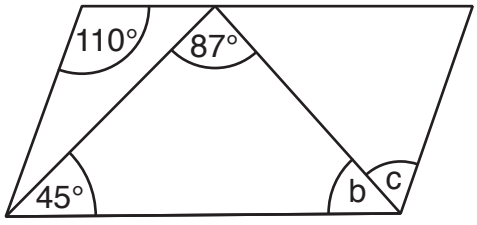
Answer _____ °

1 b The sum of the angles in a triangle equals 180°
Calculate angle b.



Answer _____ °

1 c Calculate angle c.



Answer _____ °

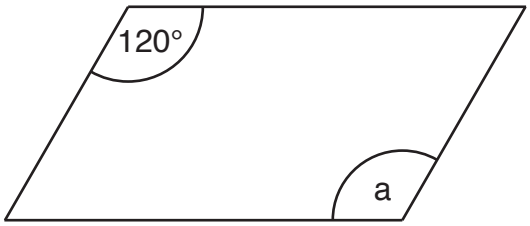
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13.3 Angles 2

F/H

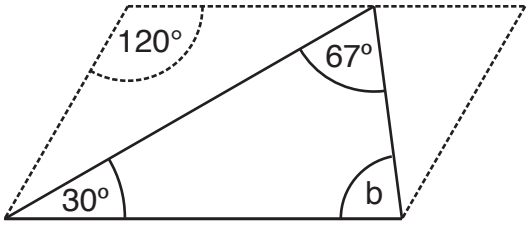
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1 a The diagram shows a parallelogram.
Calculate angle a.



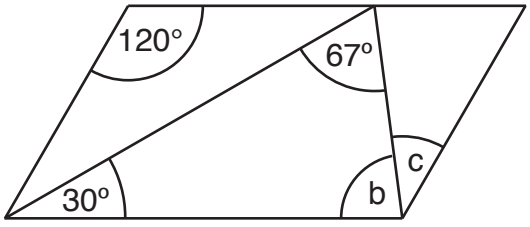
Answer _____ °

1 b The sum of the angles in a triangle equals 180°
Calculate angle b.



Answer _____ °

1 c Calculate angle c.



Answer _____ °

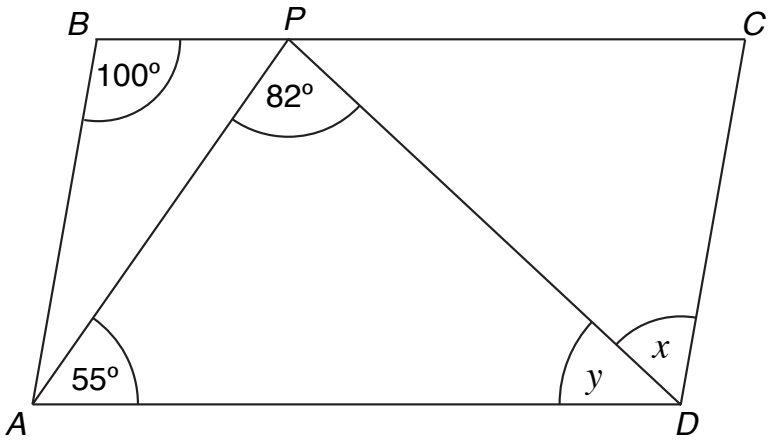
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13.3 Angles: Test

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1 The diagram shows a parallelogram *ABCD.*



P is a point on *BC*

Work out the size of angle y.
Work out the size of angle x.

Answer _____

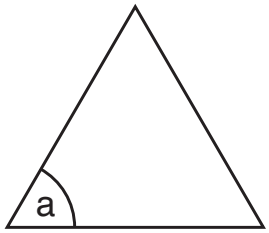
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13.4 Angles 1

F/H

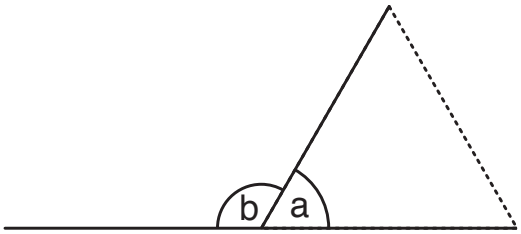
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1 a The diagram shows an equilateral triangle.
Write down the value of angle a.



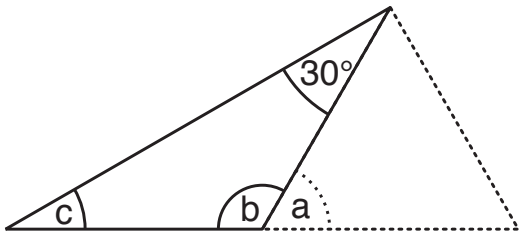
Answer _____ °

1 b The sum of the angles on a straight line equals 180°
Calculate angle b.



Answer _____ °

1 c The sum of the angles in a triangle equals 180°
Calculate angle c.



Answer _____ °

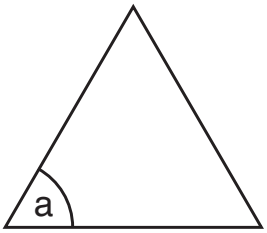
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13.4 Angles 2

F/H

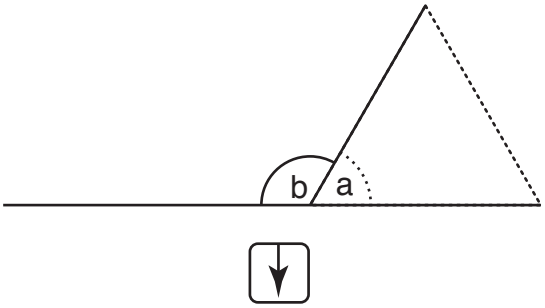
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1 a The diagram shows an equilateral triangle.
Write down the value of angle a.



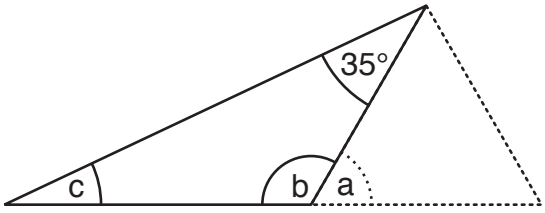
Answer _____ °

1 b The sum of the angles on a straight line equals 180°
Calculate angle b.



Answer _____ °

1 c The sum of the angles in a triangle equals 180°
Calculate angle c.



Answer _____ °

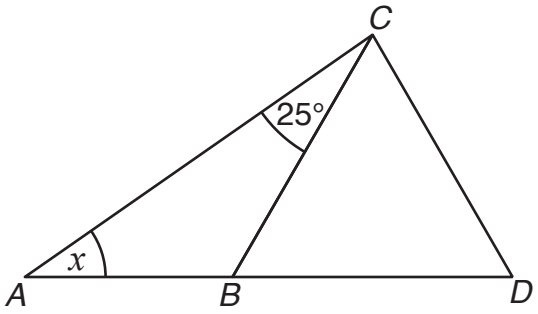
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13.4 Angles: Test

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1 The diagram shows a triangle *ABC* and an equilateral triangle *BCD.*



Work out the size of angle x.

Answer _____

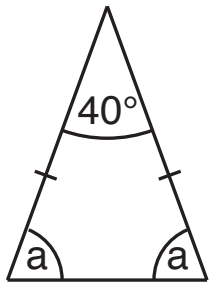
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13.5 Angles 1

F/H

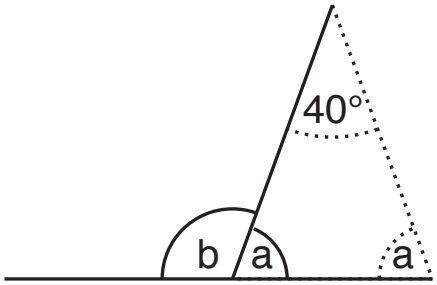
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1 a The diagram shows an isosceles triangle.
Calculate the value of angle a.



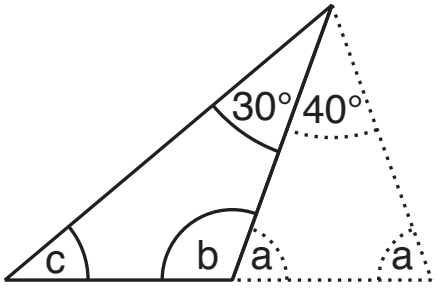
Answer _____ °

1 b The sum of the angles on a straight line equals 180°
Calculate angle b.



Answer _____ °

1 c The sum of the angles in a triangle equals 180°
Calculate angle c.



Answer _____ °

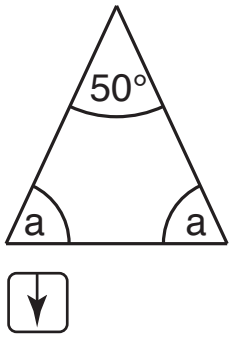
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13.5 Angles 2

F/H

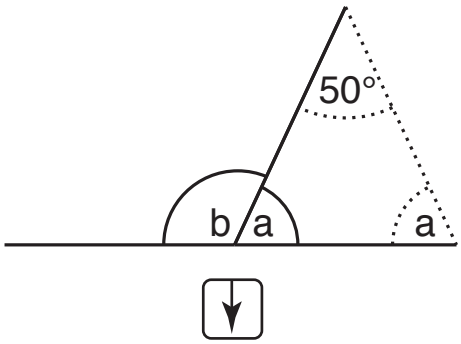
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1 a The diagram shows an isosceles triangle.
Calculate the value of angle a.



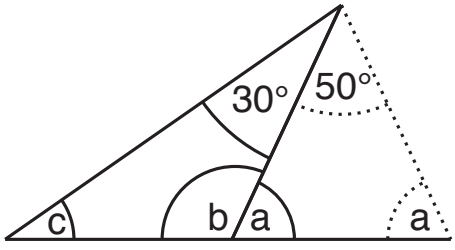
Answer _____ °

1 b The sum of the angles on a straight line equals 180°
Calculate angle b.



Answer _____ °

1 c The sum of the angles in a triangle equals 180°
Calculate angle c.



Answer _____ °

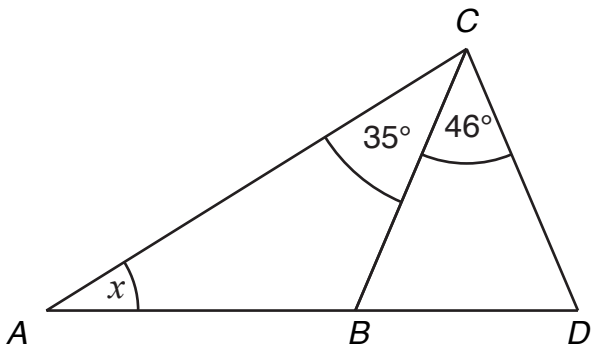
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13.5 Angles: Test

F/H

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1 The diagram shows a triangle *ACD* and an isosceles triangle *BCD.*
Length *CB* = *CD*.



Work out the size of angle x.

Answer _____

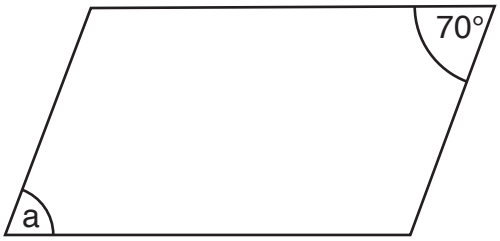
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13.6 Angles 1

F/H

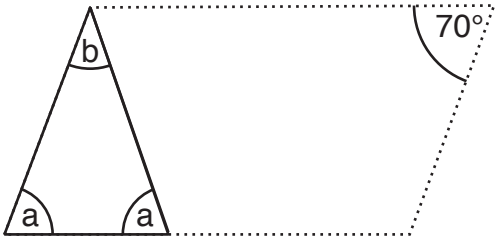
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1 a The diagram shows a parallelogram.
Write down the value of angle a.



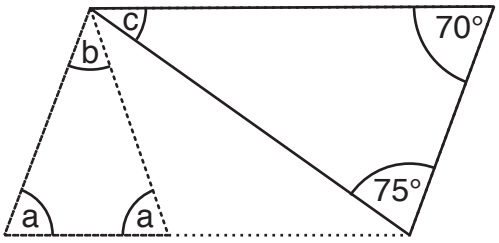
Answer _____ °

1 b The diagram shows an isosceles triangle.
Calculate the value of angle b.



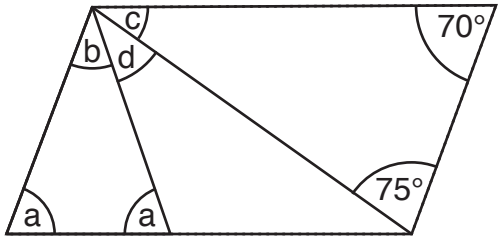
Answer _____ °

1 c The diagram shows a triangle.
Calculate the value of angle c.

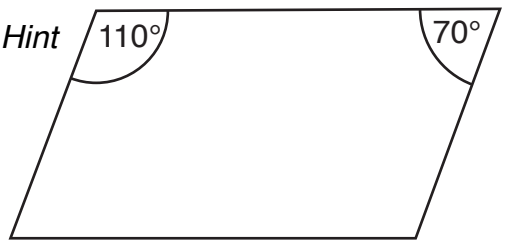


Answer _____ °

1 d Calculate the value of angle d.



Hint



Answer _____ °

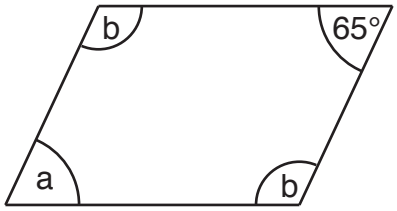
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13.6 Angles 2

F/H

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1 a The diagram shows a parallelogram.
Write down the value of angle a.

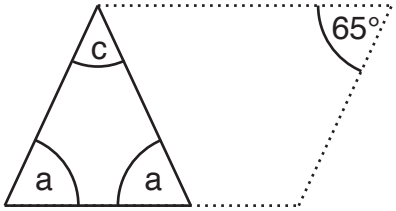


Answer a = _____ °

1 b Work out the value of angle b.

_____ Answer b = _____ °

1 c The diagram shows an isosceles triangle.
Calculate the value of angle c.



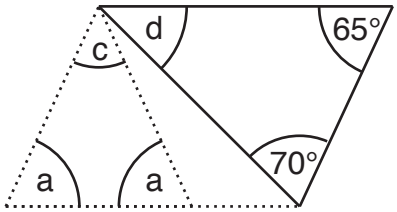
_____

_____

_____

Answer _____ °

1 d The diagram shows a triangle.
Calculate the value of angle d.



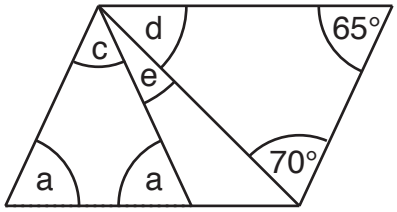
_____

_____

_____

Answer _____ °

1 e Calculate the value of angle e.



_____

_____

_____

Answer _____ °

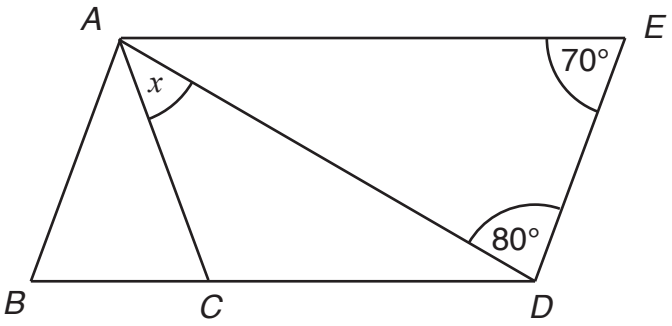
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13.6 Angles: Test

F/H

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1 *ABDE* is a parallelogram.
AB = *AC*



Not drawn accurately

Show that $x = 40°$

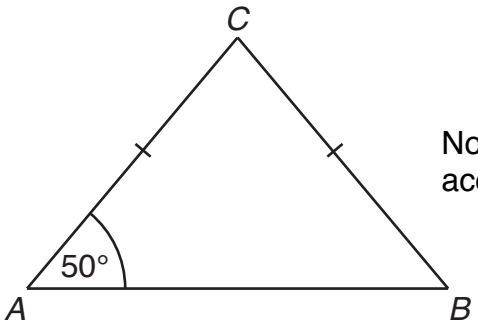
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13.7 Angles 1

F/H

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1 a Triangle *ABC* is isosceles.
CA = *CB*



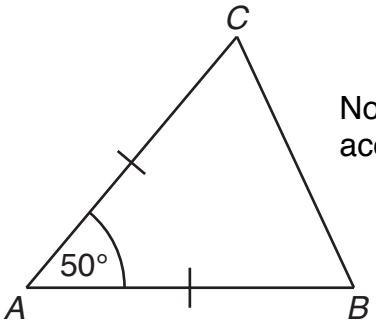
Not drawn accurately

Write down the value of angle *B*.

Answer _____ °

1 b Triangle *ABC* is isosceles.
AC = *AB*

Work out the value of angle *B*.

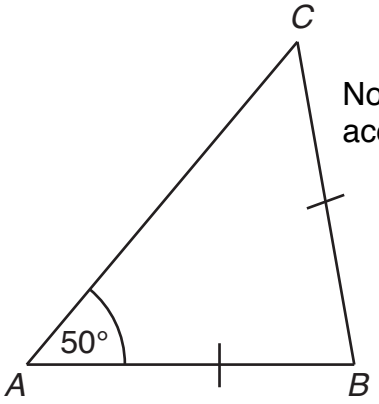


Not drawn accurately

Answer _____ °

1 c Triangle *ABC* is isosceles.
BA = *BC*

Work out the value of angle *B*.



Not drawn accurately

Answer _____ °

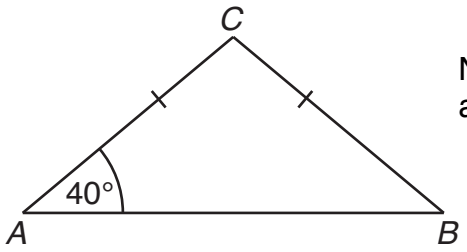
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13.7 Angles 2

F/H

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1 a Triangle *ABC* is isosceles.
CA = *CB*



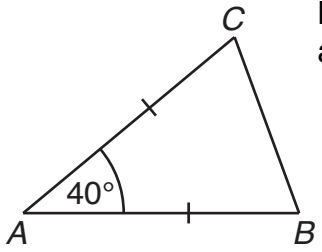
Not drawn accurately

Write down the value of angle *B*.

Answer _____ °

1 b Triangle *ABC* is isosceles.
AC = *AB*

Work out the value of angle *B*.

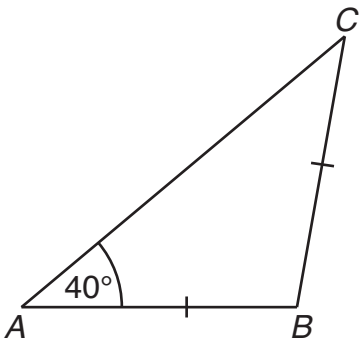


Not drawn accurately

Answer _____ °

1 c Triangle *ABC* is isosceles.
BA = *BC*

Work out the value of angle *B*.



Not drawn accurately

Answer _____ °

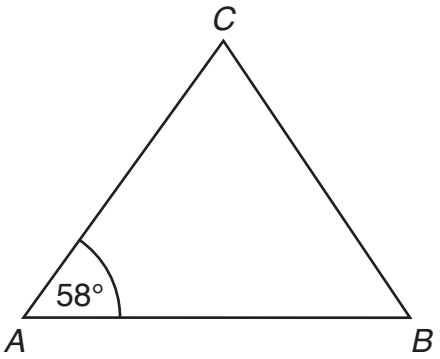
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13.7 Angles: Test

F/H

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1 Triangle *ABC* is isosceles.



Not drawn accurately

Work out three possible values of angle B.

Answers $B =$ _____ ° or $B =$ _____ ° or $B =$ _____ °

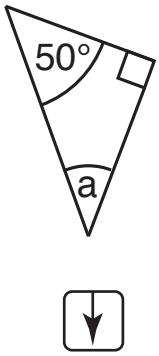
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13.8 Angles 1

F/H

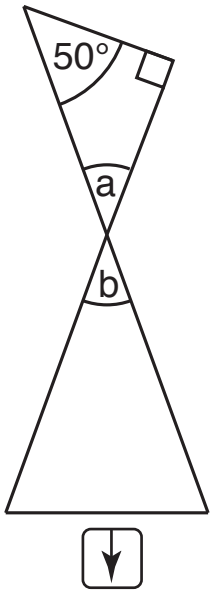
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1 a The diagram shows a triangle.
Calculate the value of angle a.



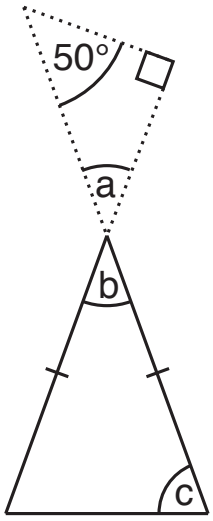
Answer _____ °

1 b Vertically opposite angles are equal.
Write down the value of angle b.



Answer _____ °

1 a The diagram shows an isosceles triangle.
Calculate the value of angle c.



Answer _____ °

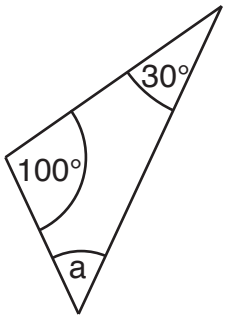
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13.8 Angles 2

F/H

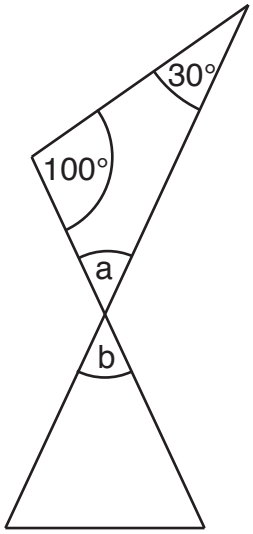
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1 a The diagram shows a triangle.
Calculate the value of angle a.



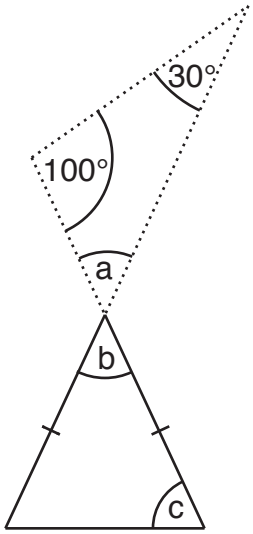
Answer _____ °

1 b Vertically opposite angles are equal.
Write down the value of angle b.



Answer _____ °

1 a The diagram shows an isosceles triangle.
Calculate the value of angle c.



Answer _____ °

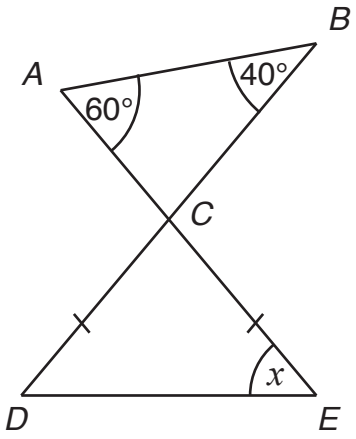
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13.8 Angles: Test

F/H

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1 *ACE* and *BCD* are straight lines.
CD = *CE*



Not drawn accurately

Work out the size of angle x.

Answer _____

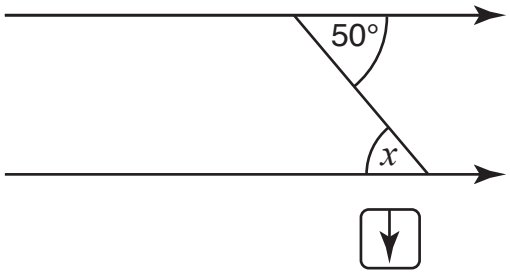
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13.9 Angles 1

F/H

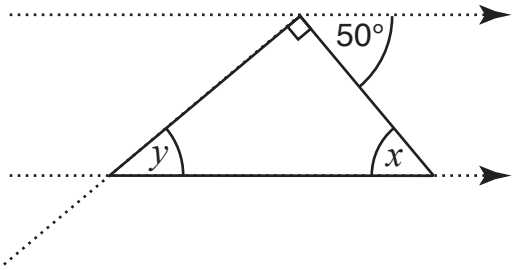
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1 a Alternate angles are equal.
Write down the value of angle x.



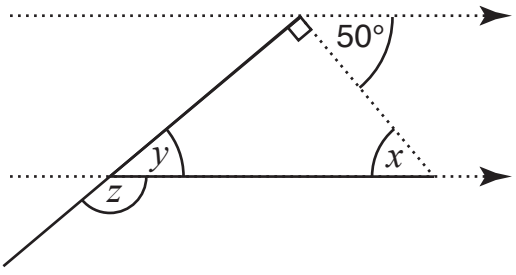
Answer _____ °

1 b Calculate the value of angle y.



Answer _____ °

1 c Calculate the value of angle z.



Answer _____ °

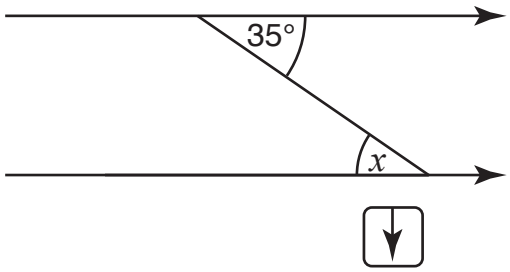
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13.9 Angles 2

F/H

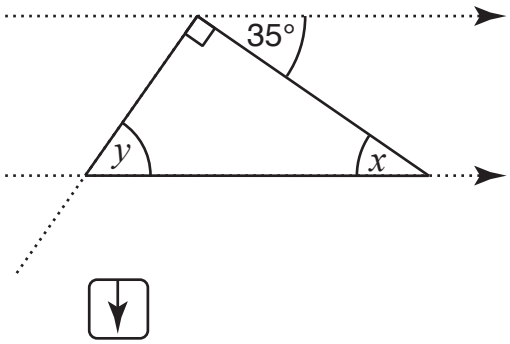
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1 a Alternate angles are equal.
Write down the value of angle x.



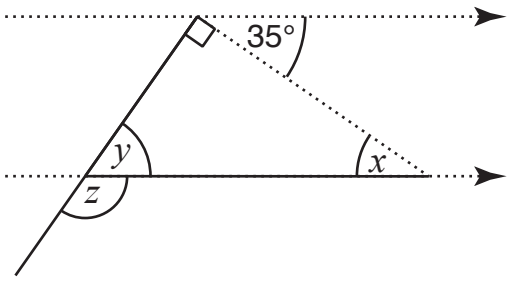
Answer _____ °

1 b Calculate the value of angle y.



Answer _____ °

1 c Calculate the value of angle z.



Answer _____ °

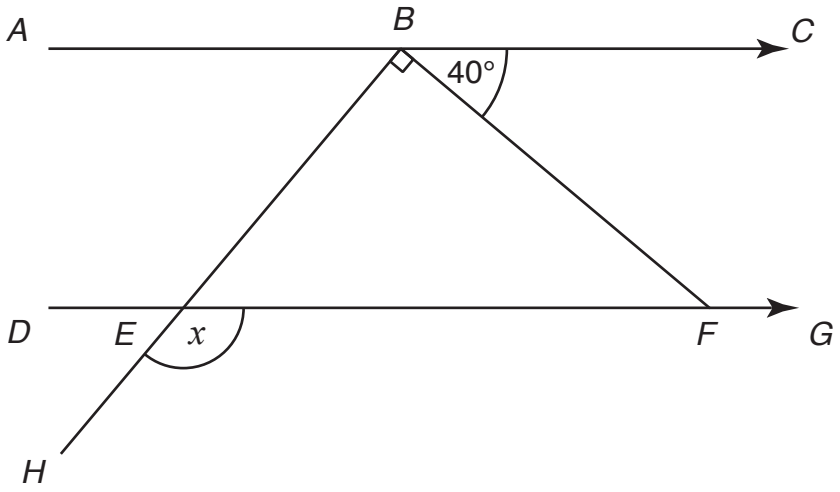
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13.9 Angles: Test

F/H

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1 *ABC* and *DEFG* are parallel lines.
BEH is a straight line.



Not drawn accurately

Work out the size of angle x.

Answer _____

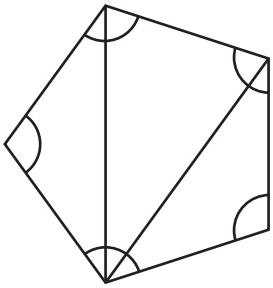
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13.10 Angles 1

F/H

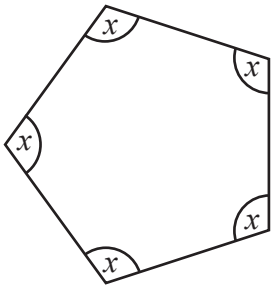
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1 a The diagram shows a regular pentagon.
Calculate the sum of the angles in a pentagon.



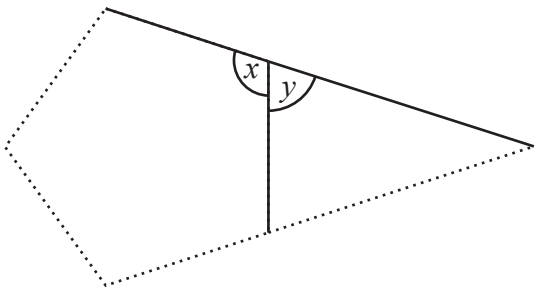
$\square \times 180° = \square$ °

1 b Calculate the value of angle x.



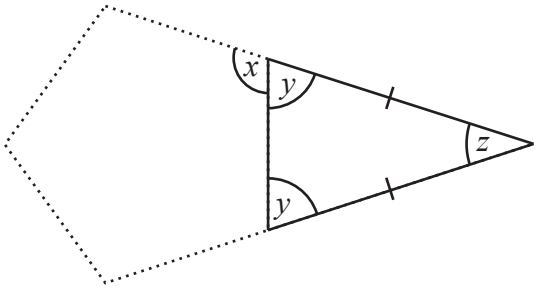
$\square \div 5 = \square$ °

1 c Calculate the value of angle y.



Answer _____ °

1 d The diagram shows an isosceles triangle.
Calculate the value of angle z.



Answer _____ °

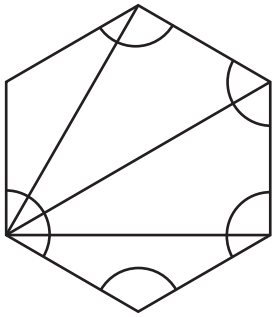
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13.10 Angles 2

F/H

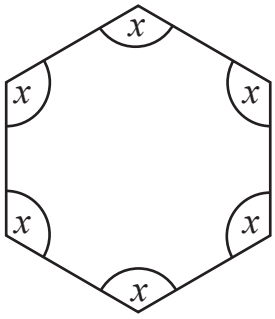
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1 a The diagram shows a regular hexagon.
Calculate the sum of the angles in a hexagon.



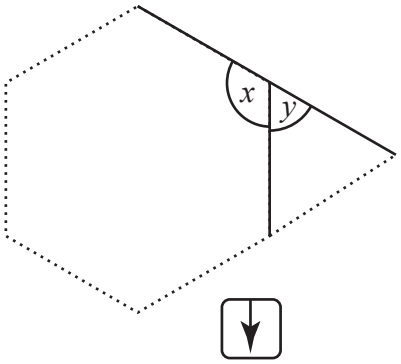
$\square \times 180° = \square$ °

1 b Calculate the value of angle x.



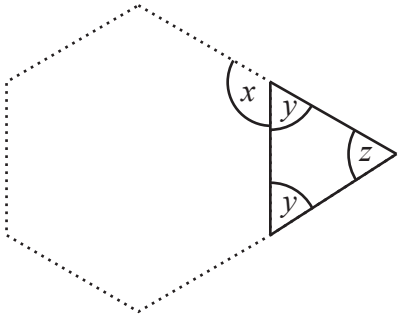
$\square \div 6 = \square$ °

1 c Calculate the value of angle y.



Answer _____ °

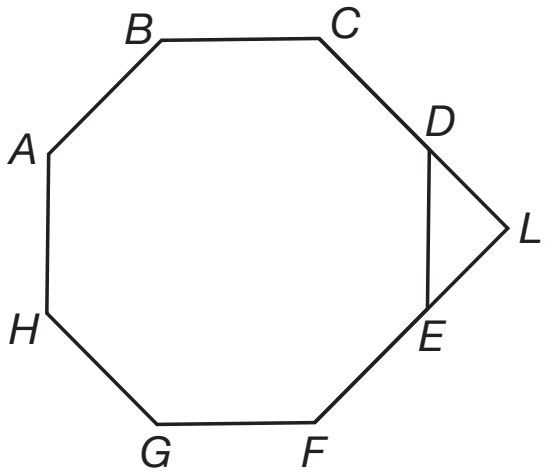
1 d The diagram shows a triangle.
Calculate the value of angle z.



Answer _____ °

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1 *ABCDEFGH* is a regular octagon
FEL and *CDL* are straight lines.



Work out the size of angle *DLE*

Answer _____

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13.11 Angles 1

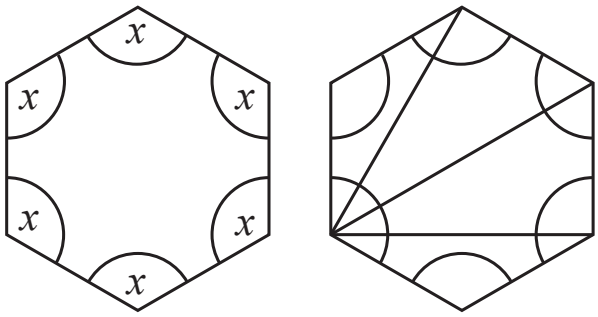
F/H

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1 a The diagram shows a regular hexagon.
Calculate the the value of angle x.

$\square \times 180° = \square$ °

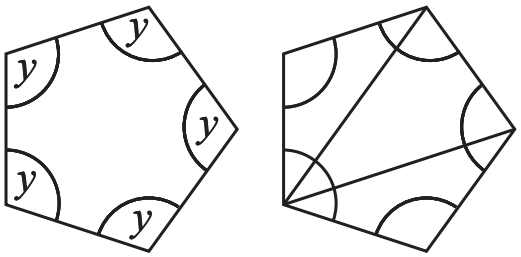
$\square \div 6 = \square$ °



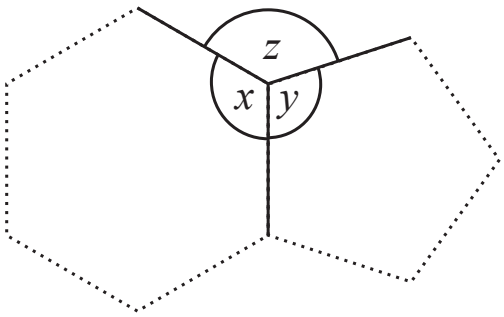
1 b The diagram shows a regular pentagon.
Calculate the the value of angle y.

$\square \times 180° = \square$ °

$\square \div 5 = \square$ °



1 c The sum of the angles at a point equals 360°.
Calculate the value of angle z.



Answer _____ °

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13.11 Angles 2

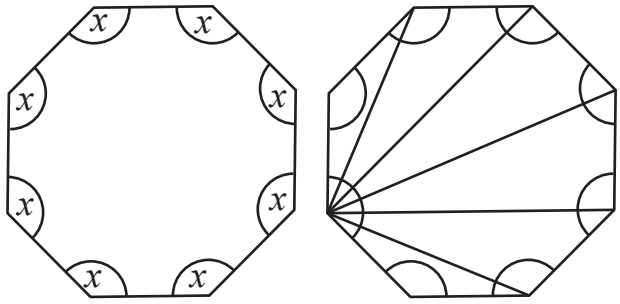
F/H

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1 a The diagram shows a regular octagon.
Calculate the the value of angle x.

$\square \times 180° = \square$ °

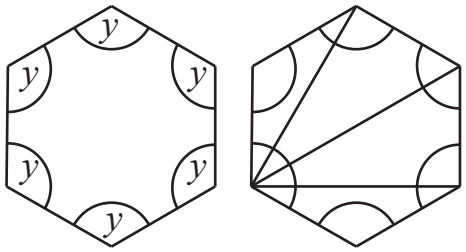
$\square \div 8 = \square$ °



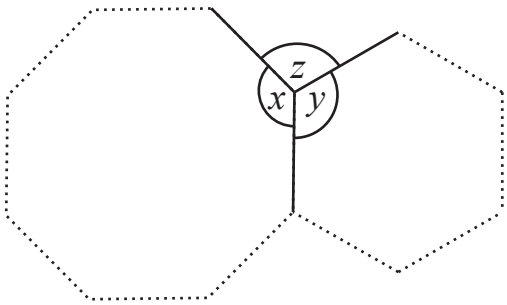
1 b The diagram shows a regular hexagon.
Calculate the the value of angle y.

$\square \times 180° = \square$ °

$\square \div \square = \square$ °



1 c Calculate the value of angle z.



Answer _____ °

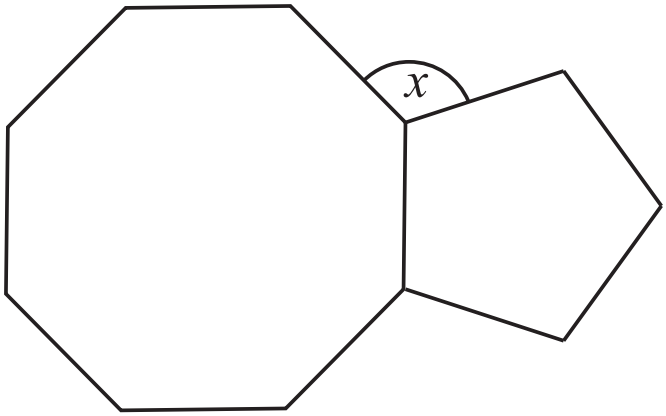
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13.11 Angles: Test

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1 The diagram shows a regular octagon and a regular pentagon.



Find the size of the angle marked x

You must show all of our working.

Answer _____

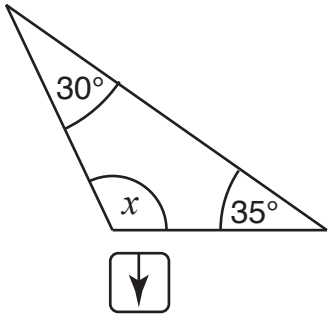
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13.12 Angles 1

F/H

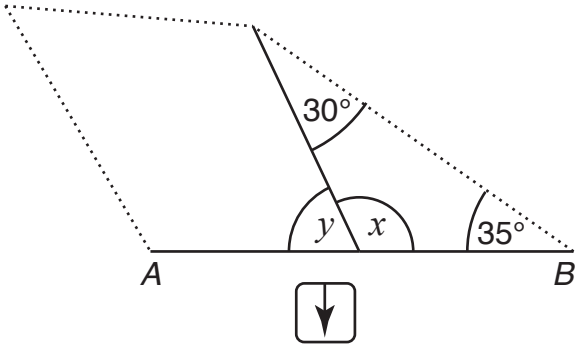
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1 a The diagram shows a triangle.
Calculate the value of angle x.



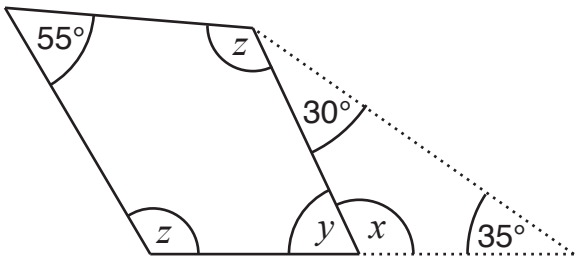
Answer _____ °

1 b AB is a straight line.
Calculate the value of angle y.



Answer _____ °

1 c The diagram shows a quadrilateral.
Calculate the value of angle z.



Answer _____ °

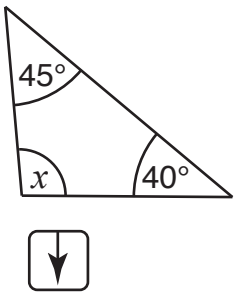
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13.12 Angles 2

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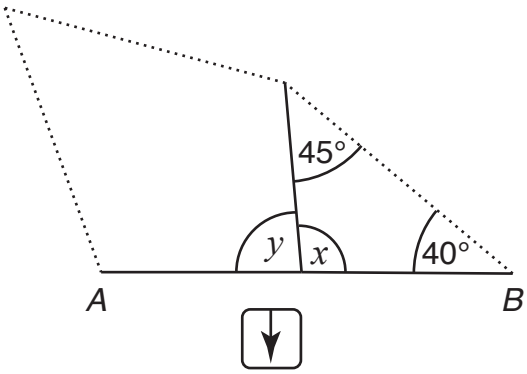
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1 a The diagram shows a triangle.
Calculate the value of angle x.



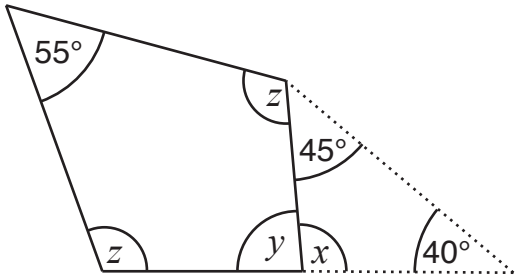
Answer _____ °

1 b *AB* is a straight line.
Calculate the value of angle y.



Answer _____ °

1 c The diagram shows a quadrilateral.
Calculate the value of angle z.



Answer _____ °

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13.12 Angles: Test

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1

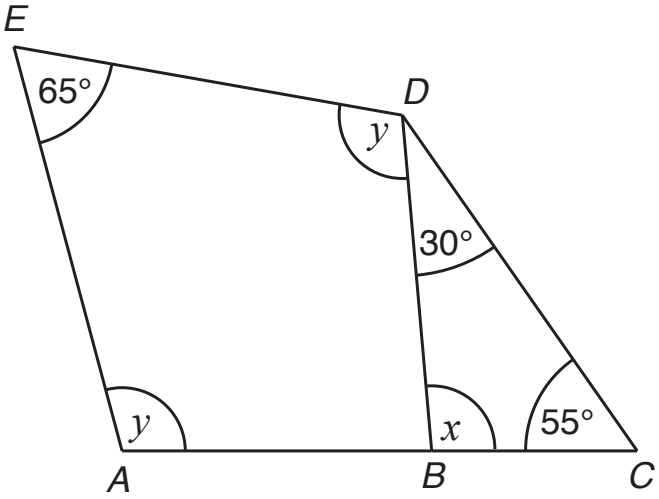


Diagram not drawn to scale

ABC is a straight line.
BCD is a triangle.
ABDE is a quadrilateral.

1 a Work out the value of x

Answer _____

1 b Work out the value of y

Answer _____

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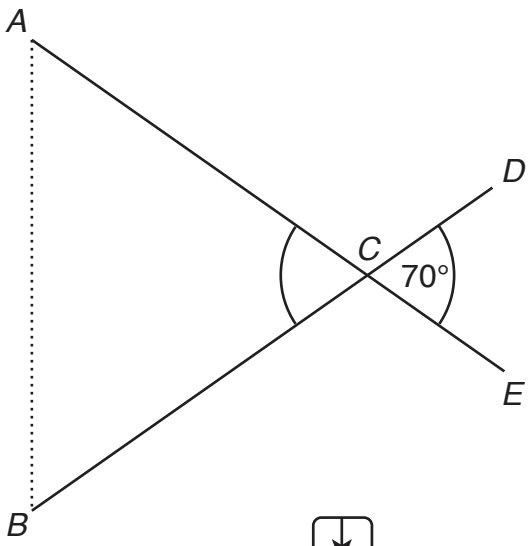
13.13 Angles 1

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1 a *ACE* and *BCD* are straight lines.
Angle *ACB* is vertically opposite to angle *DCE*.

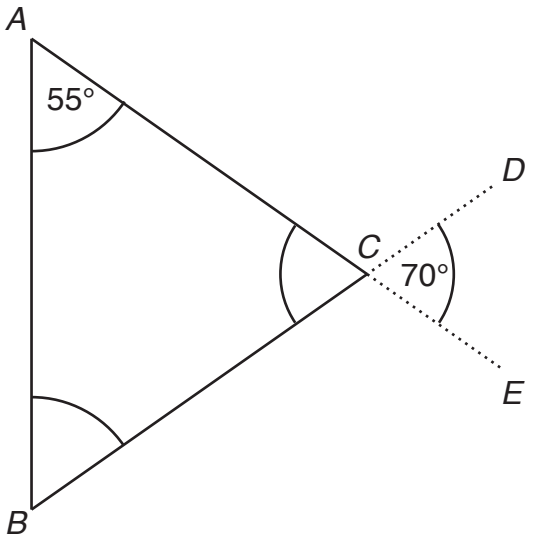
Write down the value of angle *ACB*.



Answer _____ °

1 b *ABC* is a triangle.

Work out the value of angle *ABC*.



Answer _____ °

1 c What type of triangle is ABC?
Tick your answer.

☐ Equilateral triangle

☐ Isosceles triangle

☐ Scalene triangle

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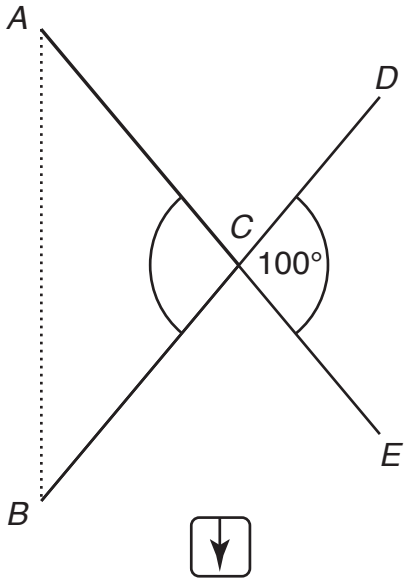
13.13 Angles 2

F/H

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1 a *ACE* and *BCD* are straight lines.
Angle *ACB* is vertically opposite to angle *DCE*.

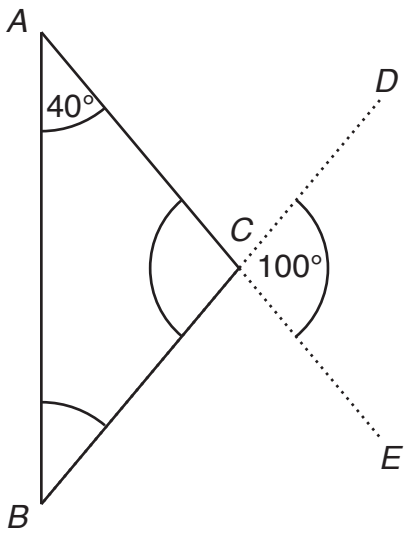
Write down the value of angle *ACB*.



Answer _____ °

1 b *ABC* is a triangle.

Work out the value of angle *ABC*.



Answer _____ °

1 c What type of triangle is ABC?
Tick your answer.

☐ Equilateral triangle

☐ Isosceles triangle

☐ Scalene triangle

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1

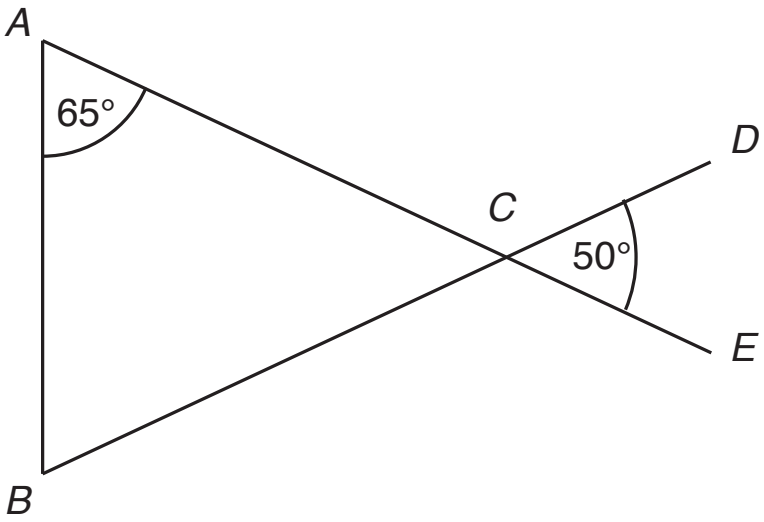


Diagram not drawn to scale

ACE and *BCD* are straight lines.

Show that triangle *ABC* is an isosceles triangle.
You *must* show each stage of your working.

Answer _____

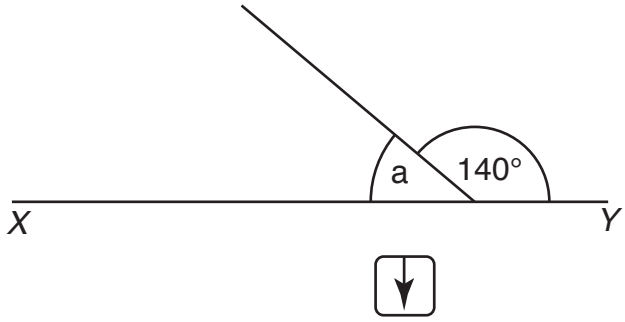
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13.14 Angles 1

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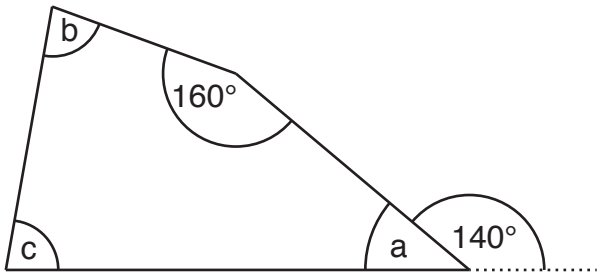
1 a *XY* is a straight line.
Find the size of angle a.
Give a reason for your answer.



Angle _____ °

Reason _____

1 b The diagram shows a quadrilateral.
The sum of the angles in a quadrilateral equals 360°
Calculate the sum of angle b and angle c.



angle b + angle c = ☐ °

1 c Angle b = angle c
Calculate the size of angle b.

☐ ÷ 2 = ☐ °

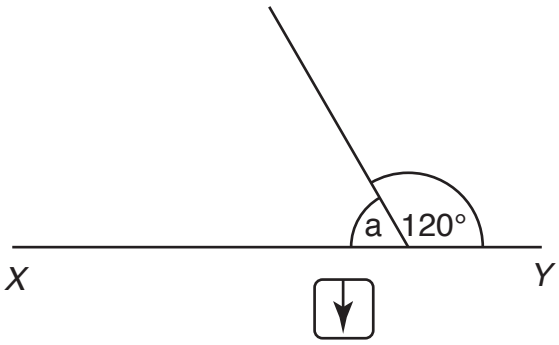
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13.14 Angles 2

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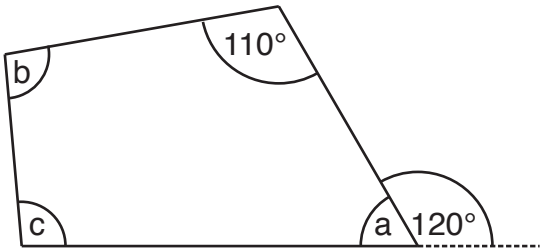
1 a *XY* is a straight line.
Find the size of angle a.
Give a reason for your answer.



Angle _____ °

Reason _____

1 b The diagram shows a quadrilateral.
The sum of the angles in a quadrilateral equals 360°
Calculate the sum of angle b and angle c.



angle b + angle c = ☐ °

1 c Angle b = angle c
Calculate the size of angle b.

☐ ÷ 2 = ☐ °

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13.14 Angles: Test

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1

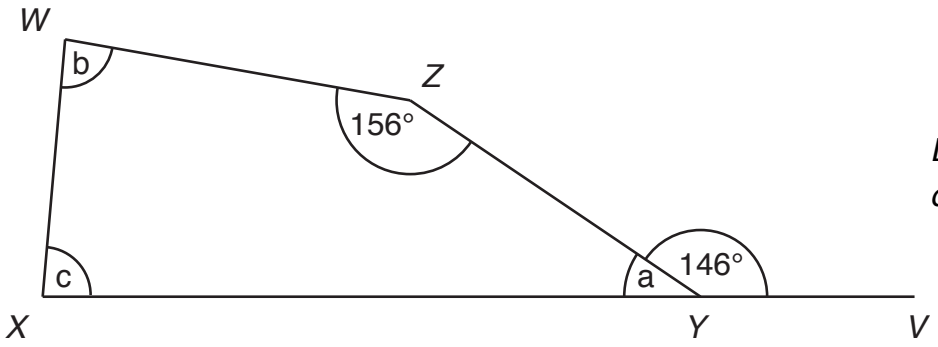


Diagram not drawn to scale

WXYZ is a quadrilateral.
XYV is a straight line.

1a Find the size of angle a.
Give a reason for your answer.

Angle _____

Reason _____

1b Angle b = angle c
Find the size of angle b

Answer _____

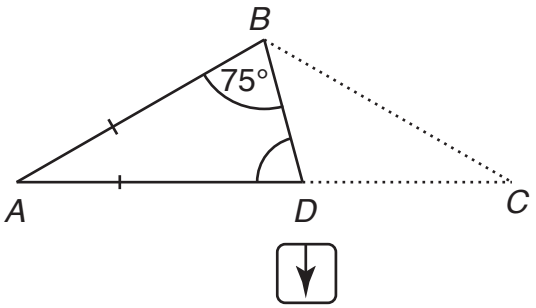
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13.15 Angles 1

F/H

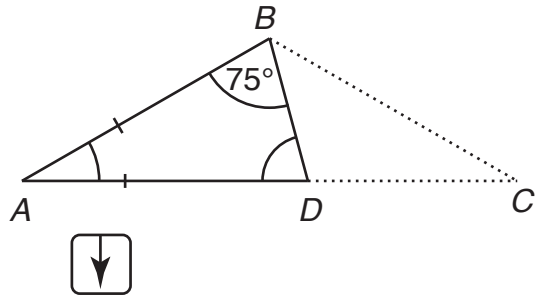
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1 a *ABD* is an isosceles triangle with *AB* = *AD.*
Write down the size of angle *ADB.*



Answer _____ °

1 b The sum of the angles in a triangle equals 180°.
Calculate the size of angle *BAD*.

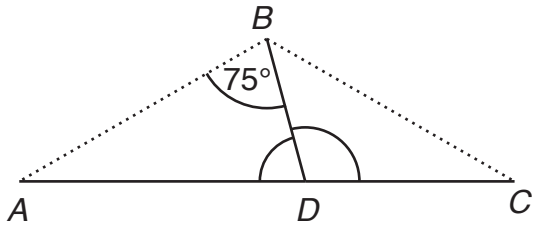


_____

_____

Answer _____ °

1 c The sum of the angles on a straight line equals 180°.
Calculate the size of angle *BDC*.

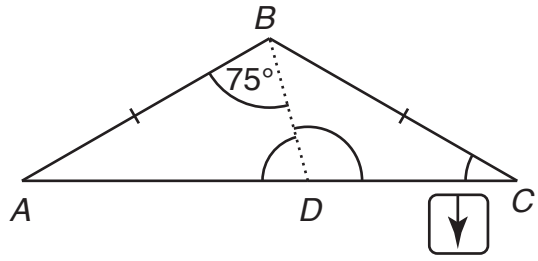


_____

_____

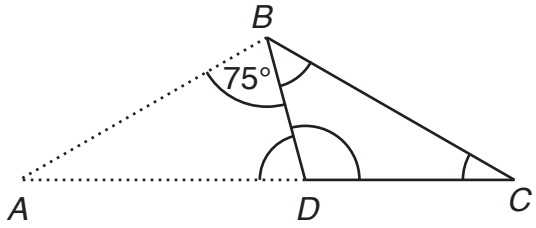
Answer _____ °

1 d *ABC* is an isosceles triangle with *BA* = *BC.*
Write down the size of angle *BCA.*



Answer _____ °

1 e Calculate the size of angle *CBD*.



_____

_____

Answer _____ °

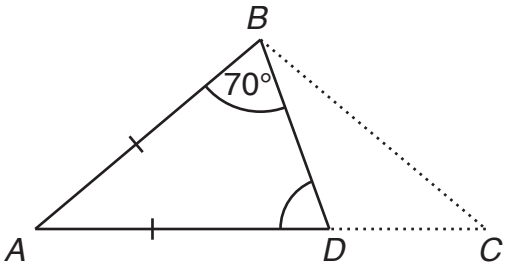
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13.15 Angles 2

F/H

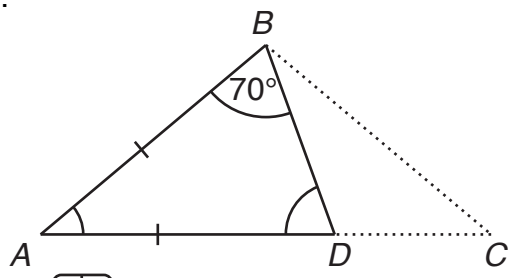
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1 a *ABD* is an isosceles triangle with *AB* = *AD.*
Write down the size of angle *ADB.*



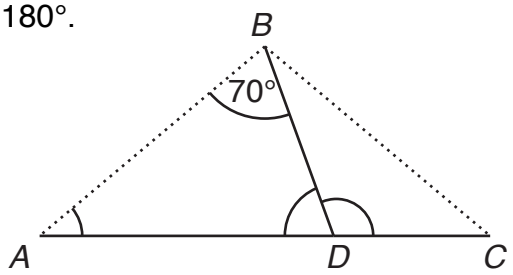
Answer _____ °

1 b The sum of the angles in a triangle equals 180°.
Calculate the size of angle *BAD*.



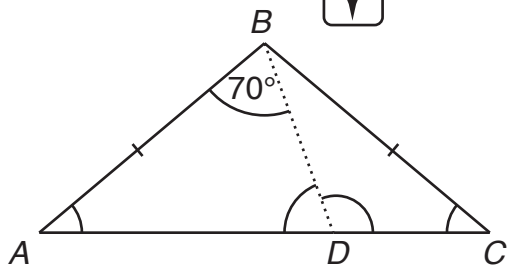
Answer _____ °

1 c The sum of the angles on a straight line equals 180°.
Calculate the size of angle *BDC*.



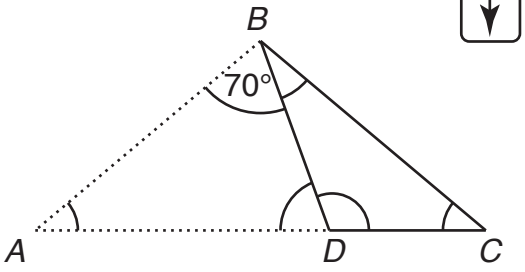
Answer _____ °

1 d *ABC* is an isosceles triangle with *BA* = *BC.*
Write down the size of angle *BCA.*



Answer _____ °

1 e Calculate the size of angle *CBD*.



Answer _____ °

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13.15 Angles: Test

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1

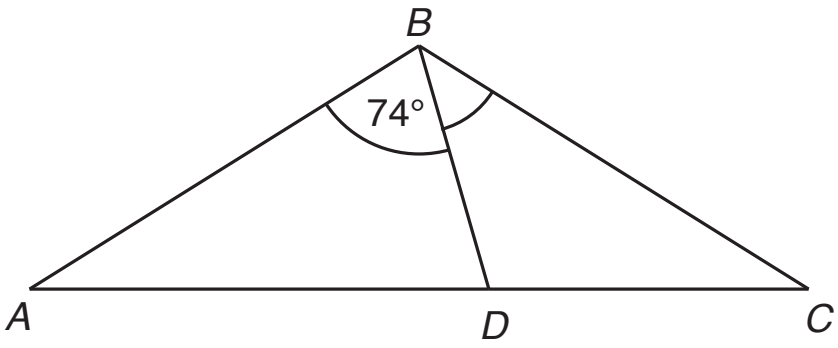


Diagram not drawn to scale

ABC is an isosceles triangle with *BA* = *BC.*

D lies on the line *AC*.

ABD is an isosceles triangle with *AB* = *AD.*

Angle *ABD* = 74°

Calculate angle *CBD*.

You must give a reason for each stage of your working.

Answer _____

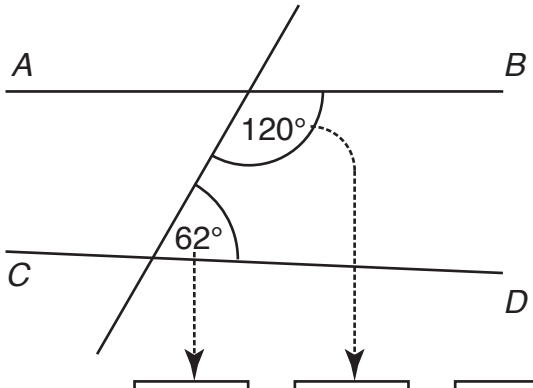
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13.16 Angles 1

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1 The diagram shows three straight lines.

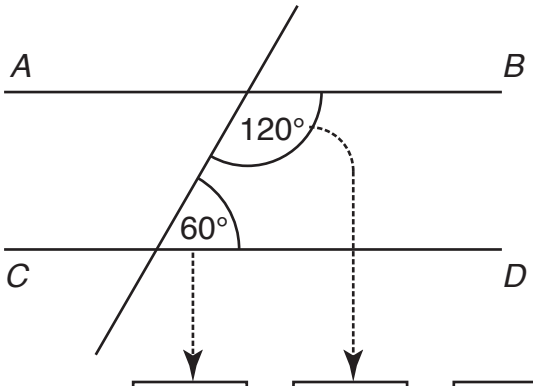


1a Find the sum of the angles. ☐ + ☐ = ☐ °

1b Co-interior angles between parallel lines add up to 180°.
Is *AB* parallel to *CD*?
Tick your answer.

☐ Yes ☐ No

2 The diagram shows three straight lines.



2a Find the sum of the angles. ☐ + ☐ = ☐ °

2b Co-interior angles between parallel lines add up to 180°.
Is *AB* parallel to *CD*?
Tick your answer.

☐ Yes ☐ No

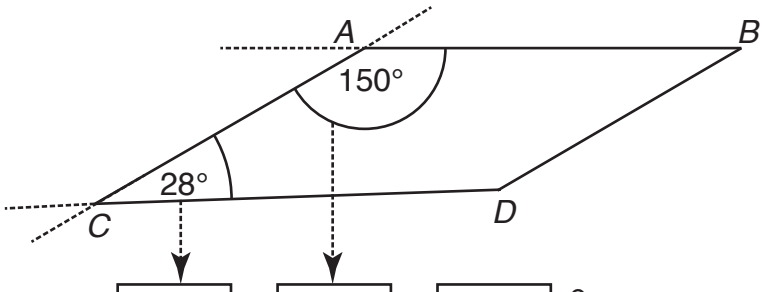
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13.16 Angles 2

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1 The diagram shows a quadrilateral *ABCD*.

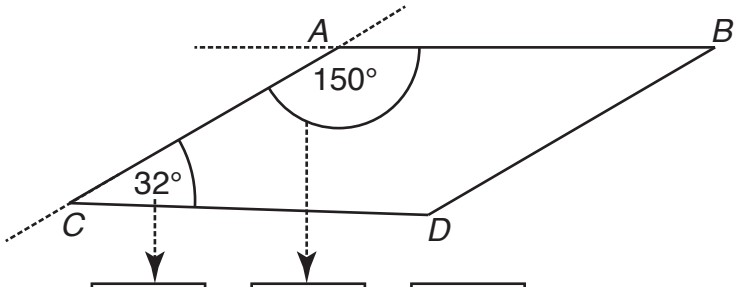


1a Find the sum of the angles. ☐ + ☐ = ☐ °

1b Co-interior angles between parallel lines add up to 180°.
Is *AB* parallel to *CD*?
Tick your answer.

☐ Yes ☐ No

2 The diagram shows a quadrilateral *ABCD*.



2a Find the sum of the angles. ☐ + ☐ = ☐ °

2b Co-interior angles between parallel lines add up to 180°.
Is *AB* parallel to *CD*?
Tick your answer.

☐ Yes ☐ No

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13.16 Angles: Test

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1 The diagram shows a quadrilateral *ABCD*.

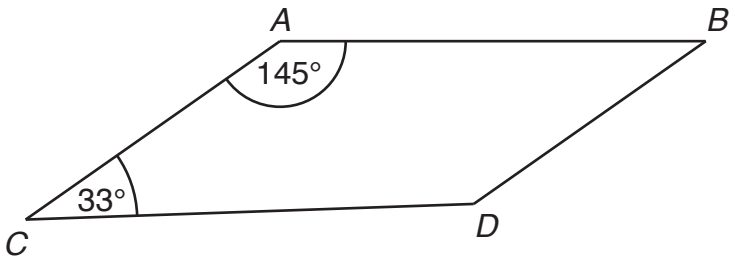


Diagram not drawn to scale

Is AB parallel to CD?

You must give your reasoning.

Answer _____

2 The diagram shows a quadrilateral *ABCD*.

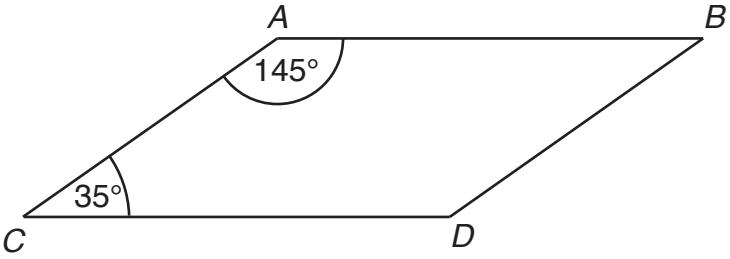


Diagram not drawn to scale

Is AB parallel to CD?

You must give your reasoning.

Answer _____

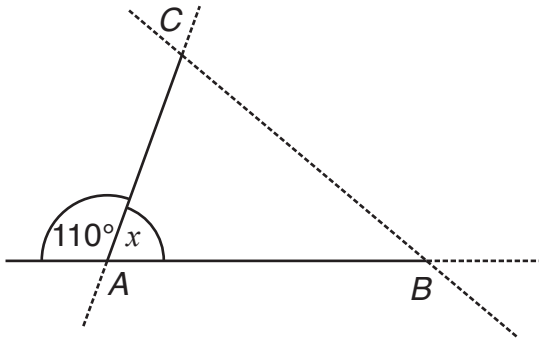
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13.17 Angles 1

F/H

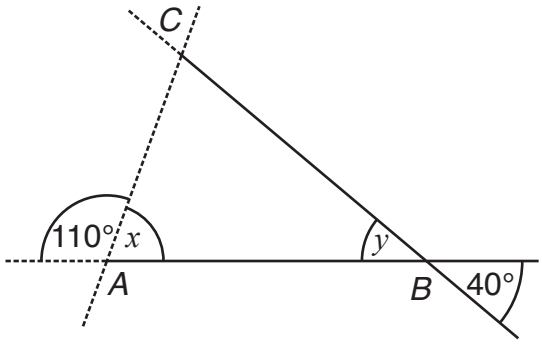
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1 a Here is a triangle *ABC* with each of its sides extended.
The sum of the angles on a straight line is 180°.
Calculate angle x.



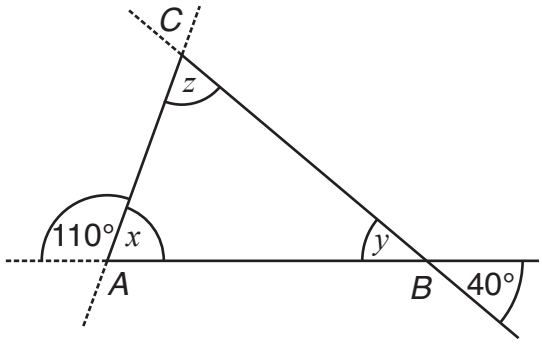
Answer _____ °

1 b Vertically opposite angles are equal.
Calculate angle y.



Answer _____ °

1 c The sum of the angles in a triangle equals 180°.
Calculate angle z.



Answer _____ °

1 d What type of triangle is triangle *ABC*?
Tick your answer.

☐ Isosceles ☐ Equilateral ☐ Scalene

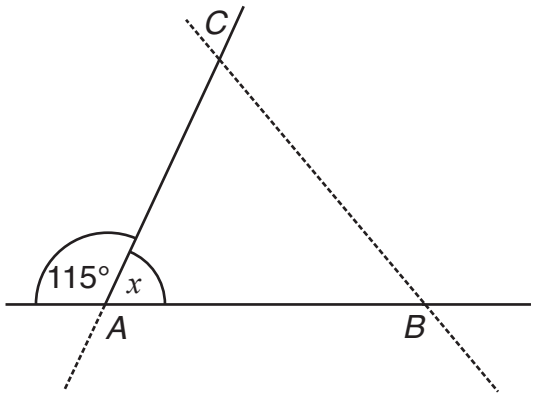
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13.17 Angles 2

F/H

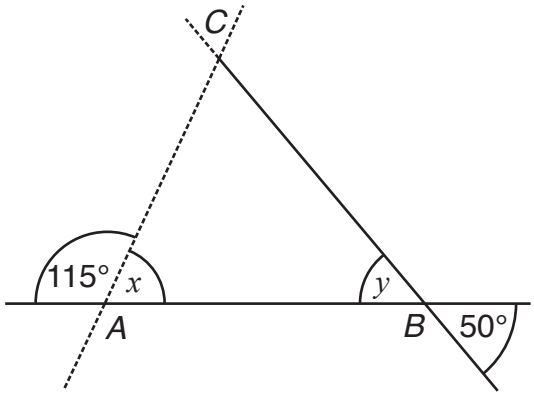
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1 a Here is a triangle *ABC* with each of its sides extended.
The sum of the angles on a straight line is 180°.
Calculate angle x.



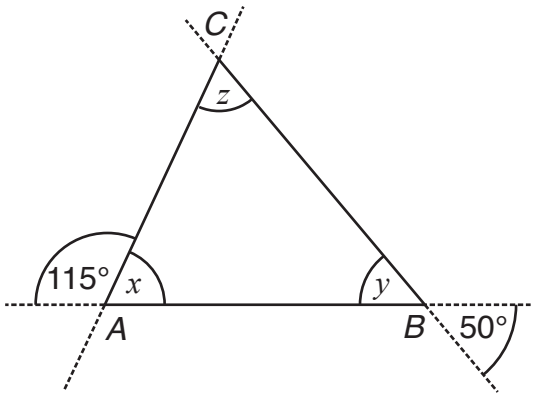
Answer _____ °

1 b Vertically opposite angles are equal.
Calculate angle y.



Answer _____ °

1 c The sum of the angles in a triangle equals 180°.
Calculate angle z.



Answer _____ °

1 d What type of triangle is triangle *ABC*?
Tick your answer.

☐ Isosceles ☐ Equilateral ☐ Scalene

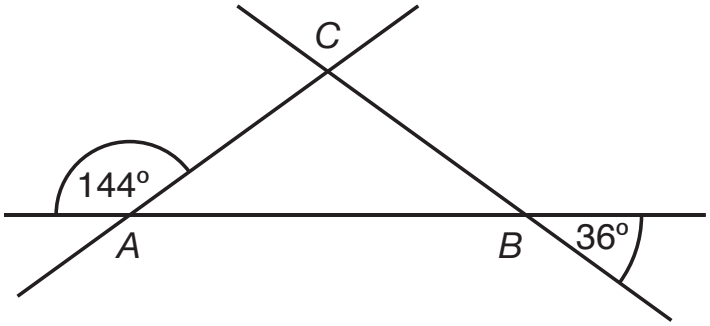
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13.17 Angles: Test

F/H

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1 Here is a triangle *ABC* with each of its sides extended.



Show that triangle *ABC* is isosceles.

Answer _____

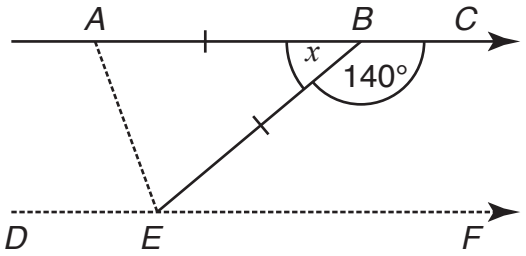
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13.18 Angles 1

F/H

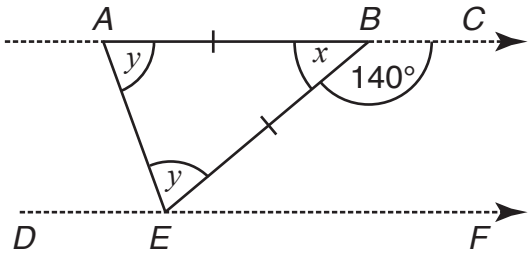
Licensed to The King's School, Devon

1 a *ABC* and *DEF* are parallel straight lines.
The sum of the angles on a straight line is 180°.
Calculate angle x.



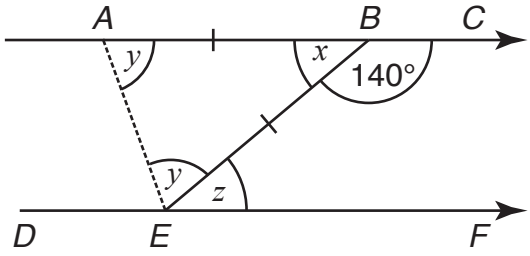
Answer _____ °

1 b *ABE* is an isosceles triangle.
The sum of the angles in a triangle equals 180°.
Calculate angle y.



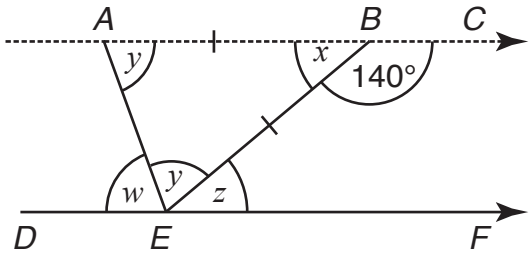
Answer _____ °

1 c Alternate angles are equal.
Write down the size of angle z.



Answer _____ °

1 d The sum of the angles on a straight line equals 180°.
Calculate the size of angle w.



Answer _____ °

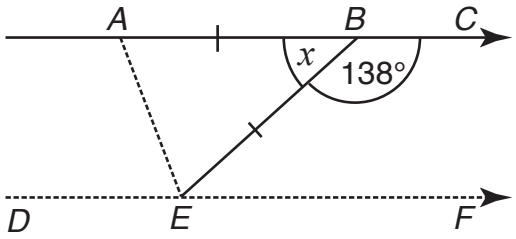
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13.18 Angles 2

F/H

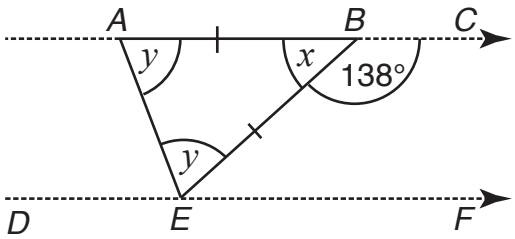
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1 a *ABC* and *DEF* are parallel straight lines.
The sum of the angles on a straight line is 180°.
Calculate angle x.



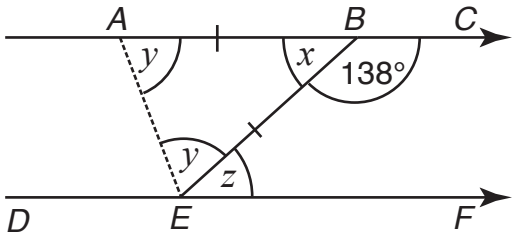
Answer _____ °

1 b *ABE* is an isosceles triangle.
The sum of the angles in a triangle equals 180°.
Calculate angle y.



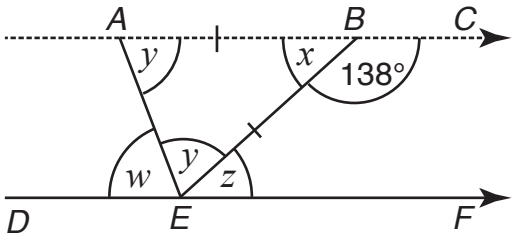
Answer _____ °

1 c Alternate angles are equal.
Write down the size of angle z.



Answer _____ °

1 d The sum of the angles on a straight line equals 180°.
Calculate the size of angle w.



Answer _____ °

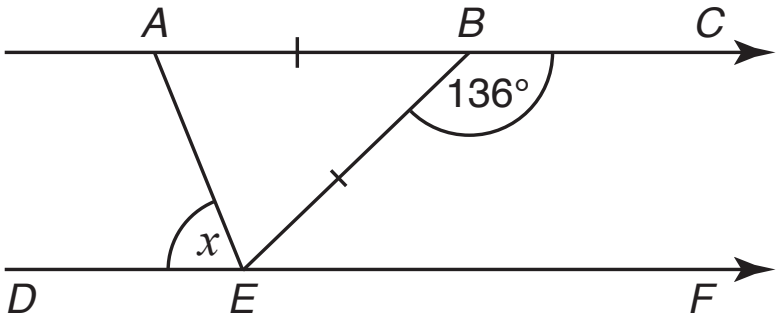
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13.18 Angles: Test

F/H

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1



ABC and *DEF* are parallel straight lines.
ABE is an isosceles triangle with *AB* = *BE.*
Angle *CBE* = 136°.

Work out the size of angle x.
Give a reason for each stage in your working.

Answer _____

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14 Speed

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14.2	Speed fractions of an hour advanced	573
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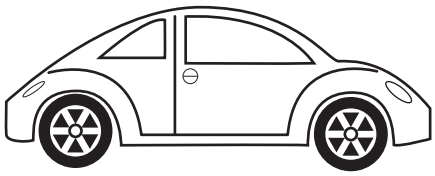
14.1 Speed fractions of an hour introduction 1

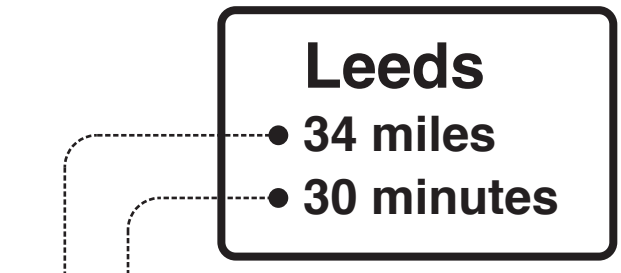
F/H

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1 Phoebe and Jakub are driving along a motorway.

They see a road sign.
The sign shows the distance to Leeds.
It also shows the average time drivers take to get to Leeds.





1a Write 30 minutes as a fraction of 1 hour.

$\frac{\square}{60}$ hour

1b A car travels 34 miles in 30 minutes.
Calculate the average speed.

$\square \div \frac{\square}{60} = \square$ mph

Distance ÷ Time = Speed

1c The speed limit on the motorway is 70 mph.
Is the average speed more than or less than the speed limit?

☐ less than the speed limit

☐ more than the speed limit

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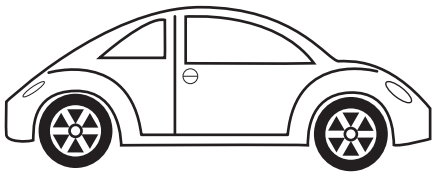
14.1 Speed fractions of an hour introduction 2

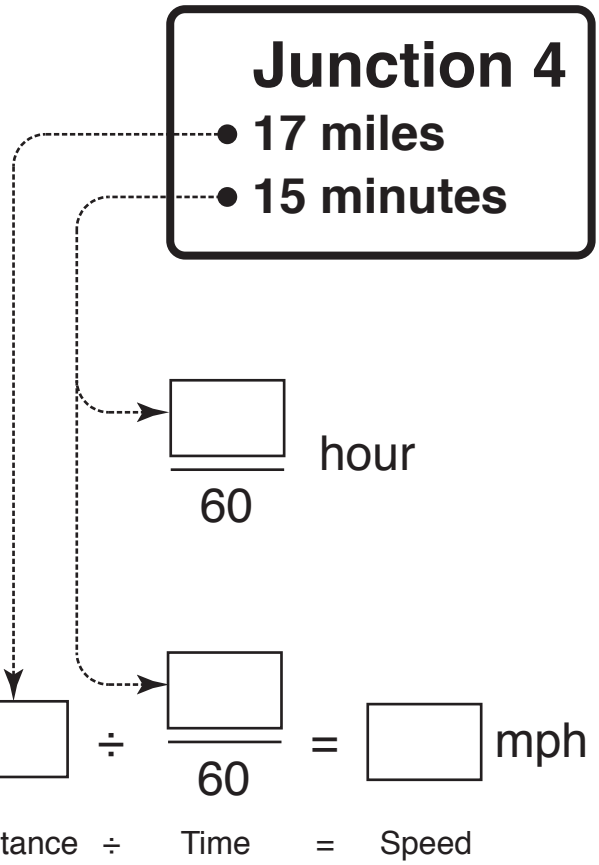
F/H

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1 Chloe and Joe are driving along a motorway.

They see a road sign.
The sign shows the distance to Junction 4.
It also shows the average time drivers take to get to Junction 4.





1a Write 15 minutes as a fraction of 1 hour.

1b A car travels 17 miles in 15 minutes.
Calculate the average speed.

1c The speed limit on the motorway is 70 mph.
Is the average speed more than or less than the speed limit?

☐ less than the speed limit

☐ more than the speed limit

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14.1 Speed fractions of an hour introduction: Test

F/H

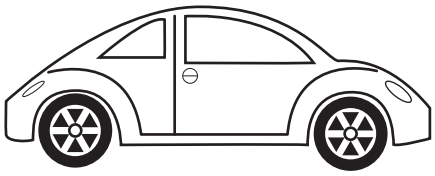
Licensed to The King's School, Devon

1 Jordan and Emily are driving along a motorway.

They see a road sign.

The road sign shows the distance to Junction 4.
It also shows the average time divers take to get to Junction 4.

Junction 4
- **48 miles**
- **45 minutes**



The speed limit on the motorway is 70 mph.

Jordan says

'We can stay within the speed limit to drive 48 miles in 45 minutes.'

Is Jordan correct?
You **must** show how you get your answer.

Answer _____

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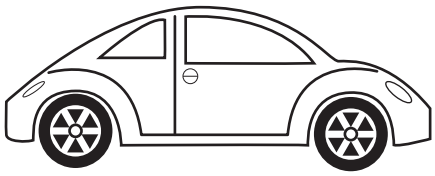
14.2 Speed fractions of an hour advanced 1

F/H

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1 Callum and Meg are driving along a motorway.

They see a road sign.
The sign shows the distance to Bristol.
It also shows the average time drivers take to get to Bristol.





1a Write 25 minutes as a fraction of 1 hour.

$\frac{\square}{60}$ hour

1b A car travels 28 miles in 25 minutes.
Calculate the average speed.

$\square \div \frac{\square}{60} = \square$ mph

Distance ÷ Time = Speed

1c The speed limit on the motorway is 70 mph.

Calum says

'We can stay within the speed limit to drive 28 miles in 25 minutes.'

Is Calum correct?
Tick your answer.

☐ Callum is correct ☐ Callum is **not** correct

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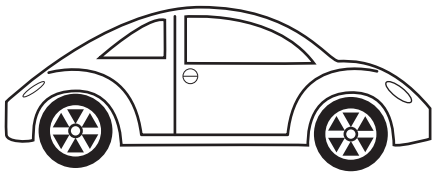
14.2 Speed fractions of an hour advanced 2

F/H

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1 Lyander and Jack are driving along a motorway.

They see a road sign.
The sign shows the distance to Junction 3.
It also shows the average time drivers take to get to Junction 3.





1a Write 36 minutes as a fraction of 1 hour.

$\frac{\square}{60}$ hour

1b A car travels 42 miles in 36 minutes.
Calculate the average speed.

$\square \div \frac{\square}{60} = \square$ mph

Distance ÷ Time = Speed

1c The speed limit on the motorway is 70 mph.

Lyander says

'We can stay within the speed limit to drive 42 miles in 36 minutes.'

Is Lyander correct?
Tick your answer.

☐ Lyander is correct

☐ Lyander is **not** correct

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14.2 Speed fractions of an hour advanced: Test

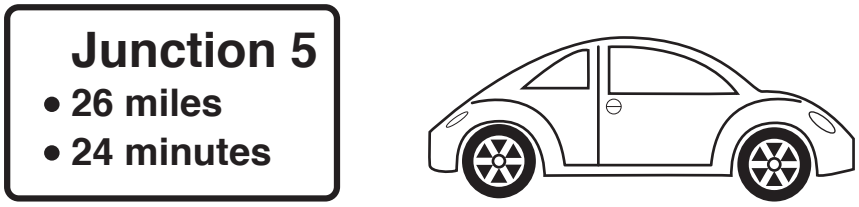
F/H

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1 Jake and Rhiann are driving along a motorway.

They see a road sign.

The road sign shows the distance to Junction 5.
It also shows the average time divers take to get to Junction 5.



The speed limit on the motorway is 70 mph.

Jake says

'We can stay within the speed limit to drive 26 miles in 24 minutes.'

Is Jake correct?
You **must** show how you get your answer.

Answer _____

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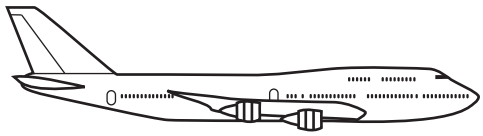
14.3 Speed and changes introduction 1

F/H

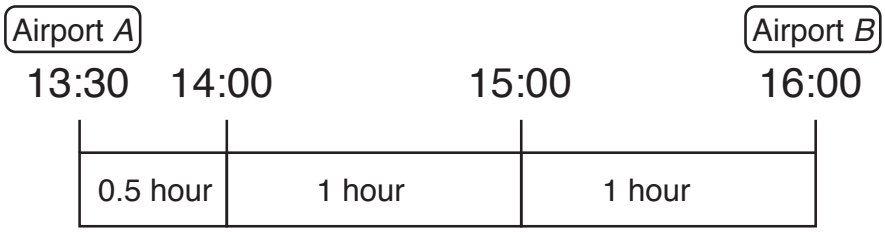
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1 The direct route between two airports *A* and *B* is 750 km.

An aircraft leaves *A* at 13:30
It arrives at *B* at 16:00



1a Calculate the time taken by the aircraft to fly from airport *A* to airport *B*.



[.] hours

1b The direct route between the airports *A* and *B* is 750 km.
Work out the average speed of the aircraft.
Assume the aircraft travelled the direct route.

[ ] ÷ [ ] = [ ] km/h

Distance Time Speed

1c In fact the aircraft took a longer route.
The route taken by the aircraft was 800 km.
Calculate the average speed.

[ ] ÷ [ ] = [ ] km/h

Distance Time Speed

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14.3 Speed and changes introduction 2

F/H

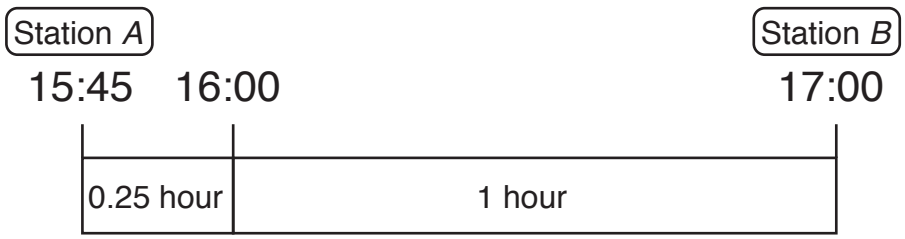
Licensed to The King's School, Devon

1 The direct route between two railway stations *A* and *B* is 120 km.

A train leaves *A* at 15:45
It arrives at *B* at 17:00



1a Calculate the time taken by the train to travel from station *A* to station *B*.



hours

1b The direct route between stations *A* and *B* is 120 km.
Work out the average speed of the train.
Assume the train travelled the direct route.

	÷		=		
		.			km/h
Distance		Time		Speed	

1c In fact the train took a longer route.
The route taken by the train was 140 km.
Calculate the average speed.

	÷		=		
					km/h
Distance		Time		Speed	

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14.3 Speed and changes introduction: Test

F/H

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1a The direct route between two railway stations *A* and *B* is 60 km.

A train leaves *A* at 16:45
It arrives at *B* at 17:30

Work out the average speed of the train.
Assume the train travelled the direct route.

Answer _____

1b In fact the train did **not** travel the direct route.

How does this affect the average speed?
Tick a box.

☐ Faster ☐ Slower ☐ The same

Give a reason for your answer.

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14.4 Speed and changes next steps 1

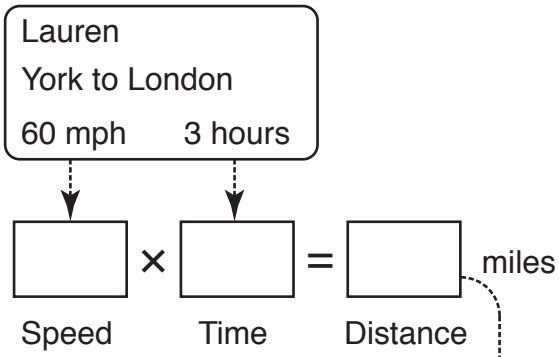
F/H

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1a Lauren drove from York to London.

It took her 3 hours.
Her average speed was 60 mph.

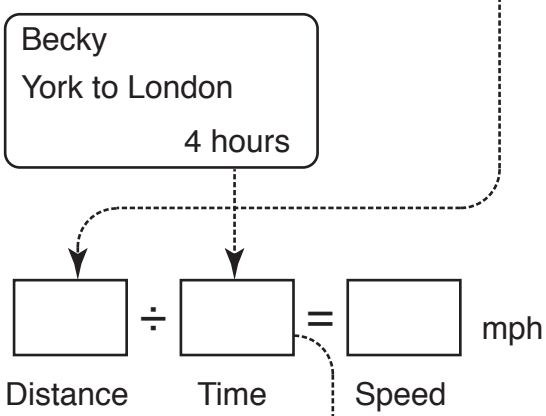
Calculate the distance from York to London.



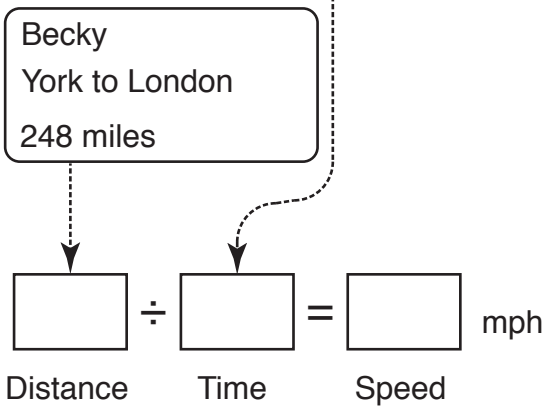
1b Becky drove from York to London.
She took 4 hours.
Assuming that Becky

drove along the same route as Lauren
and did not take a break,

work out Becky's average speed from
York to London.



1c In fact Becky took a longer route.
The route that Becky took was 248 miles.
Calculate Becky's average speed from
York to London.



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14.4 Speed and changes next steps 2

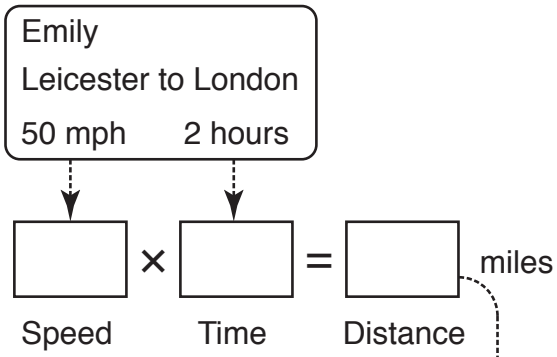
F/H

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1a Emily drove from Leicester to London.

It took her 2 hours.
Her average speed was 50 mph.

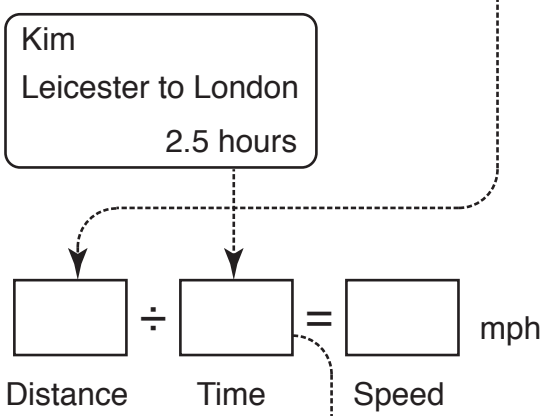
Calculate the distance from Leicester to London.



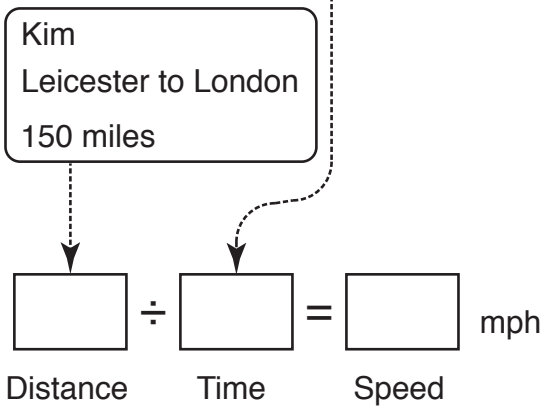
1b Kim drove from Leicester to London.
She took 2.5 hours.
Assuming that Kim

drove along the same route as Emily and did not take a break,

work out Kim's average speed from Leicester to London.



1c In fact Kim took a longer route.
The route that Kim took was 150 miles.
Calculate Kim's average speed from Leicester to London.



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14.4 Speed and changes next steps : Test

F/H

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1a James drives from Nottingham to London.

It took him 2 hours.
His average speed was 60mph.

Calculate the distance from Nottingham to London.

Answer _____

1b Kim drove from Nottingham to London.
She took 3 hours.
Assuming that Kim

drove along the same route as James
and did not take a break,

work out Kim's average speed from
Nottingham to London.

Answer _____

1c In fact, Kim took a longer route from Nottingham to London.
How does this affect her average speed?
You must give a reason for your answer.

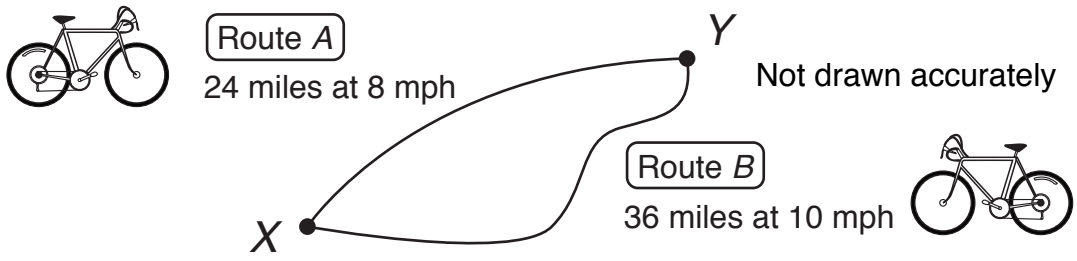
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14.5 Speed and changes extension 1

F/H

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1 The diagram shows two routes between two towns *X* and *Y*.
The distance and average speed to cycle each route is shown.



1a Which of the two routes takes the **longest** time?
Assume the average speeds given.

Route *A*

☐ ÷ ☐ = ☐ hours

Distance Speed Time

Route *B*

☐ ÷ ☐ = ☐ hours

Distance Speed Time

Tick a box ☐ Route *A* ☐ Route *B*

1b Will cycles from *X* to *Y* along route *A*.
He cycles 4 mph faster than the average speed.
Calculate the time he takes.

8 + 4 = ☐

Route *A*

☐ ÷ ☐ = ☐ hours

Distance Speed Time

1c Chloe cycles from *X* to *Y* along route *B*.
She takes the same time as Will.
Calculate the average speed for her journey.

Route *B*

☐ ÷ ☐ = ☐ mph

Distance Time Speed

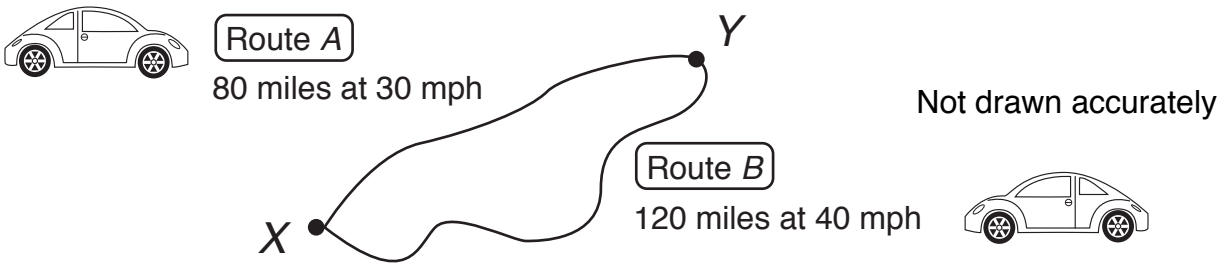
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14.5 Speed and changes extension 2

F/H

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1 The diagram shows two routes between two towns *X* and *Y*.
The distance and average speed for each route is shown.



1a Which of the two routes takes the **longest** time?
Assume the average speeds given.

Route *A*

$\square \div \square = \square$ hours

Distance Speed Time

Route *B*

$\square \div \square = \square$ hours

Distance Speed Time

Tick a box ☐ Route *A* ☐ Route *B*

1b Beth travels from *X* to *Y* along route *A*.
She travels 10 mph faster than the average speed.
Calculate the time she takes.

$30 + 10 = \square$

Route *A*

$\square \div \square = \square$ hours

Distance Speed Time

1c Connor travels from *X* to *Y* along route *B*.
He takes the same time as Beth.
Calculate the average speed for his journey.

Route *B*

$\square \div \square = \square$ mph

Distance Time Speed

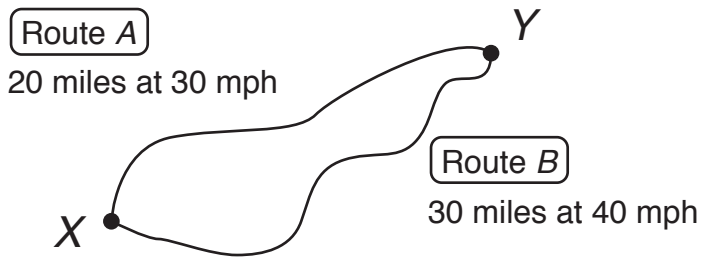
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14.5 Speed and changes extension: Test

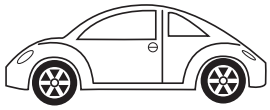
F/H

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1 The diagram shows two routes, *A* and *B*, between two towns *X* and *Y*.
The distance and average speed for each route is shown.



Not drawn accurately



1a Which of the two routes takes the longest time?
Assume the average speeds given.

Answer _____

1b Joe and Meg take the same time to travel from X to Y.

Joe travels along route A at 10 mph faster than the average speed.
Meg travels along route B.

Does Meg travel faster or slower than the average speed for route B?

Answer _____

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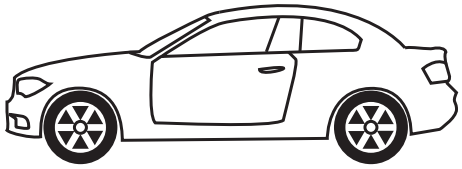
14.6 Speed multistep journeys introduction 1

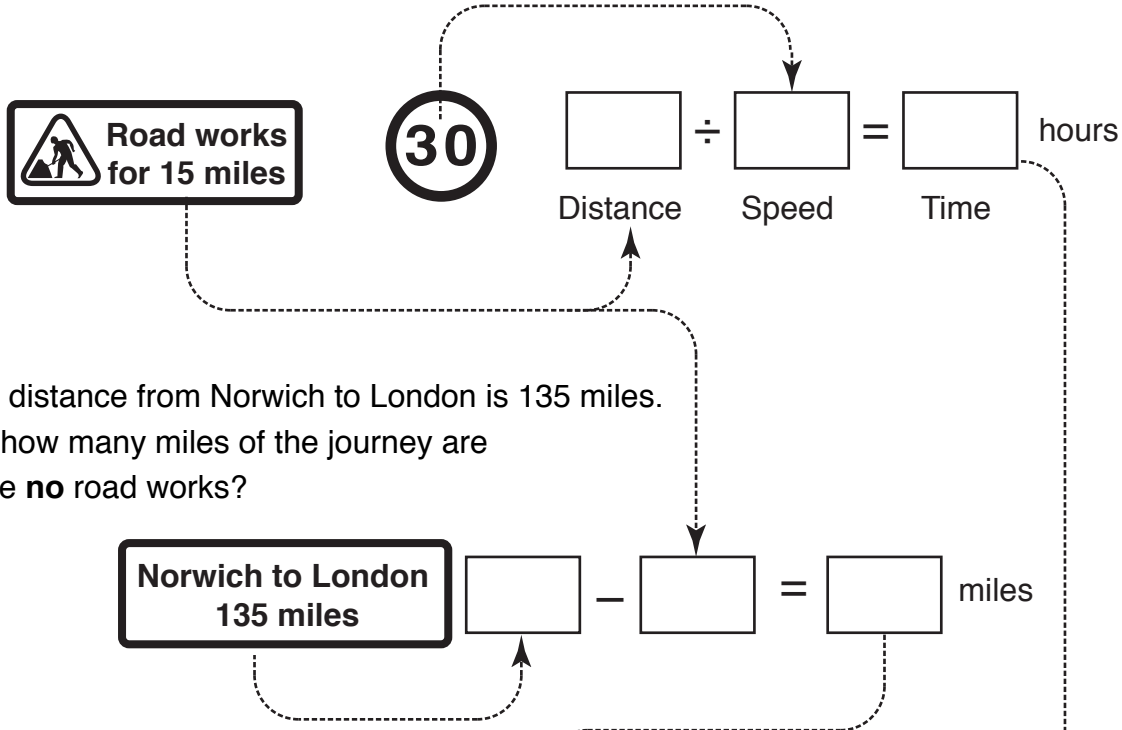
F/H

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1 Toby is going to drive from Norwich to London.

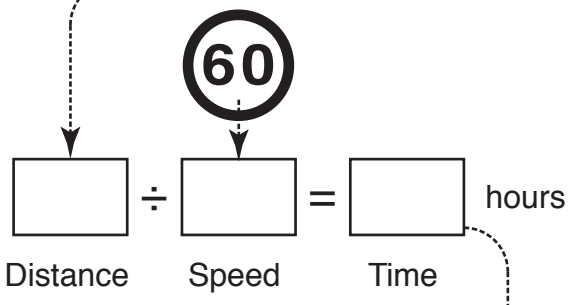
1a There are road works for 15 miles of the journey.
Toby travels at an average speed of 30 mph
where there are roadworks.
Work out his journey time where there are road works.



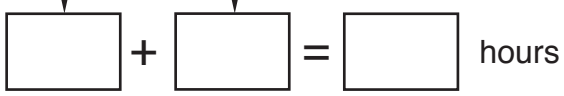


1b The distance from Norwich to London is 135 miles.
For how many miles of the journey are
there **no** road works?

1c Toby travels at an
average speed of 60 mph
where there are **no** roadworks.
Work out his journey time where
there are no road works.



1d Work out the total journey time
from Norwich to London.



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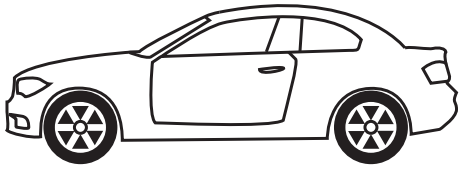
14.6 Speed multistep journeys introduction 2

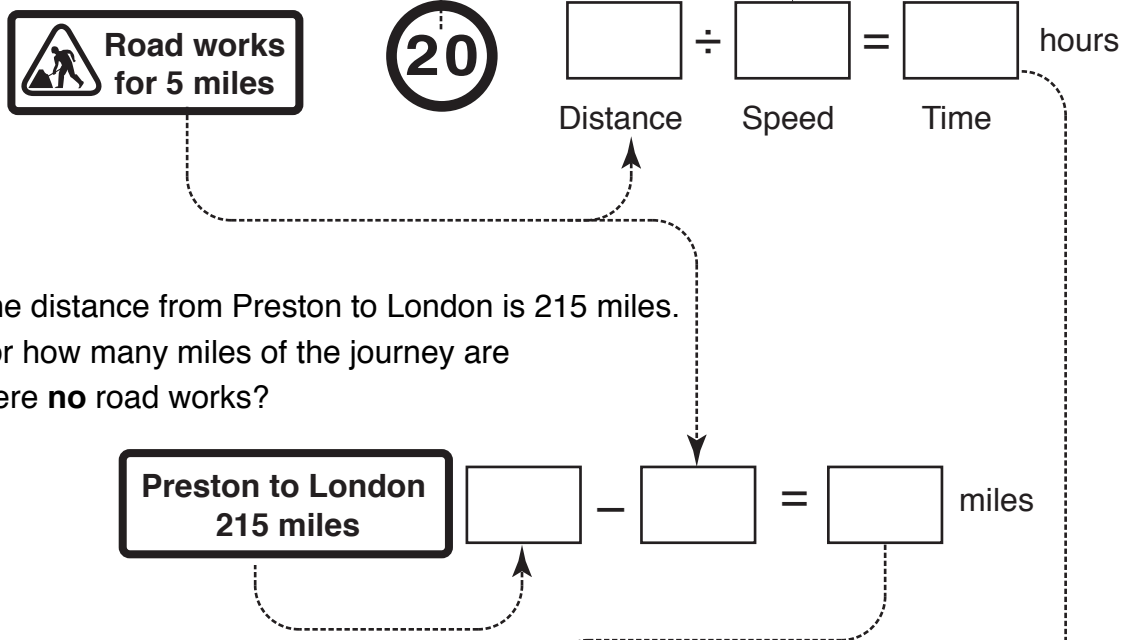
F/H

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1 Emily is going to drive from Preston to London.

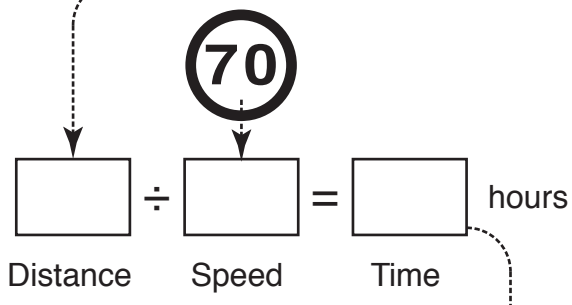
1a There are road works for 5 miles of the journey.
Emily travels at an average speed of 20 mph
where there are road works.
Work out her journey time where there are road works.



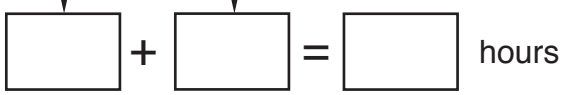


1b The distance from Preston to London is 215 miles.
For how many miles of the journey are
there **no** road works?

1c Emily travels at an
average speed of 70 mph
where there are **no** road works.
Work out her journey time where
there are no road works.



1d Work out the total journey time
from Preston to London.



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14.6 Speed multistep journeys introduction: Test

F/H

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1a Maddy is going to drive 110 miles from Nottingham to London.

There are road works for 10 miles of the journey.

She assumes her average speed will be

20 mph where there are road works

50 mph for the rest of the journey.

Using her assumptions, work out her journey time.

Answer _____

1b Maddy's assumptions about her average speeds are too low.

How does this affect her journey time?

Tick a box.

☐ The journey will take **more** time.

☐ The journey will take **less** time.

☐ The journey will take the same time.

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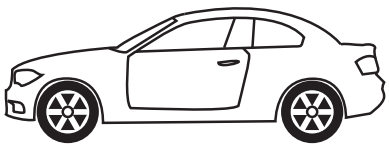
14.7 Speed multistep journeys advanced 1

F/H

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1 Jason is driving home from his friend's house.

1a He drives **5 miles** from his friend's house to the motorway.
His average speed is **20 mph**.
Calculate his journey time.



☐ ÷ ☐ = ☐ Hours

Distance Speed Time

1b Jason drives **200 miles** on the motorway.
His average speed is **50 mph**.
Calculate his journey time.

☐ ÷ ☐ = ☐ Hours

Distance Speed Time

1c Jason drives **10 miles** from the motorway to his home.
His average speed is **40 mph**.
Calculate his journey time.

☐ ÷ ☐ = ☐ Hours

Distance Speed Time

1d Calculate Jason's total journey time.

☐ + ☐ + ☐ = ☐ Hours

1e Jason leaves his friend's house at 16:00
At what time does he arrive home?

Answer _____

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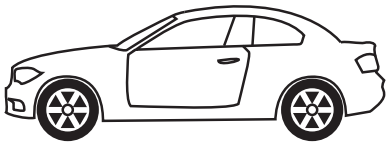
14.7 Speed multistep journeys advanced 2

F/H

Licensed to The King's School, Devon

1 Luke is driving home from his friend's house.

1a He drives **10 miles** from his friend's house to the motorway.
His average speed is **40 mph**.
Calculate his journey time.



☐ ÷ ☐ = ☐ Hours

Distance Speed Time

1b Luke drives **120 miles** on the motorway.
His average speed is **60 mph**.
Calculate his journey time.

☐ ÷ ☐ = ☐ Hours

Distance Speed Time

1c Luke drives **20 miles** from the motorway to his home.
His average speed is **40 mph**.
Calculate his journey time.

☐ ÷ ☐ = ☐ Hours

Distance Speed Time

1d Calculate Luke's total journey time.

☐ + ☐ + ☐ = ☐ Hours

1e Luke leaves his friend's house at 17:30
At what time does he arrive home?

Answer _____

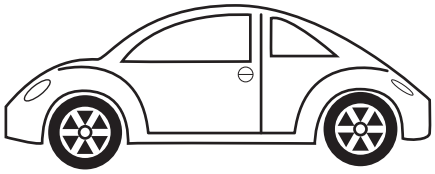
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14.7 Speed multistep journeys advanced: Test

F/H

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1a Megan is driving home from her friend's house.



She drives at an average speed of 20 mph
for the 5 miles from her friend's house to the motorway.

She drives at an average speed of 60 mph for 180 miles on the motorway.

She drives at an average speed of 40 mph
for the 10 miles from the motorway to her home.

She leaves her friend's house at 16: 45
At what time does Megan arrive home?

Answer _____

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15 Percentages

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15.1	Percentage increase introduction	598
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15.3	Increase by a percentage introduction	606
15.4	Increase by a percentage next steps	610
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15.9	Percentage & ratio next steps	630
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15.12	Reverse percentage advanced	642

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15.1 Percentage increase introduction 1

F/H

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1a Kim sells ice creams.
One day she sells 80 ice creams.
The next day she sells 116 ice creams.



Work out the increase in the number of ice creams she sells.

Answer _____

1b Work out the percentage increase in the number of ice creams she sells.

$$\frac{\text{increase}}{\text{original}} = \frac{\square}{80} \times 100 = \square\ \%$$

2a Sophie sells ice creams.
One day she sells 60 ice creams.
The next day she sells 99 ice creams.



Work out the increase in the number of ice creams she sells.

Answer _____

2b Work out the percentage increase in the number of ice creams she sells.

$$\frac{\text{increase}}{\text{original}} = \frac{\square}{60} \times 100 = \square\ \%$$

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15.1 Percentage increase introduction 2

F/H

Licensed to The King's School, Devon

1a Amy sells cans of cola.
One day she sells 40 cans of cola.
The next day she sells 54 cans of cola.



Work out the increase in the number of cans of cola she sells.

Answer _____

1b Work out the percentage increase in the number of cans of cola she sells.

$$\frac{\text{increase}}{\text{original}} \times 100 = \square\ \%$$

2a Sophie sells cans of cola.
One day she sells 40 cans of cola.
The next day she sells 50 cans of cola.



Work out the increase in the number of cans of cola she sells.

Answer _____

2b Work out the percentage increase in the number of cans of cola she sells.

$$\frac{\text{increase}}{\text{original}} \times 100 = \square\ \%$$

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15.1 Percentage increase introduction: Test

F/H

Licensed to The King's School, Devon

1 Paul sells ice creams.
One day he sells 60 ice creams.
The next day he sells 81 ice creams.



Work out the percentage increase in the number of ice creams he sells.

Answer _____

2 Kim sells ice creams.
One day she sells 40 ice creams.
The next day she sells 66 ice creams.



Work out the percentage increase in the number of ice creams she sells.

Answer _____

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15.2 Percentage increase advanced 1

F/H

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1 A and B are two companies.
The table below shows the sales of each company in 2010 and 2016

	Company A	**Company B**
	Sales (£ millions)	Sales (£ millions)
2010	420	120
2016	525	198

1a Work out the increase in sales from 2010 to 2016 for company A.

Answer _____

1b Work out the **percentage** increase in sales from 2010 to 2016 for company A.

Answer _____

1c Work out the increase in sales from 2010 to 2016 for company B.

Answer _____

1d Work out the **percentage** increase in sales from 2010 to 2016 for company B.

Answer _____

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15.2 Percentage increase advanced 2

F/H

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1 C and D are two companies.
The table below shows the sales of each company in 2015 and 2016

	Company C	**Company D**
	Sales (£ millions)	Sales (£ millions)
2015	42	36
2016	56.7	52.2

1a Work out the increase in sales from 2015 to 2016 for company C.

Answer _____

1b Work out the **percentage** increase in sales from 2015 to 2016 for company C.

Answer _____

1c Work out the increase in sales from 2015 to 2016 for company D.

Answer _____

1d Work out the **percentage** increase in sales from 2015 to 2016 for company D.

Answer _____

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15.2 Percentage increase advanced: Test

F/H

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1 A and B are two companies.
The table below shows the sales of each company in 2010 and 2016

	Company A	**Company B**
	Sales (£ millions)	Sales (£ millions)
2015	42	36
2016	56.7	52.2

Which of company A or company B had the largest percentage increase in sales?

Answer _____

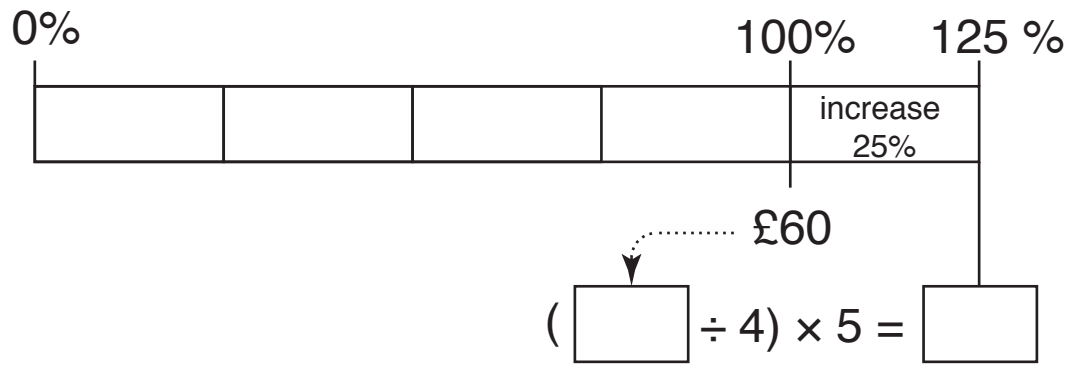
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15.3 Increase by a percentage introduction 1

F/H

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1a Tom gets paid a basic pay £60 per day.
One day, Tom also gets a bonus of 25% of his basic pay.
Work out how much Tom gets.



1b Paul gets paid a basic pay £60 per day.
One day, Paul also gets paid £30 in tips from customers.
Work out how much Paul gets.

Answer _____

1c Work out the difference between the total amounts of money Tom and Paul each get.

Answer _____

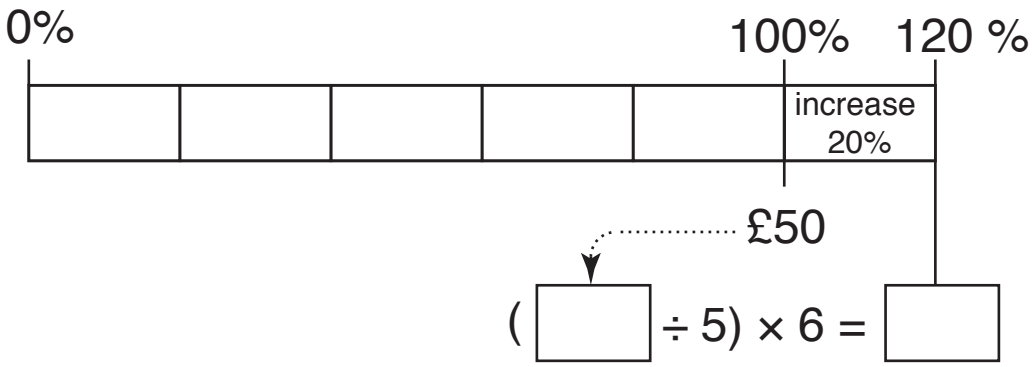
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15.3 Increase by a percentage introduction 2

F/H

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1a Peter gets paid a basic pay £50 per day.
One day, Peter also gets a bonus of 20% of his basic pay.
Work out how much Peter gets.



1b David gets paid a basic pay £50 per day.
One day, David also gets paid £15 in tips from customers.
Work out how much David gets.

Answer _____

1c Work out the difference between the total amounts of money Peter and David each get.

Answer _____

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15.3 Increase by a percentage introduction: Test

F/H

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1 John and Barrie each gets paid a basic pay £80 per day.

One day, John also gets a bonus of 20% of his basic pay.
Barrie also gets £30 in tips from customers.

Work out the difference in the total amounts of money that John and Barrie each get.

Answer _____

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15.4 Increase by a percentage next steps 1

F/H

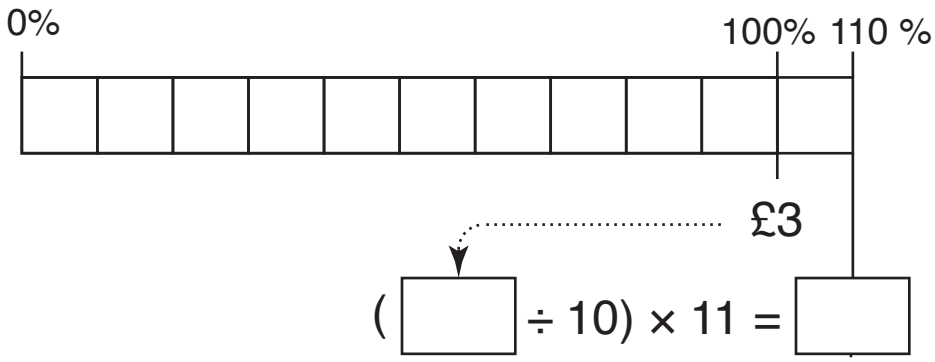
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1a Paul sells hot drinks.

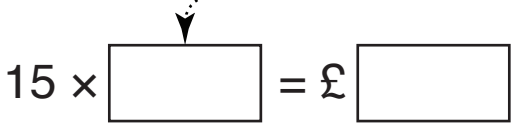


He charges £3 for a hot chocolate
He charges 10% extra for marsh mallows.

Work out how much Paul charges for a hot chocolate with marsh mallows.



1b One day 15 customers buy a hot chocolate with marsh mallows.
Work out the total amount that Paul charges the 15 customers.



1c One day 35 customers buy a hot chocolate without marsh mallows.
Work out the total amount that Paul charges the 35 customers.

Answer _____

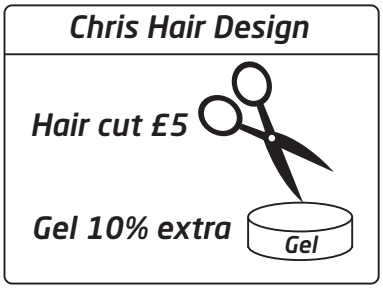
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15.4 Increase by a percentage next steps 2

F/H

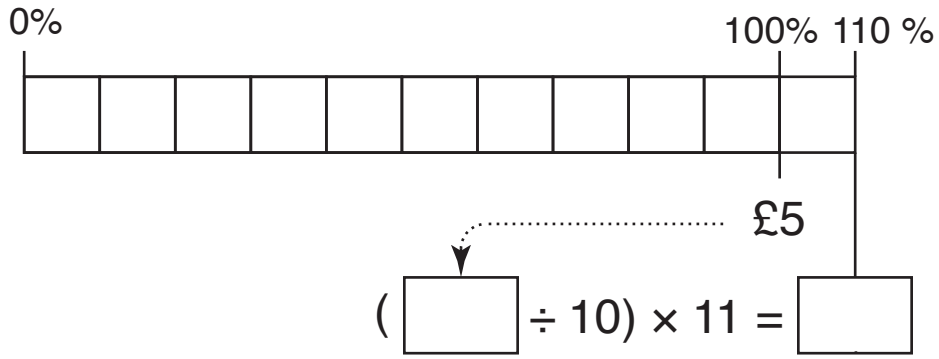
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1a Chris is a barber.

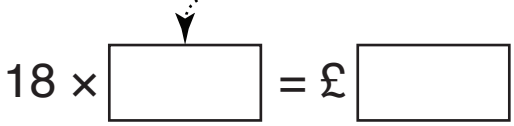


He charges £5 for a hair cut
He charges 10% extra for gel.

A customer has a hair cut and asks for gel.
Work out how much Chris charges them.



1b One day 18 customers have a hair cut and ask for gel.
Work out the total amount that Chris charges the 18 customers.



1c On the same day 32 customers have a hair cut but do **not** ask for gel.
Work out the total amount that Chris charges the 32 customers.

Answer _____

1d Work out the total amount that Chris charges his customers that day.

Answer _____

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15.4 Increase by a percentage next steps: Test

F/H

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1a Jim is a barber.

He charges £6 for a hair cut
He charges 10% extra for gel.

One day 54 customers have a hair cut.
14 of these ask for hair gel.



Work out the total amount that Jim charges his customers that day.

Answer _____

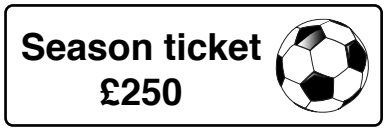
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15.5 Increase by a percentage advanced 1

F/H

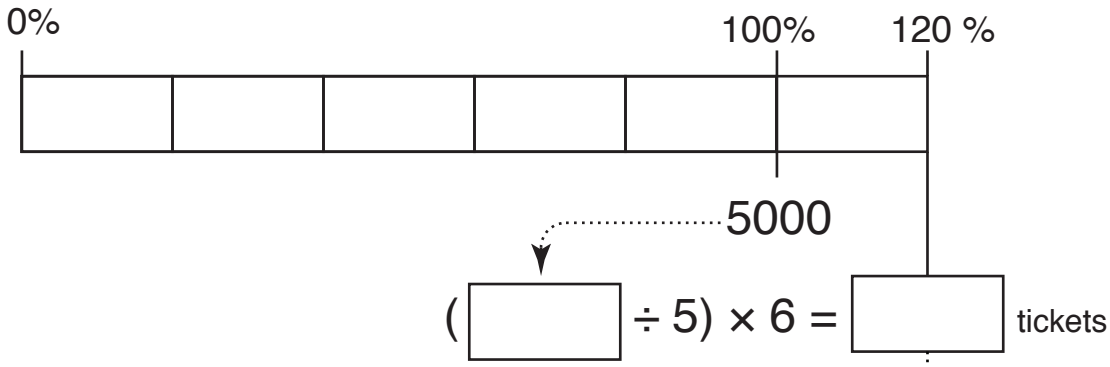
Licensed to The King's School, Devon

1a Last season a football club sold 5000 season tickets at £250 each.
Work out the total amount of money the football club received from season tickets.

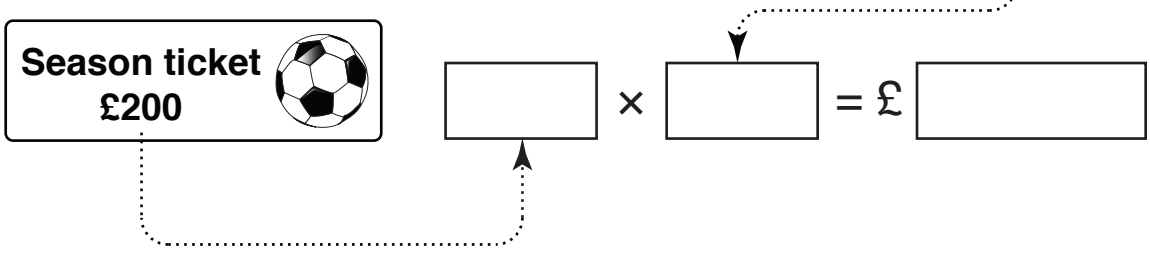


Answer _____

1b This season the season ticket price was reduced by 20% to £200.
The club sold 20% more tickets.
Increase 5000 by 20%



1c Work out the total amount of money the club received from season tickets this season.



1d Did the amount of money the club received from season tickets increase, decrease or stay the same?

☐ Increase ☐ Decrease ☐ Stay the same

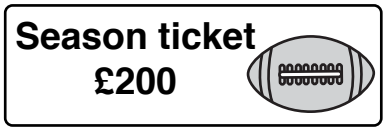
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15.5 Increase by a percentage advanced 2

F/H

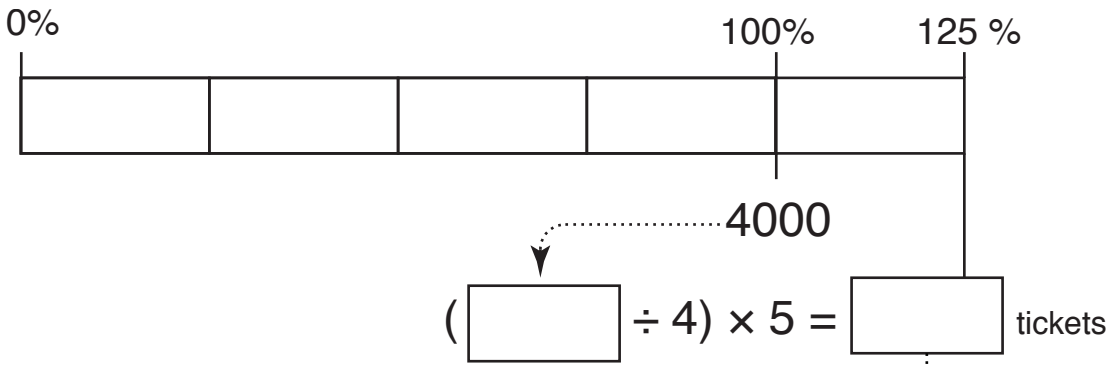
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1a Last season a rugby club sold 4000 season tickets at £200 each.
Work out the total amount of money the rugby club received from season tickets.

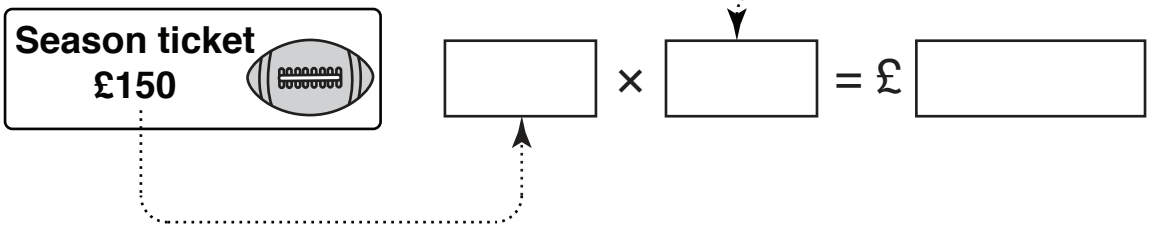


Answer _____

1b This season the season ticket price was reduced by 25% to £150.
The club sold 25% more tickets.
Increase 4000 by 25%



1c Work out the total amount of money the club received from season tickets this season.



1d Did the amount of money the club received from season tickets increase, decrease or stay the same?

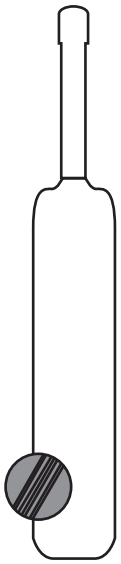
☐ Increase ☐ Decrease ☐ Stay the same

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15.5 Increase by a percentage advanced: Test

F/H

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1 Last season a cricket club sold 8000 season tickets at £250 each.

This season the season ticket price is reduced by 20% to £200.

If the club sells 20% **more** tickets will the amount of money they receive from season tickets increase, decrease, or stay the same?

You **must** show your working.

Answer _____

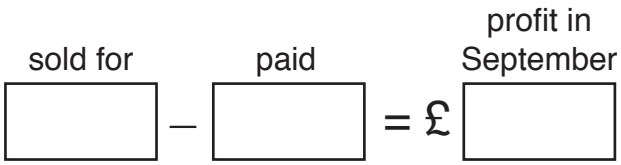
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15.6 Increase by a percentage extension 1

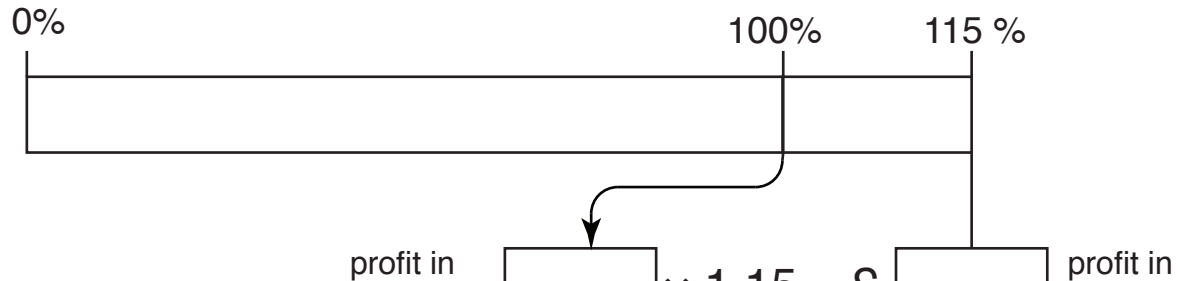
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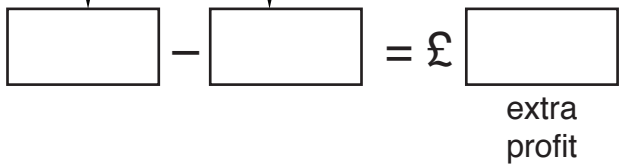
1a In September Andrew paid £560 for some books.
He sold all of the books for a total of £760.
Work out how much profit he made.



1b In October Andrew bought and sold some more books.
The profit he made was 15% greater than in September.
Calculate how much profit he made in October.



1c Calculate the **extra** profit he made in October.



1d In November Andrew wants to pay a bill of £30
He thinks the extra 15% profit he made in October will be enough to pay the bill.
Is Andrew correct?

☐ Yes

☐ No

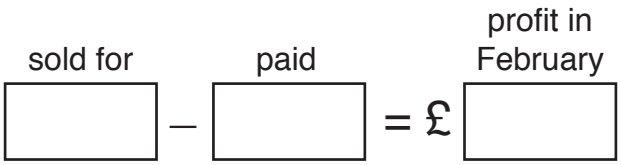
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15.6 Increase by a percentage extension 2

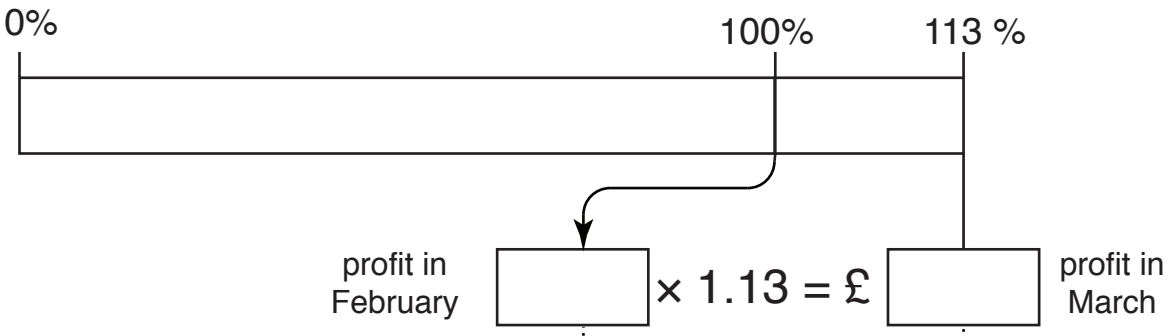
F/H

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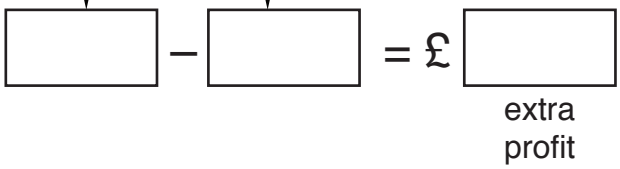
1a In February David paid £520 for some books.
He sold all of the books for a total of £640.
Work out how much profit he made.



1b In March David bought and sold some more books.
The profit he made was 13% greater than in February.
Calculate how much profit he made in March.



1c Calculate the **extra** profit he made in March.



1d In April David wants to pay a bill of £20
He thinks the extra 13% profit he made in March will be enough to pay the bill.
Is David correct?

☐ Yes

☐ No

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15.6 Increase by a percentage extension: Test

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1 In September James paid £450 for some books.
He sold all the books for a total of £590
In October he bought and sold some more books.
The total profit he made in October was 17% greater than in September.

In November James has to pay a bill of £20
He thinks that the 17% extra profit he made in October will be enough to pay this bill.

Is James correct?
You **must** show your working.

Answer _____

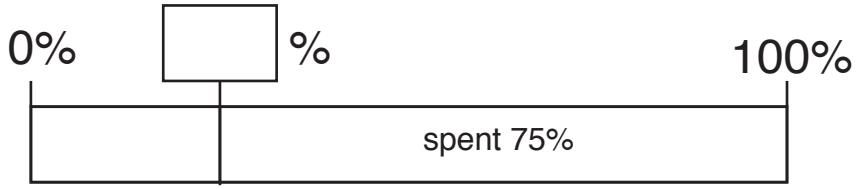
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15.7 Percentage of an amount 1

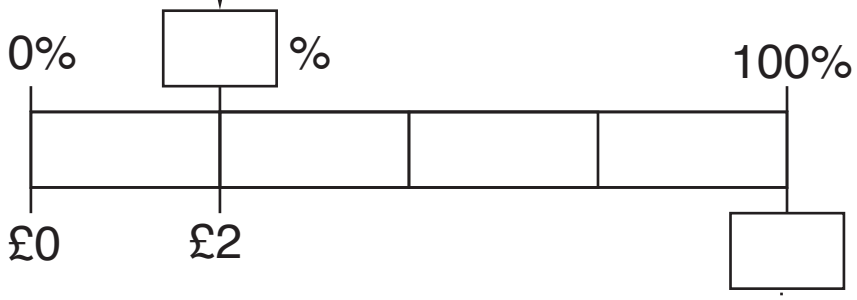
F/H

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1a Luke gets some pocket money.
He spends 75% of his pocket money.
Work out what percentage of his pocket money he has left.



1b Luke has £2 left.
Work out how much pocket money he got.



1c Joe has 40% of his pocket money left.
Write 40% as a decimal.

Answer _____

1d Joe got the same amount of pocket money as Luke.
Work out how much money he has left.



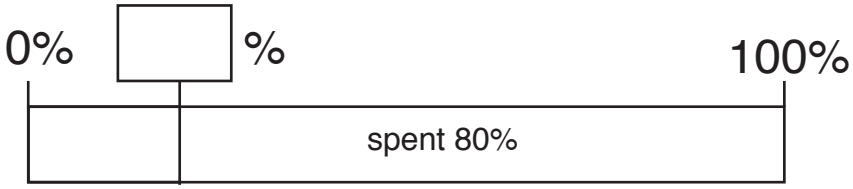
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15.7 Percentage of an amount 2

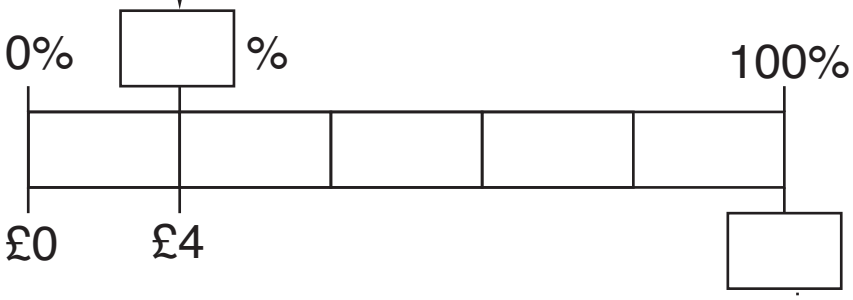
F/H

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1a Tim gets some pocket money.
He spends 80% of his pocket money.
Work out what percentage of his pocket money he has left.



1b Tim has £4 left.
Work out how much pocket money he got.



1c Andy has 30% of his pocket money left.
Write 30% as a decimal.

Answer _____

1d Andy got the same amount of pocket money as Tim.
Work out how much money he has left.



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15.7 Percentage of an amount: Test

F/H

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1 Sarah and Jane get the same amount of pocket money.
Sarah spends 80% of her pocket money.
She has £6 left.

Jane spends 60% of her pocket money.
How much does she have left?

Answer _____

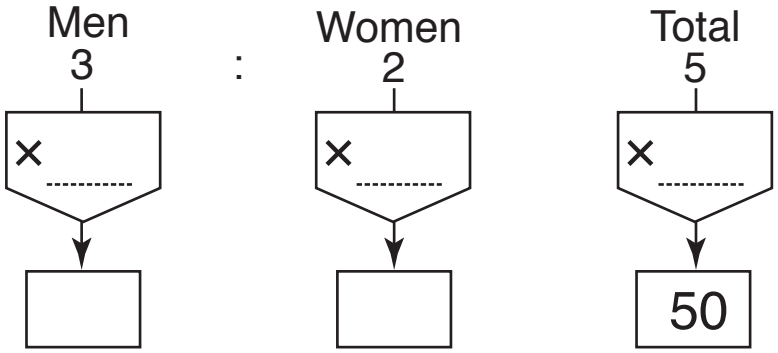
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15.8 Percentage and ratio introduction 1

F/H

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1a In a company the ratio of men to women is 3:2
The total number of people in the company is 50
Complete the diagram.



1b 40% of the men are under the age of 25
How many of the men are under the age of 25

men ☐ × 0.4 = ☐ under age 25

1c 10% of the women are under the age of 25
He many of the women are under the age of 25

women ☐ × 0.1 = ☐ under age 25

1d Calculate the total number of people in the company who are under the age of 25

☐ + ☐ = ☐

1e Calculate the percentage of people in the company who are under the age of 25

$$\frac{\text{Number under age 25}}{\text{Total number of people}} = \frac{\square}{50} \times 100 = \square\ \%$$

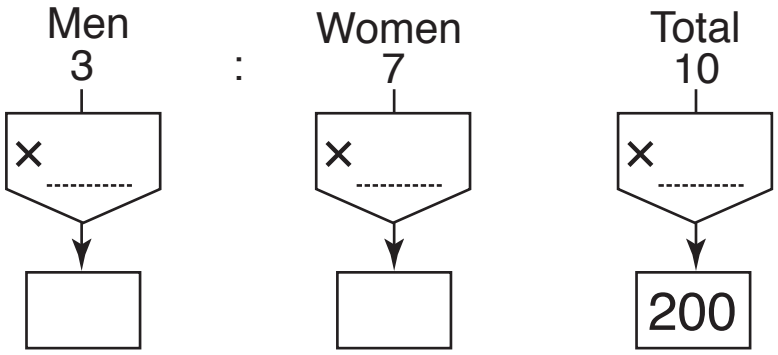
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15.8 Percentage and ratio introduction 2

F/H

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1a In a company the ratio of men to women is 3:7
The total number of people in the company is 200
Complete the diagram.



1b 30% of the men are under the age of 25
How many of the men are under the age of 25

men × 0.3 = under age 25

1c 20% of the women are under the age of 25
He many of the women are under the age of 25

women × 0.2 = under age 25

1d Calculate the total number of people in the company who are under the age of 25

____ + ____ = ____

1e Calculate the percentage of people in the company who are under the age of 25

$$\frac{\text{Number under age 25}}{\text{Total number of people}} = \frac{\square}{200} \times 100 = \square\ \%$$

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15.8 Percentage and ratio introduction: Test

F/H

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1 In a company the ratio of men to women is 3:2
The total number of people in the company is 200

30% of the men are under the age of 25

40% of the women are under the age of 25

What percentage of all the people in the company are under the age of 25?

Answer _____

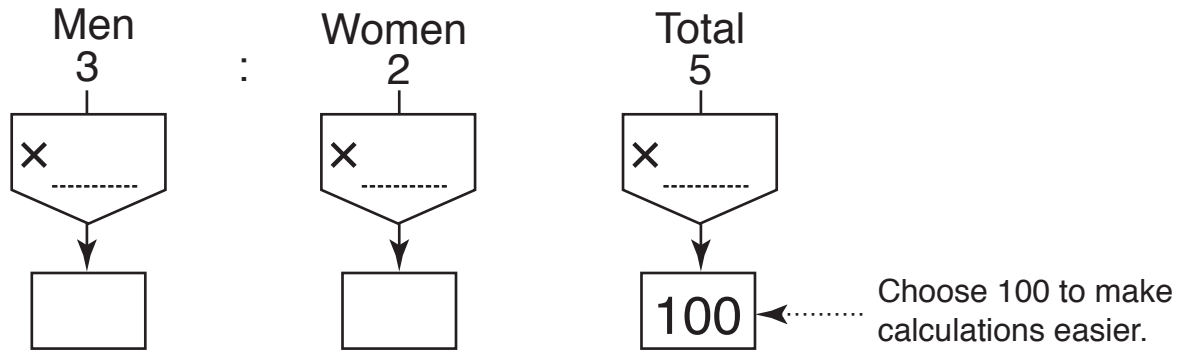
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15.9 Percentage and ratio next steps 1

F/H

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1a In a company the ratio of men to women is 3:2
Complete the diagram.



1b 30% of the men are under the age of 25
How many of the men are under the age of 25

men × 0.3 = under age 25

1c 40% of the women are under the age of 25
He many of the women are under the age of 25

women × 0.4 = under age 25

1d Calculate the total number of people in the company who are under the age of 25

____ + ____ = ____

1e Calculate the percentage of people in the company who are under the age of 25

$$\frac{\text{Number under age 25}}{\text{Total number of people}} \times 100 = ____\ \%$$

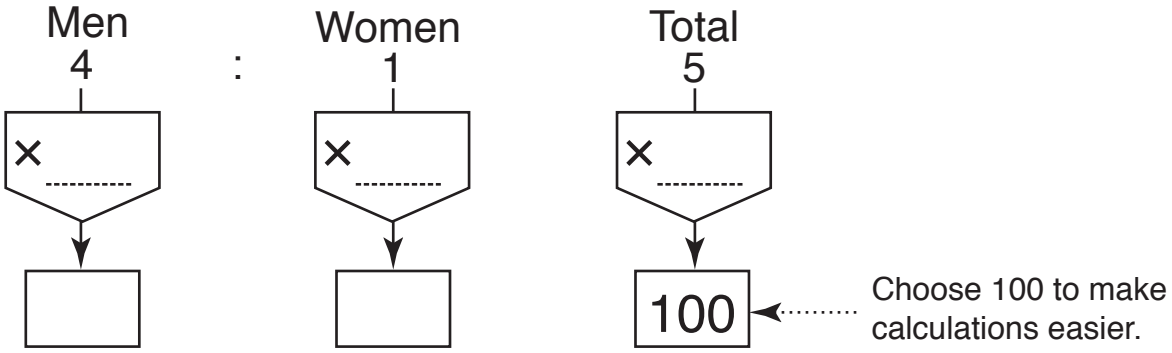
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15.9 Percentage and ratio next steps 2

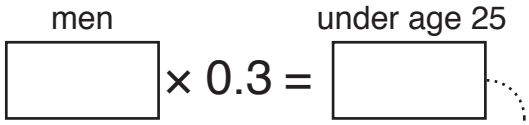
F/H

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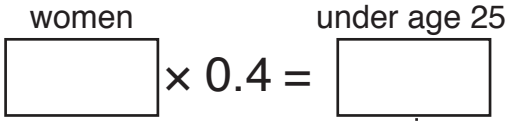
1a In a company the ratio of men to women is 4:1
Complete the diagram.



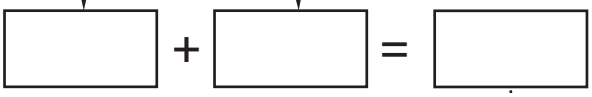
1b 30% of the men are under the age of 25
How many of the men are under the age of 25



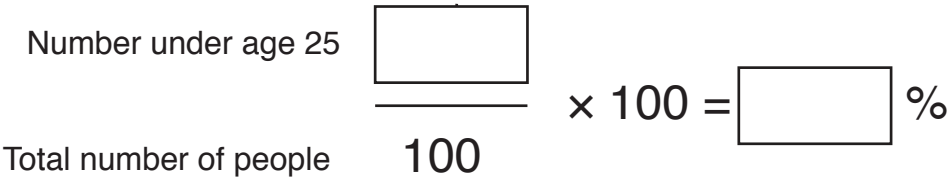
1c 40% of the women are under the age of 25
He many of the women are under the age of 25



1d Calculate the total number of people in the company who are under the age of 25



1e Calculate the percentage of people in the company who are under the age of 25



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15.9 Percentage and ratio next steps: Test

F/H

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1 In a company the ratio of men to women is 3:2

60% of the men are under the age of 25
20% of the women are under the age of 25

What percentage of all the people in the company are under the age of 25?

Answer _____

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15.10 Percentage and ratio advanced 1

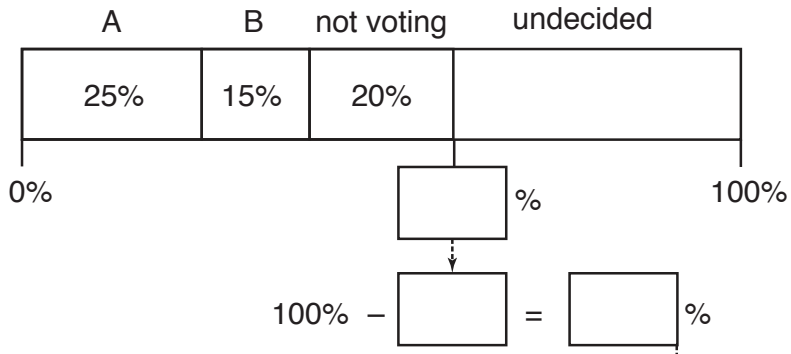
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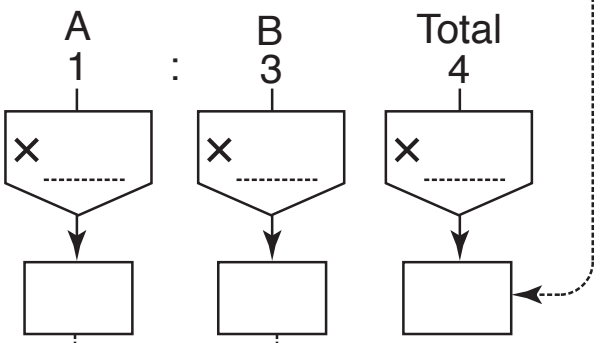
1a Before an election,

25% said they would vote for A
15% said they would vote for B
20% said they would not vote

Calculate what percentage of the population were undecided.



1b People who were undecided voted for A and B in the ratio 1: 3
Share the percentage of the population who were undecided in the ratio 1: 3



1c All of the other people voted as they said they would before the election.
Who got the most votes?

A 25 + ☐ = ☐ %

B 15 + ☐ = ☐ %

Tick your answer A ☐ B ☐

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15.10 Percentage and ratio advanced 2

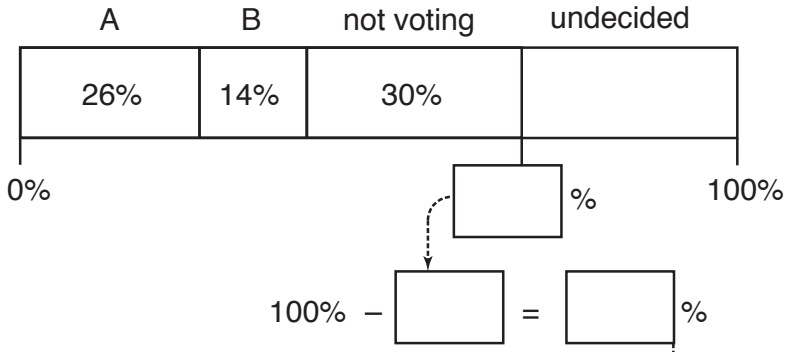
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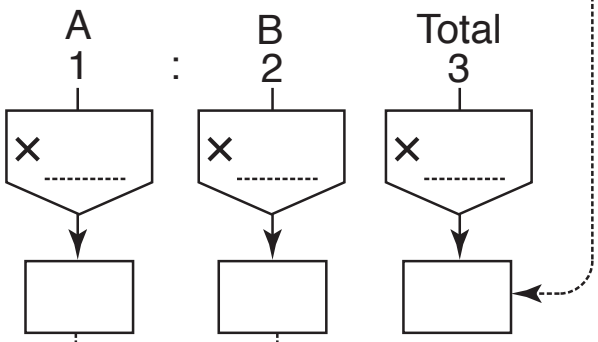
1a Before an election,

26% said they would vote for A
14% said they would vote for B
30% said they would not vote

Calculate what percentage of the population were undecided.



1b People who were undecided voted for A and B in the ratio 1: 2
Share the percentage of the population who were undecided in the ratio 1: 2



1c All of the other people voted as they said they would before the election.
Who got the most votes?

A 26 + ☐ = ☐ %

B 14 + ☐ = ☐ %

Tick your answer A ☐ B ☐

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15.10 Percentage and ratio advanced: Test

F/H

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1 Before an election,

26% said they would vote for A
14% said they would vote for B
20% said they would **not** vote

They all voted as they said.
The rest of the population voted for A and B in the ratio 1: 3

Who got the most votes?
You **must** show your working.

Answer _____

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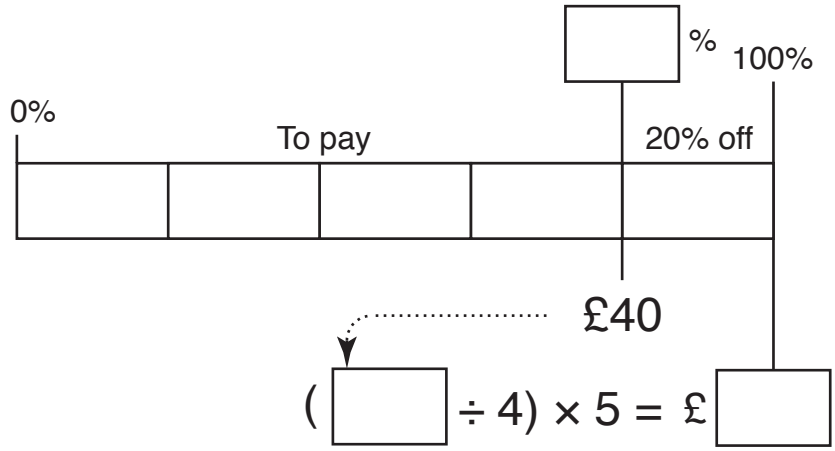
15.11 Reverse percentage introduction 1

F/H

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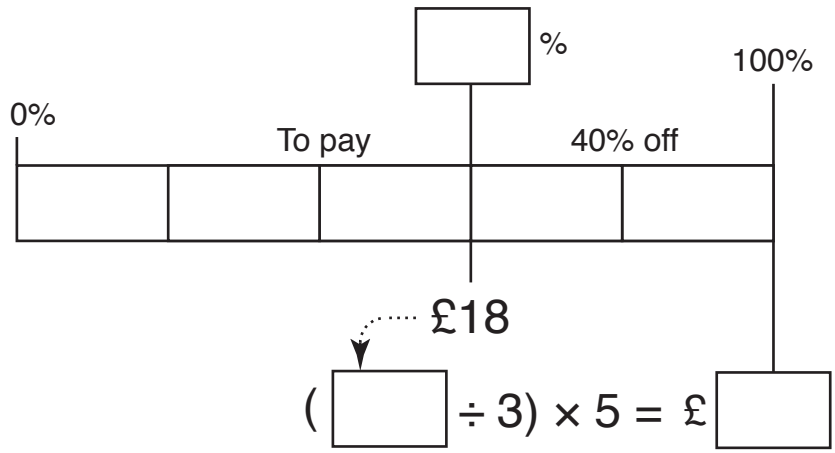
1 In a sale, the normal prices are reduced by 20%
A coat now costs £40
Work out the normal price of the coat.





2 In a sale, the normal prices are reduced by 40%
A pair of shoes now cost £18
Work out the normal price of the pair of shoes.





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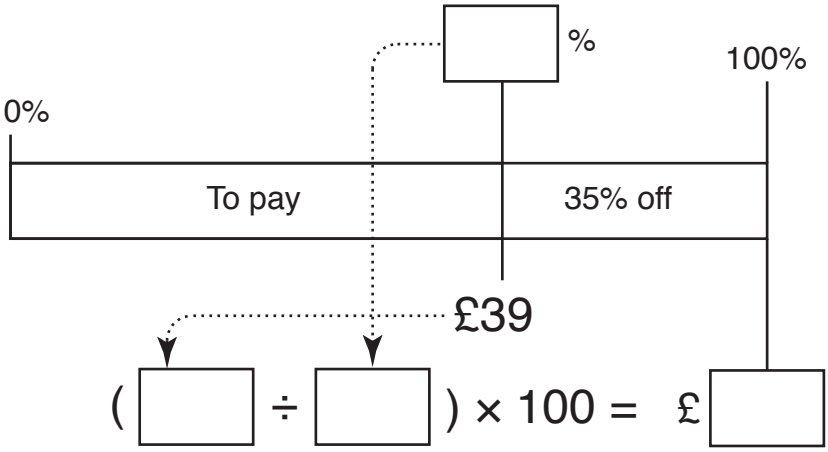
15.11 Reverse percentage introduction 2

F/H

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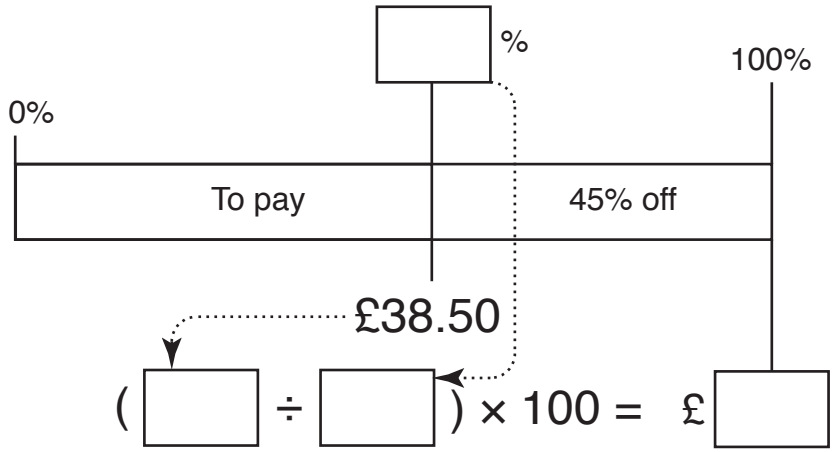
1 In a sale, the normal prices are reduced by 35%
A pair of boots now cost £39
Work out the normal price of the pair of boots.





2 In a sale, the normal prices are reduced by 45%
A pair of shoes now cost £38.50
Work out the normal price of the pair of shoes.





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15.11 Reverse percentage: Test

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1 In a sale, the normal prices are reduced by 20%
A pair of shoes cost £32
Work out the normal price of the pair of shoes.



Answer _____

2 In a sale, the normal prices are reduced by 35%
A pair of shoes cost £58.50
Work out the normal price of the pair of shoes.



Answer _____

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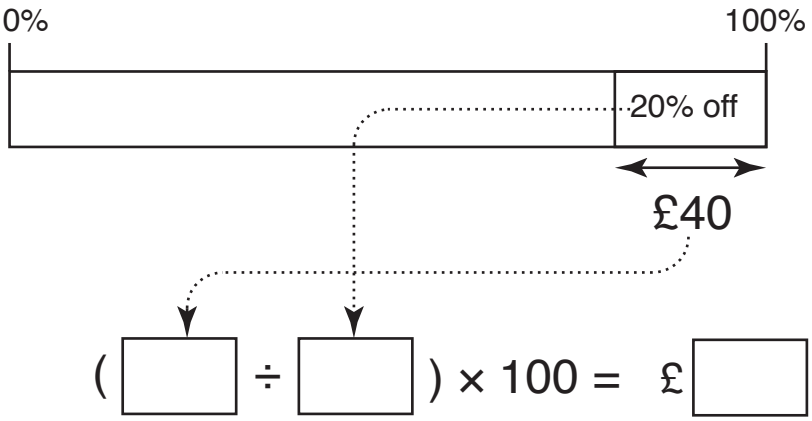
15.12 Reverse percentage advanced 1

F/H

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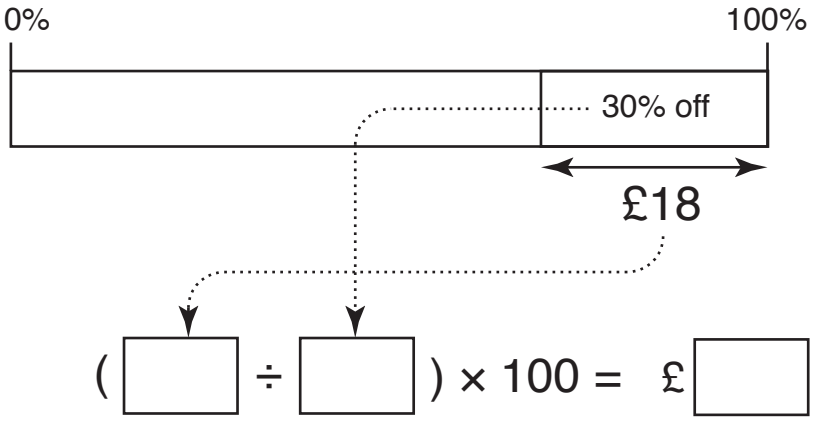
1 In a sale, the normal prices are reduced by 20%
The normal price of a jacket is reduced by £40
Work out the normal price of the jacket.





2 In a sale, the normal prices are reduced by 30%
The normal price of a jacket is reduced by £18
Work out the normal price of the jacket.





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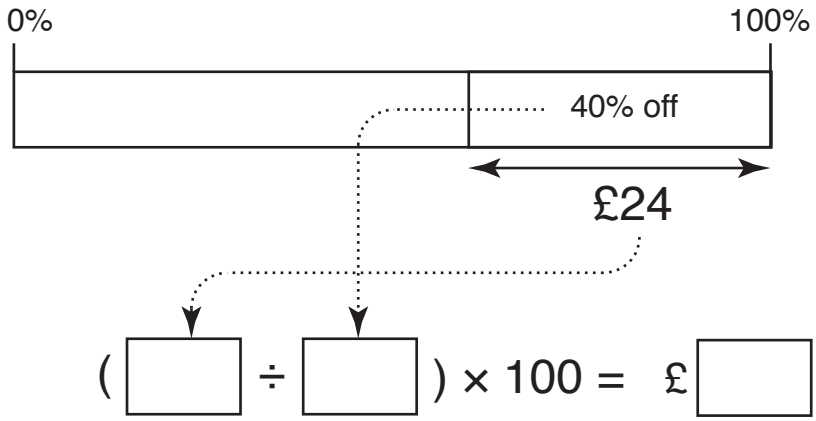
15.12 Reverse percentage advanced 2

F/H

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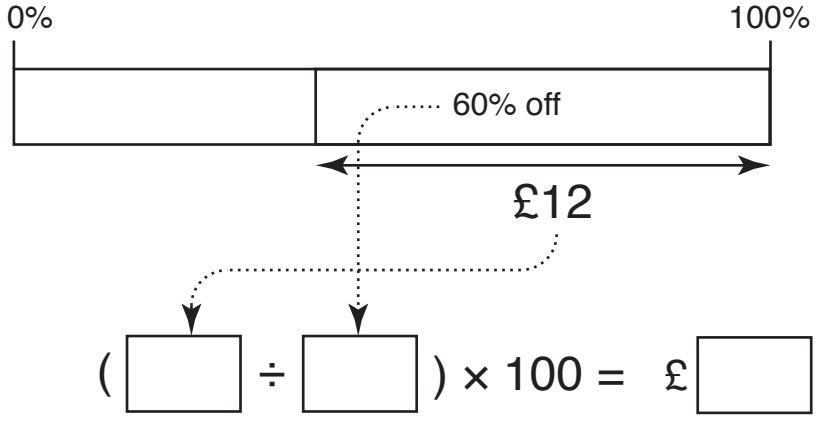
1 In a sale, the normal prices are reduced by 40%
The normal price of a shirt is reduced by £24
Work out the normal price of the shirt.





2 In a sale, the normal prices are reduced by 60%
The normal price of a jacket is reduced by £12
Work out the normal price of the jacket.





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15.12 Reverse percentage advanced: Test

F/H

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1 In a sale, the normal prices are reduced by 20%
The normal price of a skirt is reduced by £8
Work out the normal price of the skirt.



20% off
Reduced by £8

Answer _____

2 In a sale, the normal prices are reduced by 30%
The normal price of a dress is reduced by £12
Work out the normal price of the dress.



30% off
Reduced by £12

Answer _____

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16 Fractions

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16.1	Fraction of an amount introduction	647
16.2	Fraction of an amount next steps	651
16.3	Fraction of an amount advanced	655
16.4	Fractions, percentages, profit	659
16.5	Fractions & profit introduction	663
16.6	Fractions & profit next steps	667
16.7	Fractions & profit advanced	671
16.8	Fractions & ratio	675
16.9	Fractions of a shape introduction	679
16.10	Fractions of a shape advanced	683

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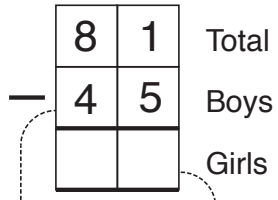
16.1 Fraction of an amount introduction 1

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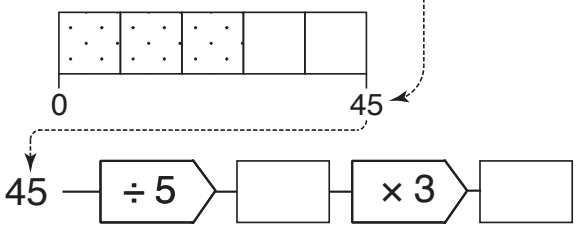
1 There are **81** pupils at a school.
45 of the pupils are **boys**.

1a Calculate how many of the pupils are **girls**.



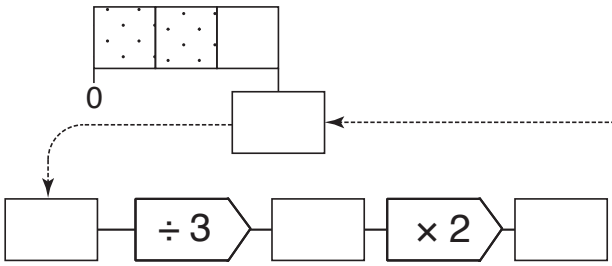
1b $\frac{3}{5}$ of the boys walk to school.

Work out how many **boys walk** to school.



1c $\frac{2}{3}$ of the girls walk to school.

Work out how many **girls walk** to school.



1d Work out how many pupils walk to school.

Answer _____

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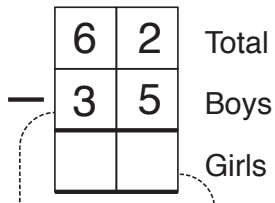
16.1 Fraction of an amount introduction 2

F/H

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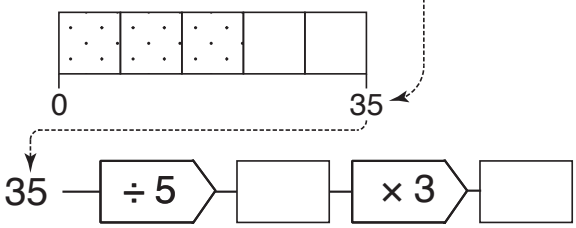
1 There are **62** pupils at a school.
35 of the pupils are **boys**.

1a Calculate how many of the pupils are **girls**.



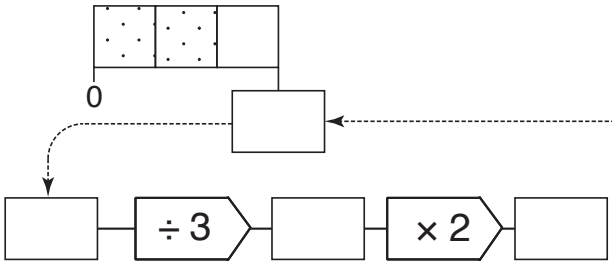
1b $\frac{3}{5}$ of the boys walk to school.

Work out how many **boys walk** to school.



1c $\frac{2}{3}$ of the girls walk to school.

Work out how many **girls walk** to school.



1d Work out how many pupils walk to school.

Answer _____

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16.1 Fraction of an amount introduction: Test

F/H

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1 There are **58** pupils at a school.
25 of the pupils are boys.

$\frac{3}{5}$ of the boys travel by bus to school.

$\frac{2}{3}$ of the girls travel by bus to school.

Work out **how many** pupils **travel by bus** to school.

Answer _____

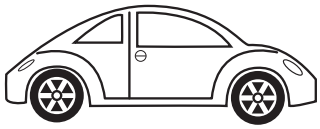
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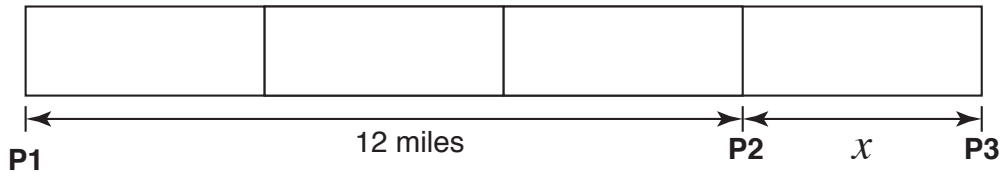
16.2 Fraction of an amount next steps 1

F/H

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1 P1, P2 and P3 are three points on the map.
The distance from **P1** to **P2** is is **12 miles**.

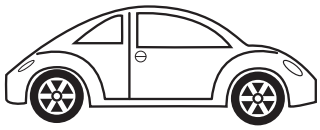


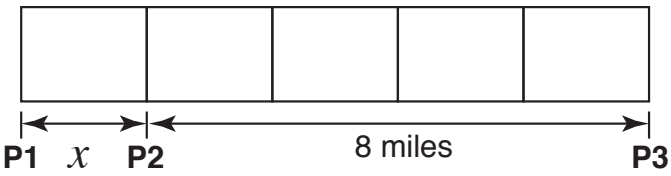


1 a The distance from **P2** to **P3** is **one-third** of the distance from **P1** to **P2**.
Work out the distance x from **P2** to **P3**.

Answer _____

2 P1, P2 and P3 are three points on the map.
The distance from **P1** to **P3** is is **12 miles**.





2 a The distance from **P1** to **P2** is **one-quarter** of the distance from **P2** to **P3**.
Work out the distance x from **P1** to **P2**.

Answer _____

2 b Work out the distance from **P1** to **P3**.

Answer _____

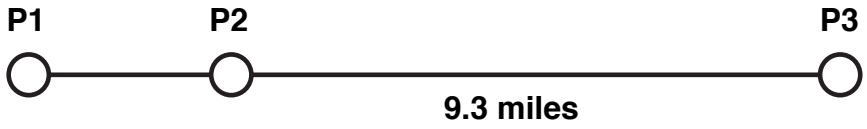
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16.2 Fraction of an amount next steps 2

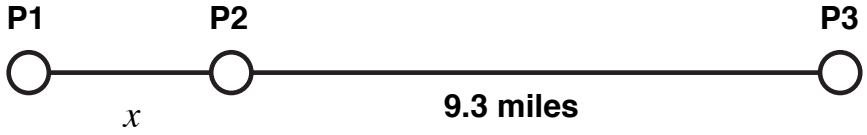
F/H

Licensed to The King's School, Devon

1 P1, P2 and P3 are three points on the map.
The distance from **P2** to **P3** is is **9.3 miles**.



1 a The distance from P1 to P2 is **one-third** of the distance from P2 to P3**.**
Calculate x.



Answer _____

1 b Work out the distance from P1 to P3.

Answer _____

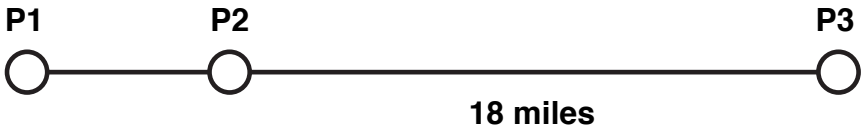
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16.2 Fraction of an amount next steps: Test

F/H

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1 P1, P2 and P3 are three points on the map.
The distance from **P2** to **P3** is **18 miles**.



The distance from **P1** to **P2** is **one-third** of the distance from **P2** to **P3**.

Work out the distance from **P1** to **P3**.

Answer _____

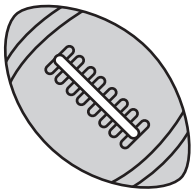
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16.3 Fraction of an amount advanced 1

F/H

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1a At a rugby match
3582 of the people are men.
1750 of the people are women.
Calculate the total number of men and women



	3	5	8	2	Men
+	1	7	5	0	Women
					Total men and women

1b There are 6580 people at the rugby match.
Calculate how many are children.

	6	5	8	0	Total people
−					Total men and women
					Total children

1c $\frac{1}{4}$ of the children are girls.
How many girls are at the rugby match?



					Number of girls
4					

1d How many boys are at the rugby match?

−					
					Number of boys

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16.3 Fraction of an amount advanced 2

F/H

Licensed to The King's School, Devon

1a At a football match
4120 of the people are men.
2023 of the people are women.
Calculate the total number of men and women

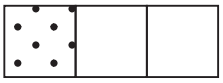


	4	1	2	0	Men
+	2	0	2	3	Women
					Total men and women

1b There are 8579 people at the football match.
Calculate how many are children.

	8	5	7	9	Total people
−					Total men and women
					Total children

1c $\frac{1}{3}$ of the children are girls.
How many girls are at the football match?



					Number of girls
3					

1d How many boys are at the rugby match?

−					
					Number of boys

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16.3 Fraction of an amount advanced: Test

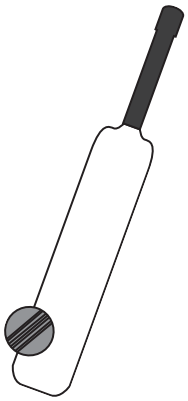
F/H

Licensed to The King's School, Devon

1 There are 5629 people at a cricket match.
2112 of them are men.
2104 of them are women.

$\frac{1}{3}$ of the children are girls.

Work out how many boys are at the cricket match.



Answer _____

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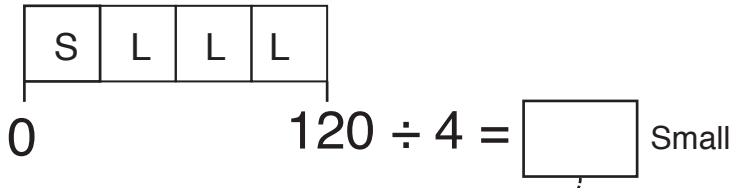
16.4 Fractions , percentages, profit 1

F/H

Licensed to The King's School, Devon

1a Amy sold 120 hot chocolates.
One quarter of the hot chocolates were small.
The rest were large.
Calculate how many hot chocolates were small.





1b Calculate how many hot chocolates were large.

120 – ☐ = ☐ Large

1c On each small hot chocolate, Amy makes a profit of £2
Work out her total profit on small hot chocolates.

☐ × £2 = £☐ Profit (Small Hot Chocolates)

Small

1d Amy makes 10% more profit for each large hot chocolate.
Work out her profit on a large hot chocolate.

£2 × 1.10 = £☐

1e Work out her total profit on large hot chocolates.

☐ × ☐ = £☐ Profit (Large Hot Chocolates)

Large

1f Work out the total profit that Amy makes.

Answer _____

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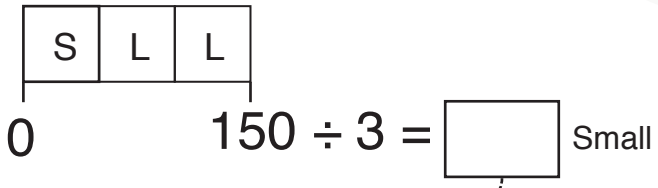
16.4 Fractions , percentages, profit 2

F/H

Licensed to The King's School, Devon

1a Amy sold 150 cappuccinos.
One third of the cappuccinos were small.
The rest were large.
Calculate how many cappuccinos were small.





1b Calculate how many cappuccinos were large.

150 − ☐ = ☐ Large

1c On each small cappuccino, Amy makes a profit of £2.50
Work out her total profit on small cappuccinos.

☐ × £2.50 = £☐ Profit (Small Cappuccions)

Small

1d Amy makes 20% more profit for a each large cappuccino.
Work out her profit on a large cappuccino.

£2.50 × 1.20 = £☐

1e Work out her total profit on large cappuccino.

☐ × ☐ = £☐ Profit (Large Cappuccions)

Large

1f Work out the total profit that Amy makes.

Answer _____

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16.4 Fractions , percentages, profit: Test

F/H

Licensed to The King's School, Devon

1 Amy sold 80 caffè lattes.
One quarter of the caffè lattes were small.
The rest were large.
Amy made a profit of £1.50 on each small caffè latte.
She made 30% more profit on each large caffè latte.
Work out her total profit.



Answer _____

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16.5 Fractions and profit introduction 1

F/H

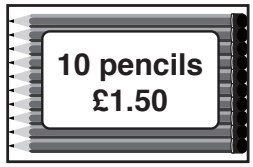
Licensed to The King's School, Devon

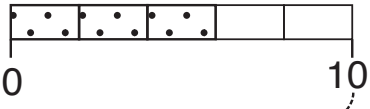
1a Damien buys a pack of 10 pencils for £1.50

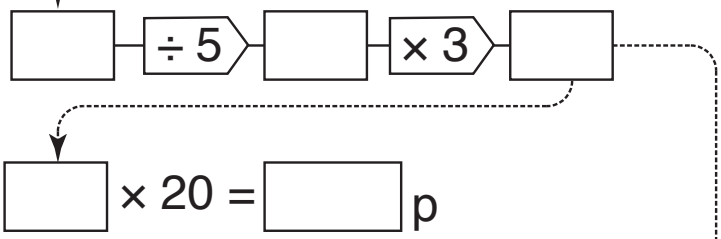
Damien sells $\frac{3}{5}$ of the 10 pencils he bought.

He sells each of these pencils for 20p.

Calculate how much money he receives.

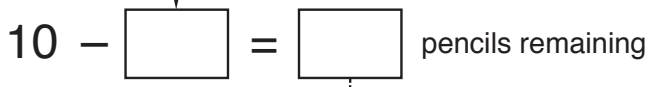






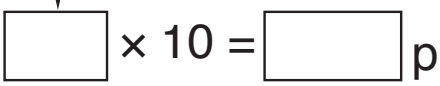


1b How many pencils does Damien have remaining?



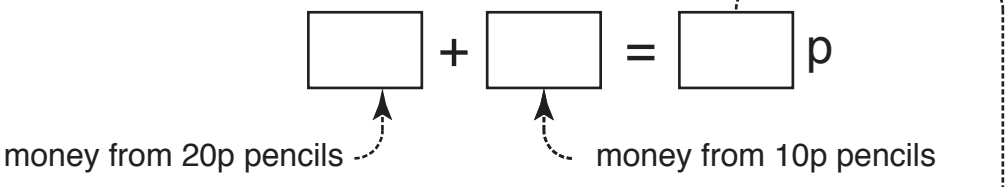
1c Damien sells each of the remaining pencils for 10p each.

Calculate how much money he receives.

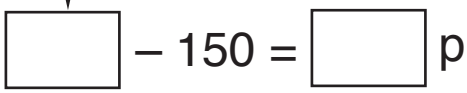




1d Calculate the total amount of money Damien receives.



1e Calculate the profit that Damien makes.



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16.5 Fractions and profit introduction 2

F/H

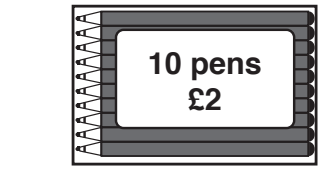
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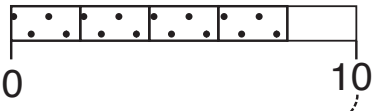
1a Damien buys a pack of 10 pens for £2

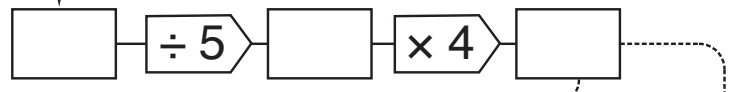
Damien sells $\frac{4}{5}$ of the 10 pens he bought.

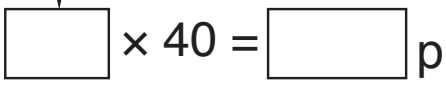
He sells each of these pens for 40p.

Calculate how much money he receives.



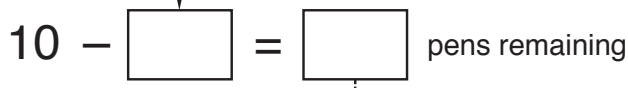






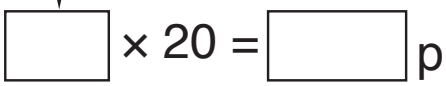


1b How many pens does Damien have remaining?



1c Damien sells each of the remaining pens for 20p each.

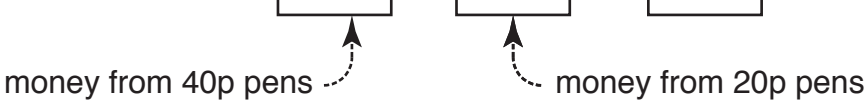
Calculate how much money he receives.



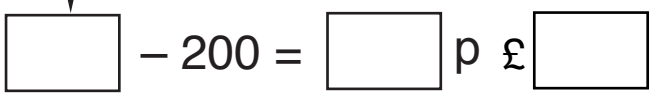


1d Calculate the total amount of money Damien receives.





1e Calculate the profit that Damien makes.



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16.5 Fractions and profit introduction: Test

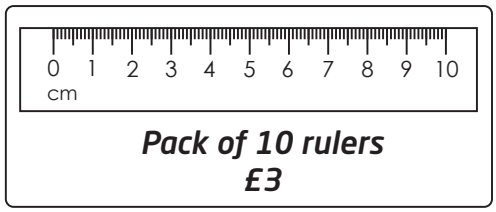
F/H

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1 Damien buys a pack of 10 rulers for £3.

Damien sells $\frac{2}{5}$ of the 10 rulers he bought.

He sells each of these rulers for 50p.
He sells the remaining rulers for 40p each.
Calculate the total profit he makes.



Answer _____

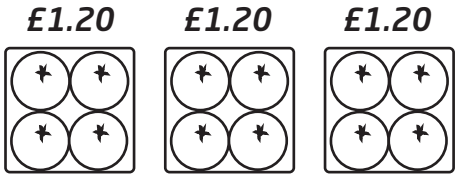
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16.6 Fractions and profit next steps 1

F/H

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1 Andrew buys 3 bags of oranges.
There are 4 oranges in each bag.
Each bag of oranges costs £1.20



1a How much in total did Andrew pay?

□ × □ = £ □

1b How many oranges did Andrew buy?

□ × □ = □

1c Andrew sells $\frac{5}{6}$ of the oranges.

□ ÷ 6 □ × 5 □

He sells each of these oranges for 60p.
Calculate how much money he receives.

□ × 60 = □ p

1d How many oranges does Andrew have remaining?

□ − □ = □

1e Andrew sells the remaining oranges for 50p each.
Calculate how much money he receives.

□ × 50 = □ p

1f Calculate the total amount of money Andrew receives.

□ + □ = □ p

money from 60p oranges

money from 50p oranges

1g Calculate the profit that Andrew makes.

□ − □ = □ p

total Andrew paid for oranges

£ □

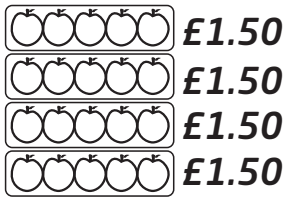
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16.6 Fractions and profit next steps 2

F/H

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1 Andrew buys 4 bags of apples.
There are 5 apples in each bag.
Each bag of apples costs £1.50



1a How much in total did Andrew pay?

□ × □ = £ □

1b How many apples did Andrew buy?

□ × □ = □

1c Andrew sells $\frac{4}{5}$ of the apples.

□ ÷ 5 □ × 4 □

He sells each of these apples for 50p.
Calculate how much money he receives.

□ × 50 = □ p

1d How many apples does Andrew have remaining?

□ − □ = □

1e Andrew sells the remaining apples for 40p each.
Calculate how much money he receives.

□ × 40 = □ p

1f Calculate the total amount of money Andrew receives.

□ + □ = □ p

money from 50p apples — money from 40p apples

1g Calculate the profit that Andrew makes.

□ − □ = □ p

total Andrew paid for apples — £ □

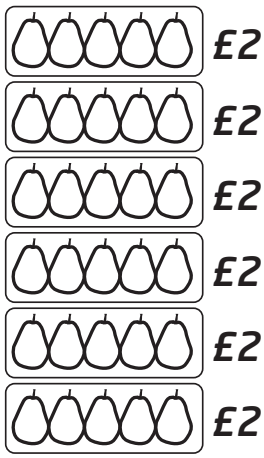
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16.6 Fractions and profit next steps: Test

F/H

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1 Andrew buys 6 boxes of pears.
There are 5 pears in each box.
Each box of pears costs £2



Andrew sells $\frac{3}{5}$ of the pears he bought.

He sells each of these pears for 60p.
He sells each of the remaining pears for 30p each.
Calculate the total profit he makes.

Answer _____

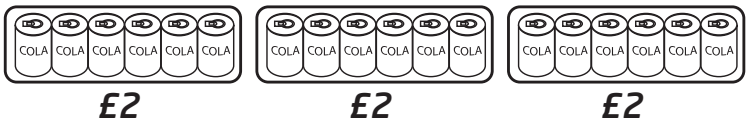
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16.7 Fractions and profit advanced 1

F/H

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1 Saffron buys 3 packs of cola.
There are 6 cans in each pack.
Each pack of cola costs £2



1a How much in total did Saffron pay?

□ × □ = £ □

1b How many cans did Saffron buy?

□ × □ = □

1c Saffron sells $\frac{5}{9}$ of the cans.

□ ÷ 9 □ × 5 □

She sells each of these cans for 80p.
Calculate how much money she receives.

□ × 80 = □ p

1d How many cans does Saffron have remaining?

□ − □ = □

1e Saffron sells the remaining cans at 2 for 50p.
Calculate how much money she receives.

(□ ÷ 2) × 50 = □ p

1f Calculate the total amount of money Saffron receives.

□ + □ = □ p

money from 80p cans

money from 2 for 50p cans

1g Calculate the profit that Saffron makes.

□ − □ = □ p

total Saffron paid for cans of cola

£ □

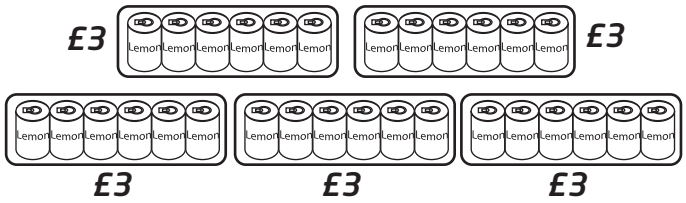
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16.7 Fractions and profit advanced 2

F/H

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1 Saffron buys 5 packs of lemonade.
There are 6 cans in each pack.
Each pack of lemonade costs £3



1a How much in total did Saffron pay?

$\square \times \square = £\square$

1b How many cans did Saffron buy?

$\square \times \square = \square$

1c Saffron sells $\frac{4}{5}$ of the cans.

$\square \div 5 \rightarrow \square \times 4 \rightarrow \square$

She sells each of these cans for 90p.
Calculate how much money she receives.

$\square \times 90 = \square$ p

1d How many cans does Saffron have remaining?

$\square - \square = \square$

1e Saffron sells the remaining cans at 3 for 60p.
Calculate how much money she receives.

$(\square \div 3) \times 60 = \square$ p

1f Calculate the total amount of money Saffron receives.

$\square + \square = \square$ p

money from 90p cans

money from 3 for 60p cans

1g Calculate the profit that Saffron makes.

$\square - \square = \square$ p

£ $\square$

total Saffron paid for cans of lemonade

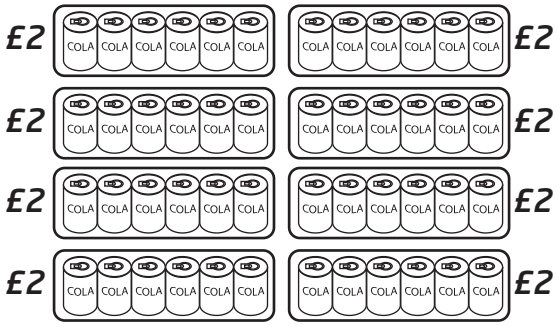
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16.7 Fractions and profit advanced: Test

F/H

Licensed to The King's School, Devon

1 Saffron buys 8 packs of cola.
There are 6 cans in each pack.
Each pack of cola costs £2



Saffron sells $\frac{2}{3}$ of the cans she bought.

Saffron sells each of these cans of cola for 90p.
Saffron sells the remaining cans of cola at 4 for 60p
Calculate the total profit she makes.

Answer _____

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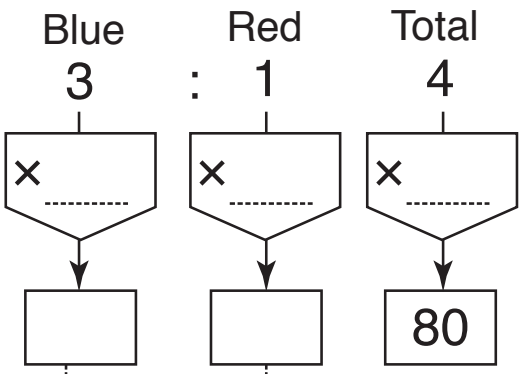
16.8 Fractions and ratio 1

F/H

Licensed to The King's School, Devon

1a Holly has 80 mugs to sell.

Each mug is either blue or red.
The ratio of the number of blue mugs to the number of red mugs is 3:1



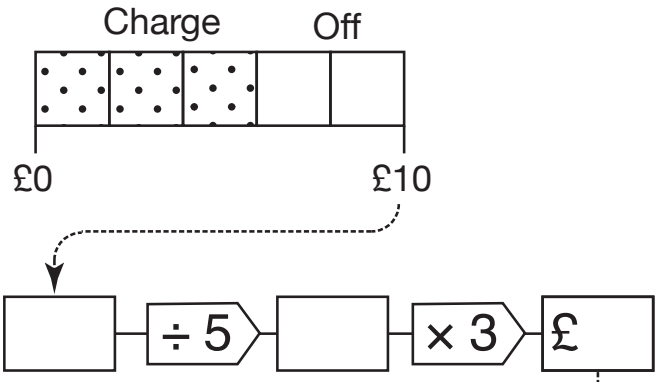
Calculate how many of the mugs are blue and how many are red.

1b Each mug has a normal price of £10
Holly reduces the price of all the blue mugs.

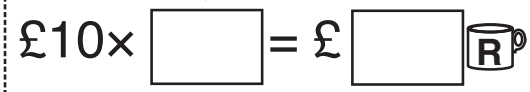
Blue Mugs

$\frac{2}{5}$ off the normal price

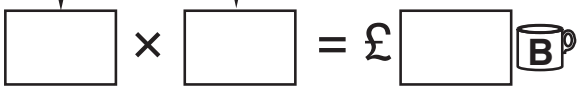
How much does Holly charge for blue mugs?



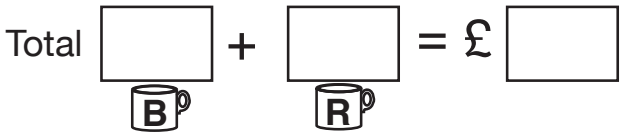
1c Holly sells all 80 mugs.
How much money does she receive from selling red mugs?



1d How much money does she receive from selling blue mugs?



1e Work out the total amount of money Holly will receive.



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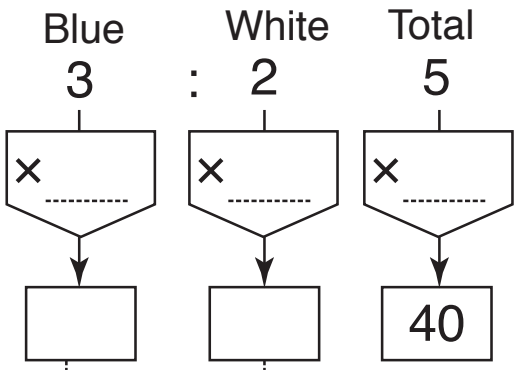
16.8 Fractions and ratio 2

F/H

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1a Joe has 40 shirts to sell.

Each shirt is either blue or white.
The ratio of the number of blue shirts to the number of white shirts is 3:2



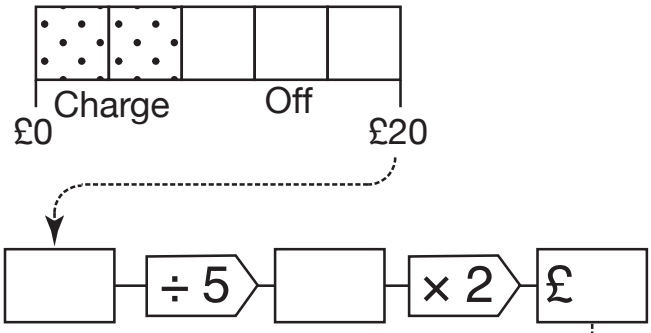
Calculate how many of the shirts are blue and how many are white.

1b Each shirt has a normal price of £20
Joe reduces the price of all the blue shirts.

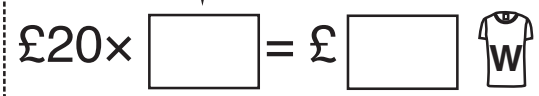
Blue Shirt

$\frac{3}{5}$ off the normal price

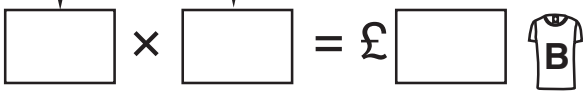
How much does Joe charge for blue shirts?



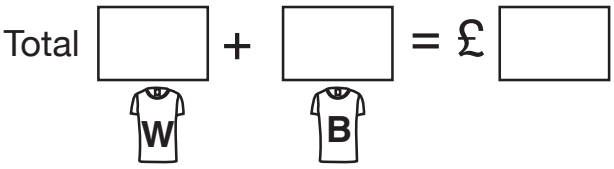
1c Joe sells all 40 shirts.
How much money does he receive from selling white shirts?



1d How much money does he receive from selling blue shirts?



1e Work out the total amount of money Joe will receive.



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16.8 Fractions and ratio: Test

F/H

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1 Emily has 30 dresses to sell.
Each dress is either red or blue.
The ratio of red dresses to blue dresses is 4:1

Each dress has a normal price of £40
Emily reduces the price of all the blue dresses.

Blue Dresses



$\frac{2}{5}$ off the normal price of £40

Emily sells all 30 dresses.
Work out the total amount of money Emily will receive.

Answer _____

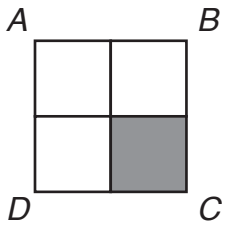
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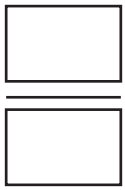
16.9 Fractions of a shape introduction 1

F/H

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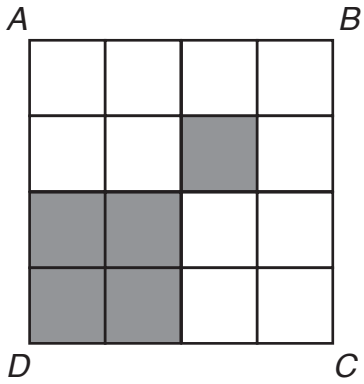
1 *ABCD* is a square. This diagram is drawn accurately.

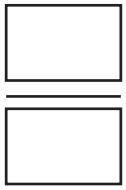




What fraction of the square is shaded?

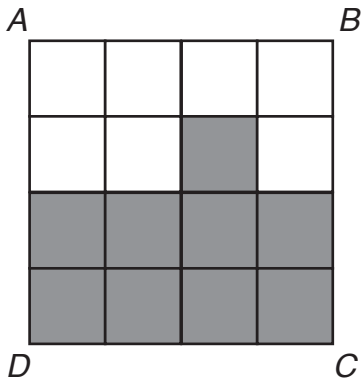
2 *ABCD* is a square. This diagram is drawn accurately.

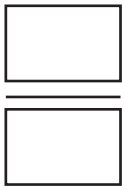




What fraction of the square is shaded?

3 *ABCD* is a square. This diagram is drawn accurately.





What fraction of the square is shaded?

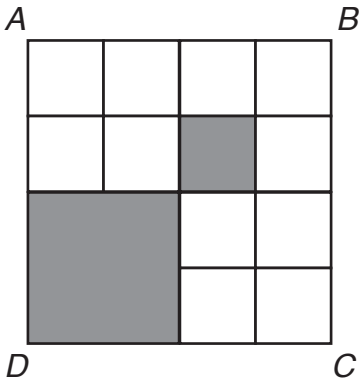
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16.9 Fractions of a shape introduction 2

F/H

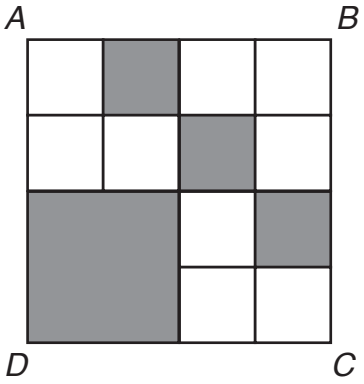
Licensed to The King's School, Devon

1 *ABCD* is a square. This diagram is drawn accurately.



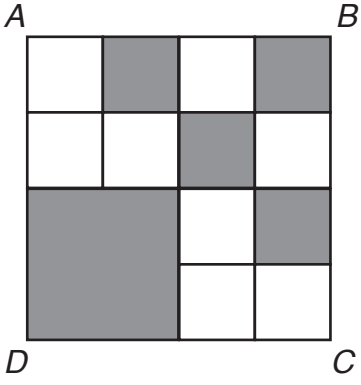
What fraction of the square is shaded?

2 *ABCD* is a square. This diagram is drawn accurately.



What fraction of the square is shaded?

3 *ABCD* is a square. This diagram is drawn accurately.



What fraction of the square is shaded? Give your answer in simplest form.

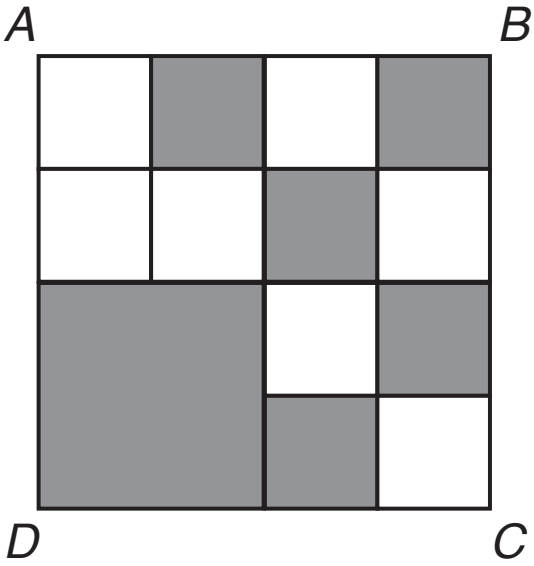
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16.9 Fractions of a shape introduction: Test

F/H

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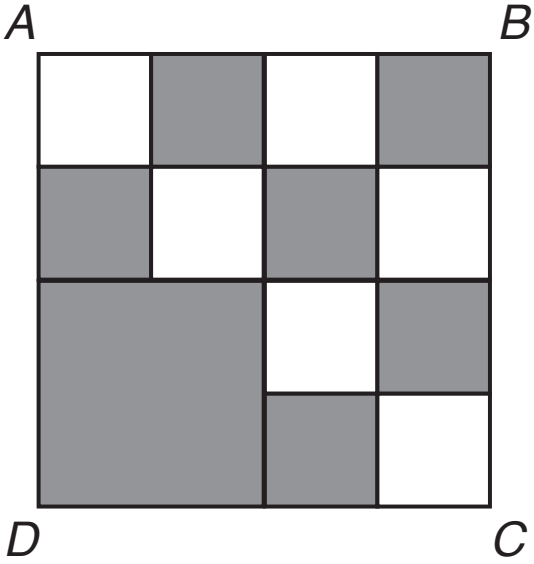
1 *ABCD* is a square.
This diagram is drawn accurately.



What fraction of the square is shaded?

$\frac{\square}{\square}$

2 *ABCD* is a square. This diagram is drawn accurately.



What fraction of the square is shaded?
Give your answer in simplest form.

$\frac{\square}{\square} = \frac{\square}{\square}$

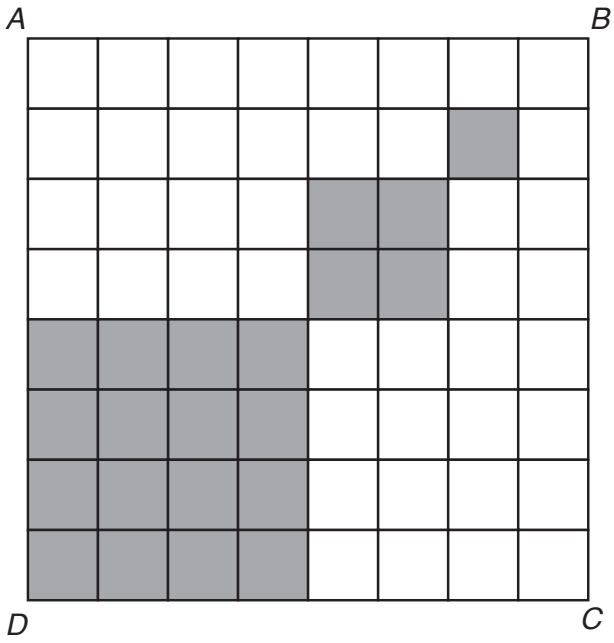
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16.10 Fractions of a shape advanced 1

F/H

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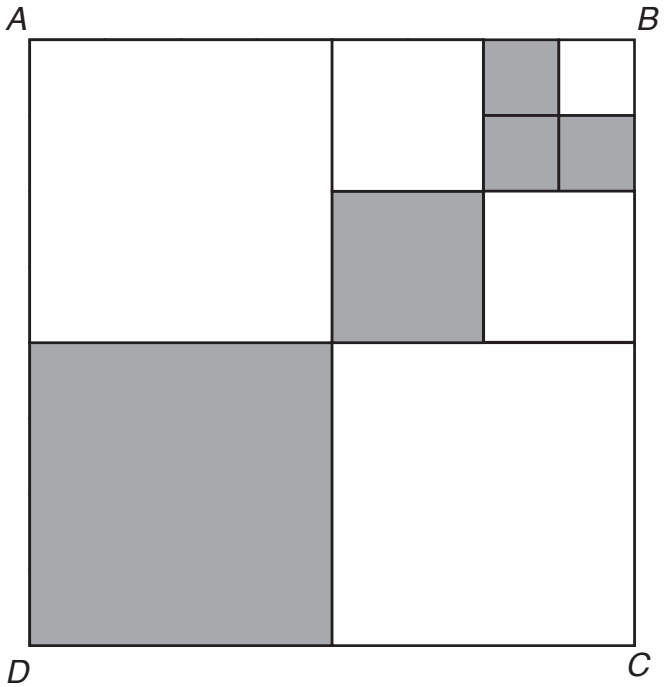
1 *ABCD* is a square.
This diagram is drawn accurately.



What fraction of the square is shaded?

$\frac{\square}{\square}$

2 *ABCD* is a square.
This diagram is drawn accurately.



What fraction of the square is shaded?

$\frac{\square}{\square}$

What fraction of the square is shaded?

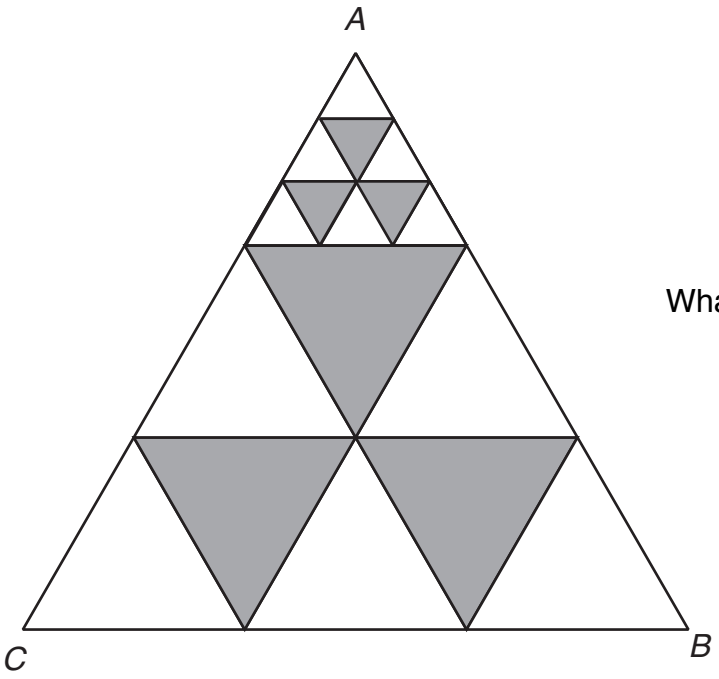
© Toticity Limited

16.10 Fractions of a shape advanced 2

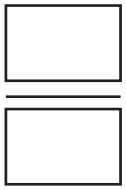
F/H

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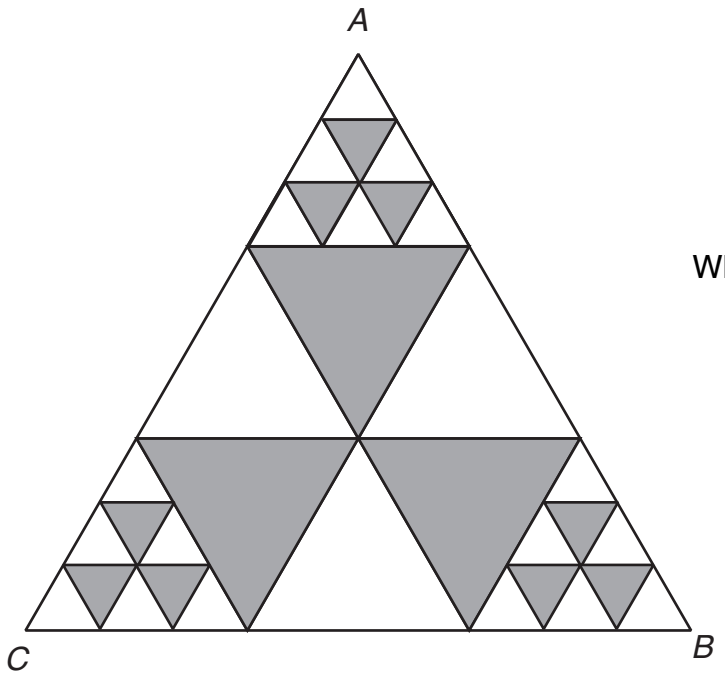
1 *ABC* is an equilateral triangle.
This diagram is drawn accurately.



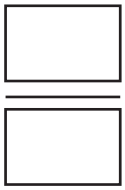
What fraction of the triangle is shaded?



2 *ABC* is an equilateral triangle.
This diagram is drawn accurately.



What fraction of the triangle is shaded?



What fraction of the square is shaded?

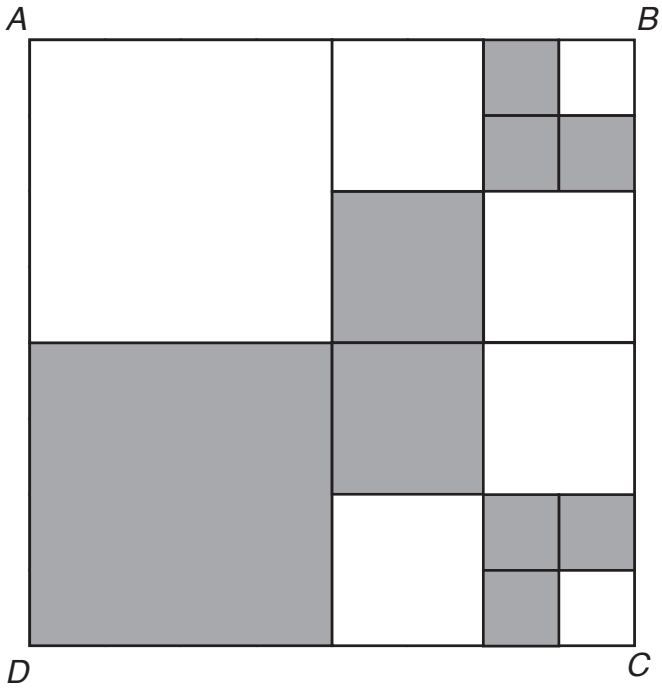
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16.10 Fractions of a shape advanced: Test

F/H

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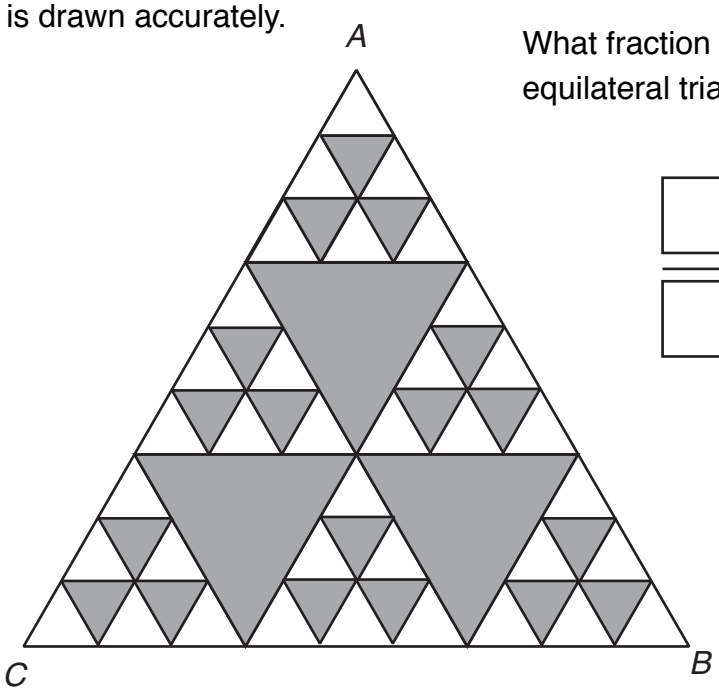
1 *ABCD* is a square.
This diagram is drawn accurately.



What fraction of the square is shaded?

$\frac{\square}{\square}$

2 *ABC* is an equilateral triangle.
This diagram is drawn accurately.



What fraction of the equilateral triangle is shaded?

$\frac{\square}{\square}$

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17 Graphs

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17.1 Conversion graphs introduction 1

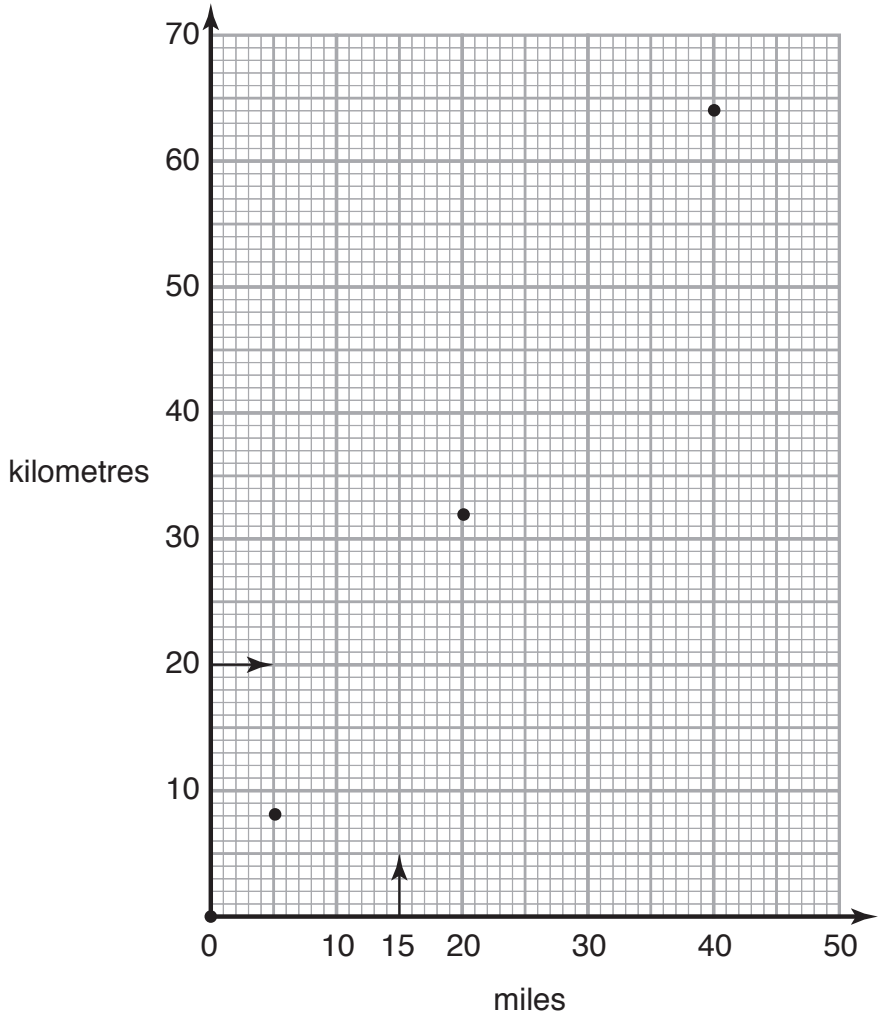
F/H

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1 You can use the information in the table to convert between kilometres and miles.

miles	0	5	20	40
kilometres	0	8	32	64

1a Use this information to draw a conversion graph.



1b Which is further, 15 miles or 20 kilometres?
You must show how you got your answer.

Answer _____

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17.1 Conversion graphs introduction 2

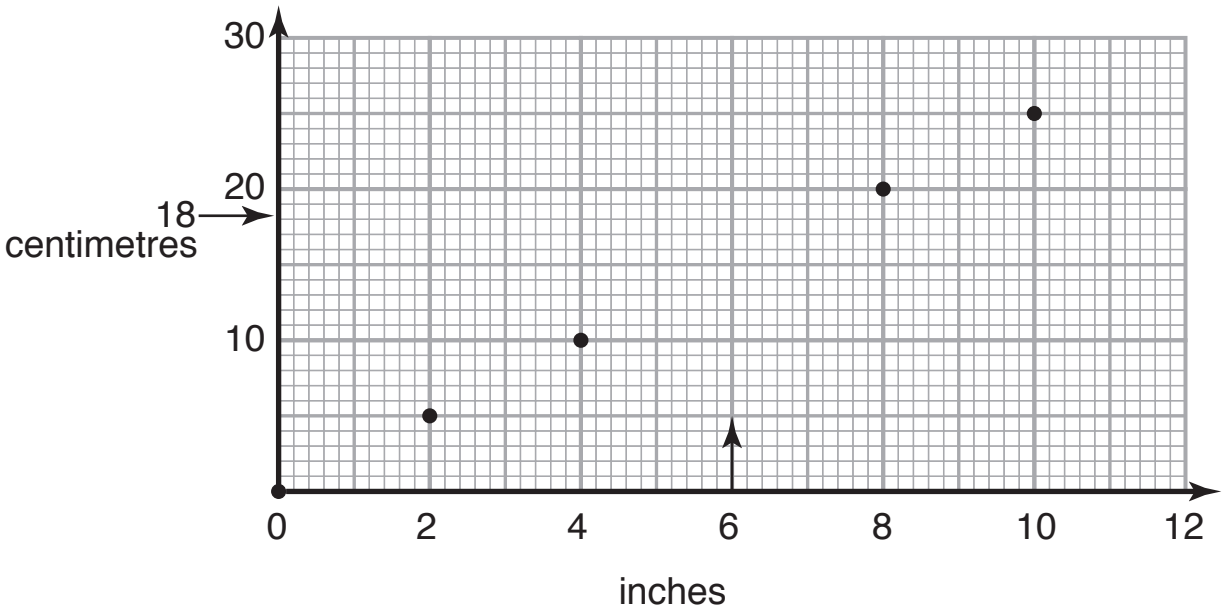
F/H

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1 You can use the information in the table to convert between centimetres and inches.

inches	2	4	8	10
centimetres	5	10	20	25

1a Use this information to draw a conversion graph.



1b Which is longer, 6 inches or 18 centimetres?
You must show how you got your answer.

Answer _____

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17.1 Conversion graphs introduction: Test

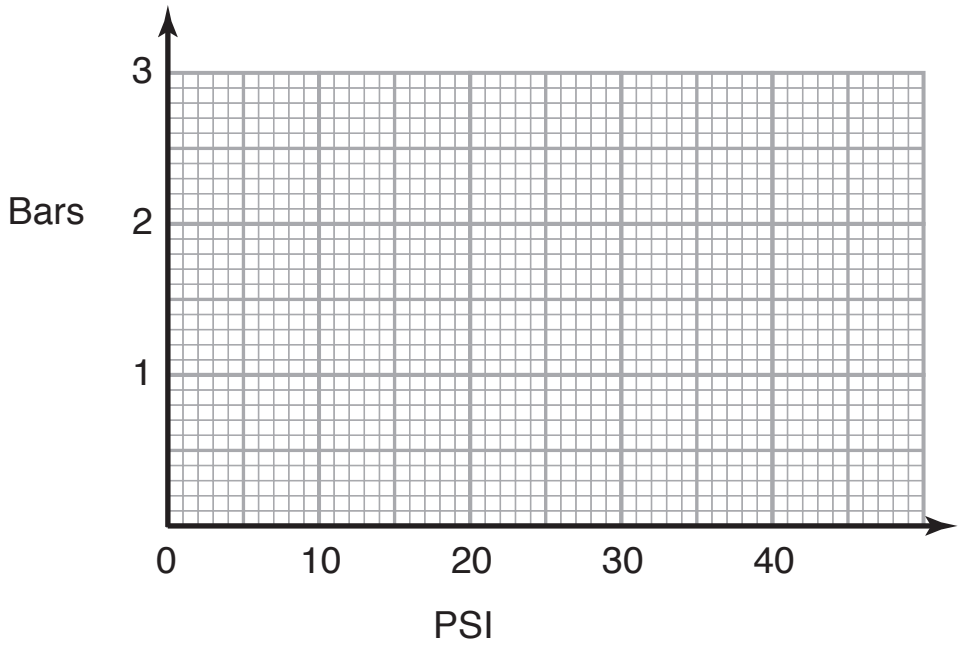
F/H

Licensed to The King's School, Devon

1 Tyre pressure for bicycles is measured in pounds per square inch (PSI) or Bars.
You can use the information in the table to convert between PSI and Bars.

inches	10	20	30	40
centimetres	0.7	1.4	2.1	2.8

1a Use this information to draw a conversion graph.



1b Which is greater, 25 PSI or 2 Bars?
You must show how you got your answer.

Answer _____

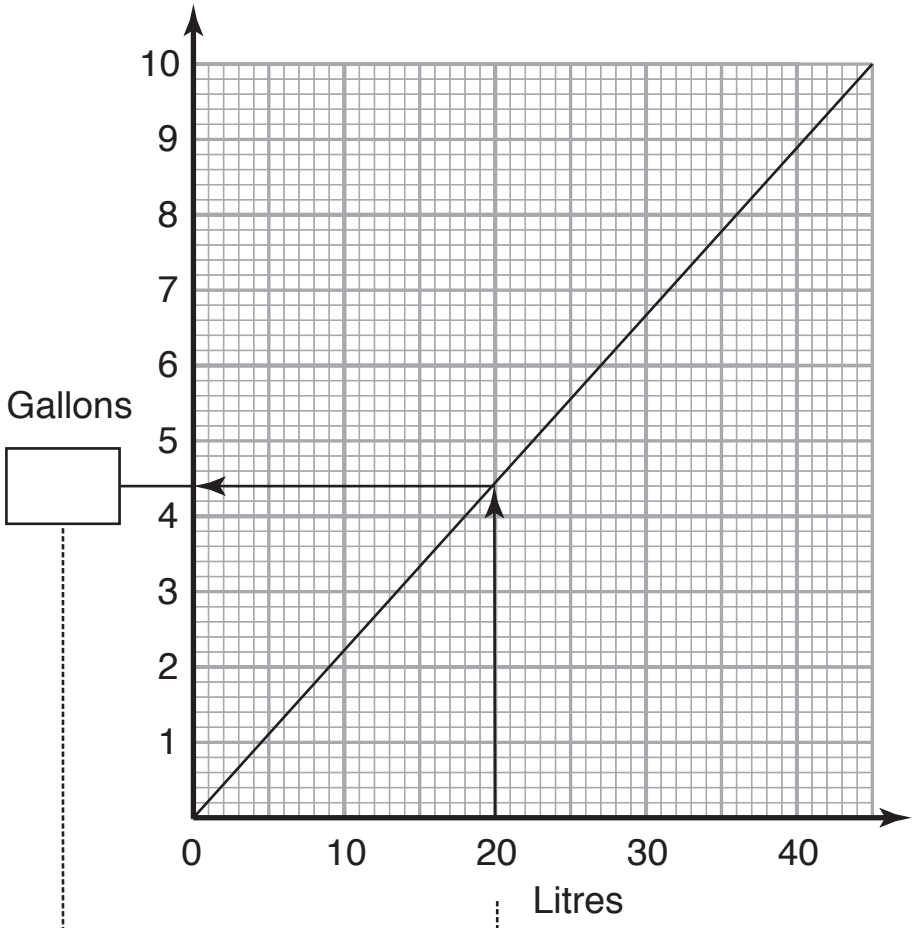
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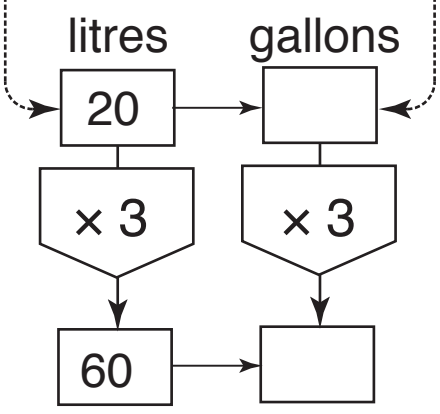
17.2 Conversion graphs advanced 1

F/H

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1 You can use this graph to change between litres and gallons.





1 Which is greater, 60 litres or 12 gallons?
You must show how you get your answer.

Answer _____

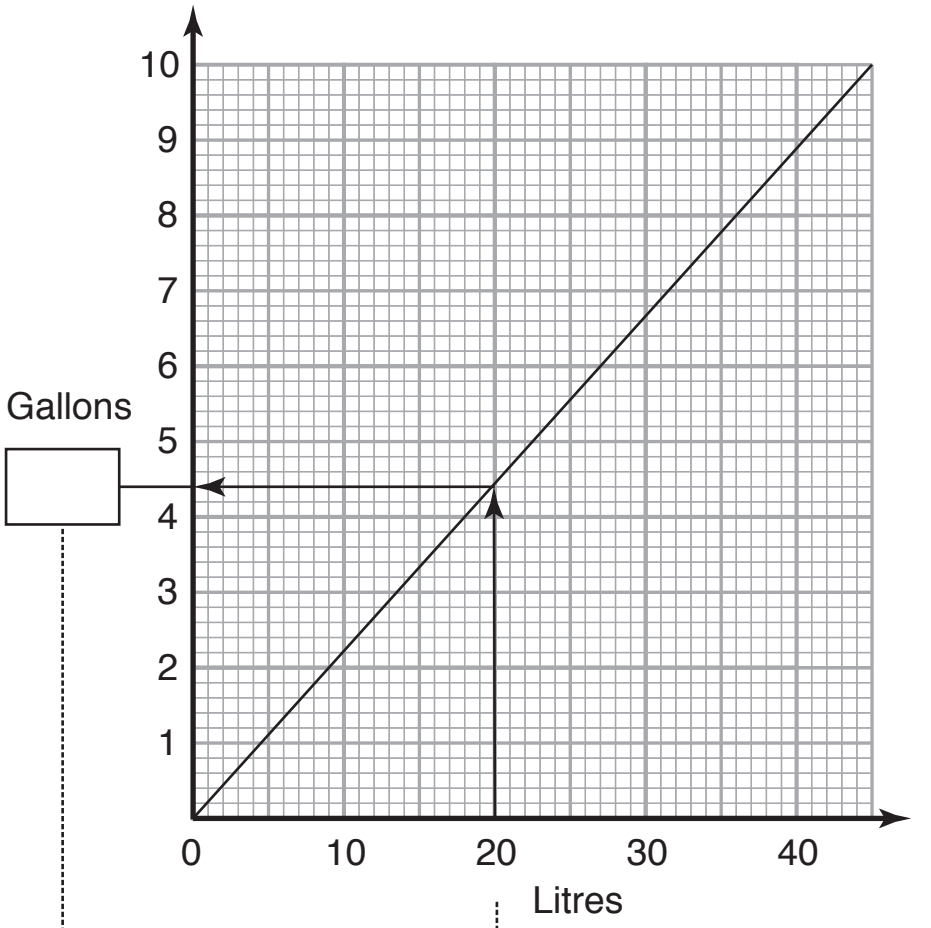
© Toticity Limited

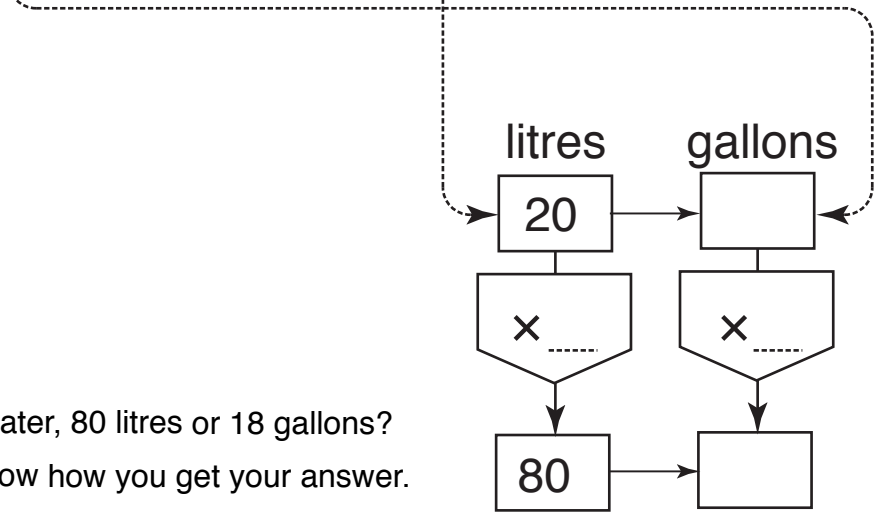
17.2 Conversion graphs advanced 2

F/H

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1 You can use this graph to change between litres and gallons.





1 Which is greater, 80 litres or 18 gallons?
You must show how you get your answer.

Answer _____

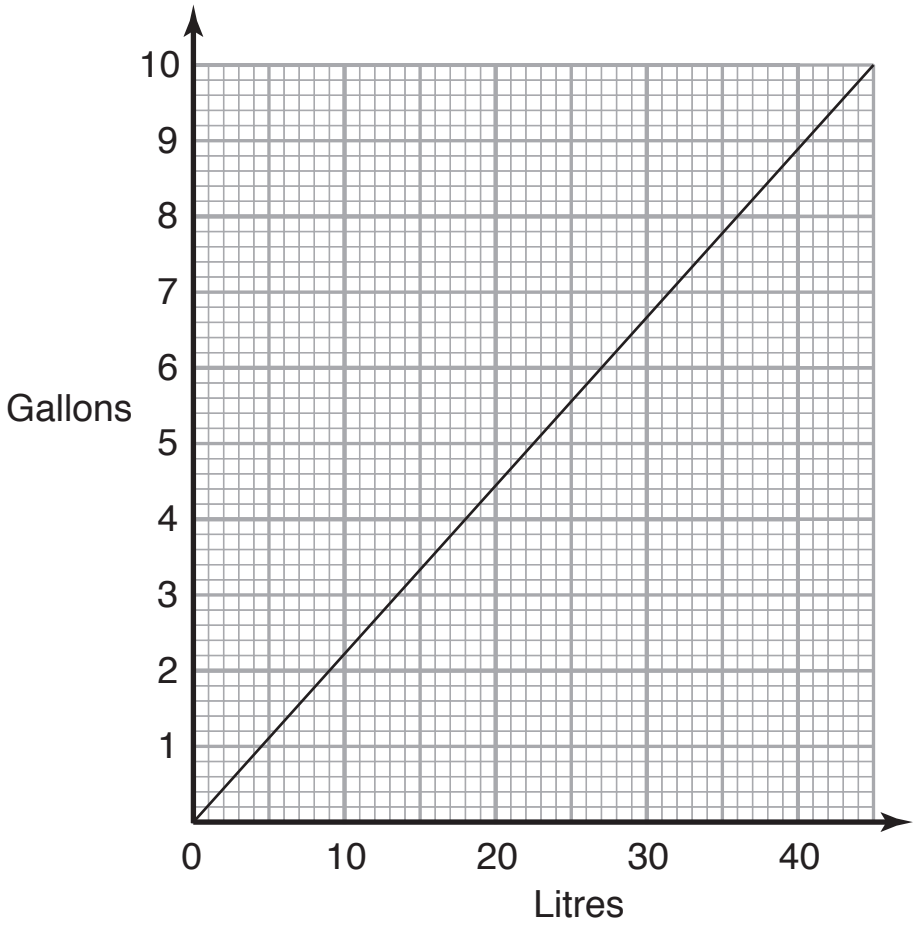
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17.2 Conversion graphs advanced: Test

F/H

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1 You can use this graph to change between litres and gallons.



1 Which is greater, 100 litres or 21 gallons?

You must show how you get your answer.

Answer _____

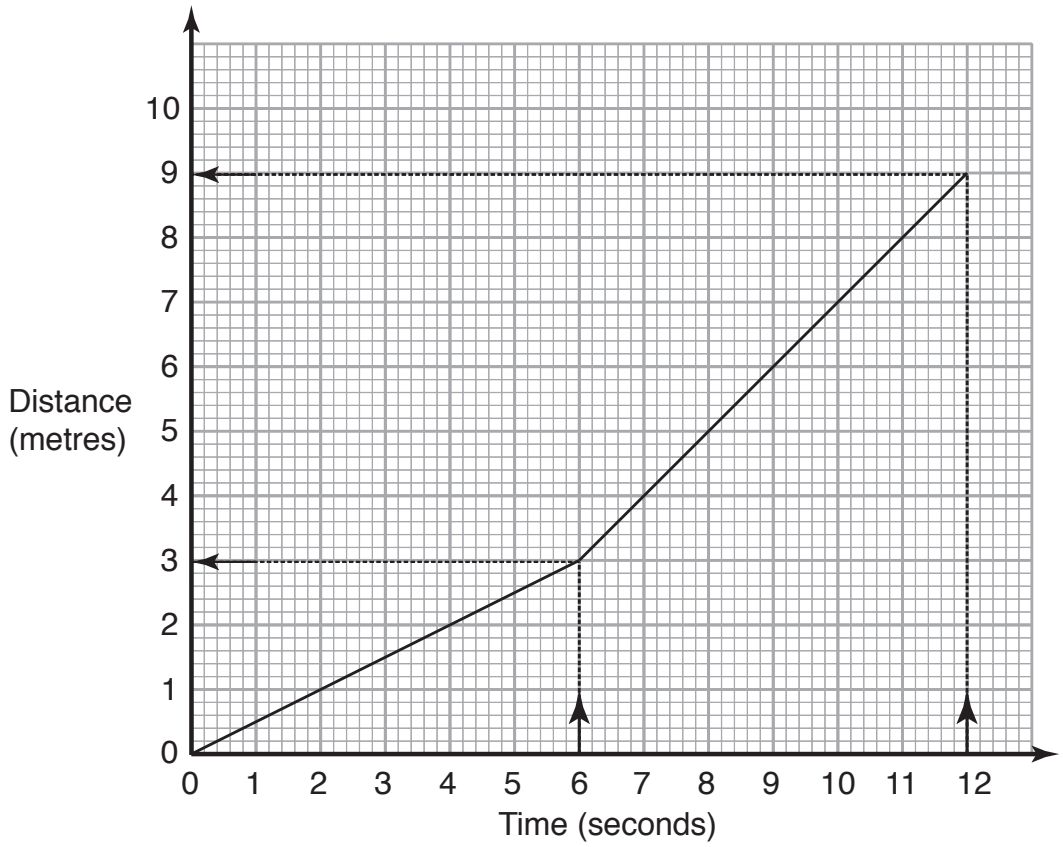
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17.3 Distance time graphs introduction 1

F/H

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1 The distance-time graph shows the journey of a toy train.



1a Calculate the speed for the **first** 6 seconds of the journey.

$$\square \div \square = \square \text{ m/s}$$

Distance Time Speed

1b Calculate the speed for the **last** 6 seconds of the journey.

$$\square \div \square = \square \text{ m/s}$$

Distance Time Speed

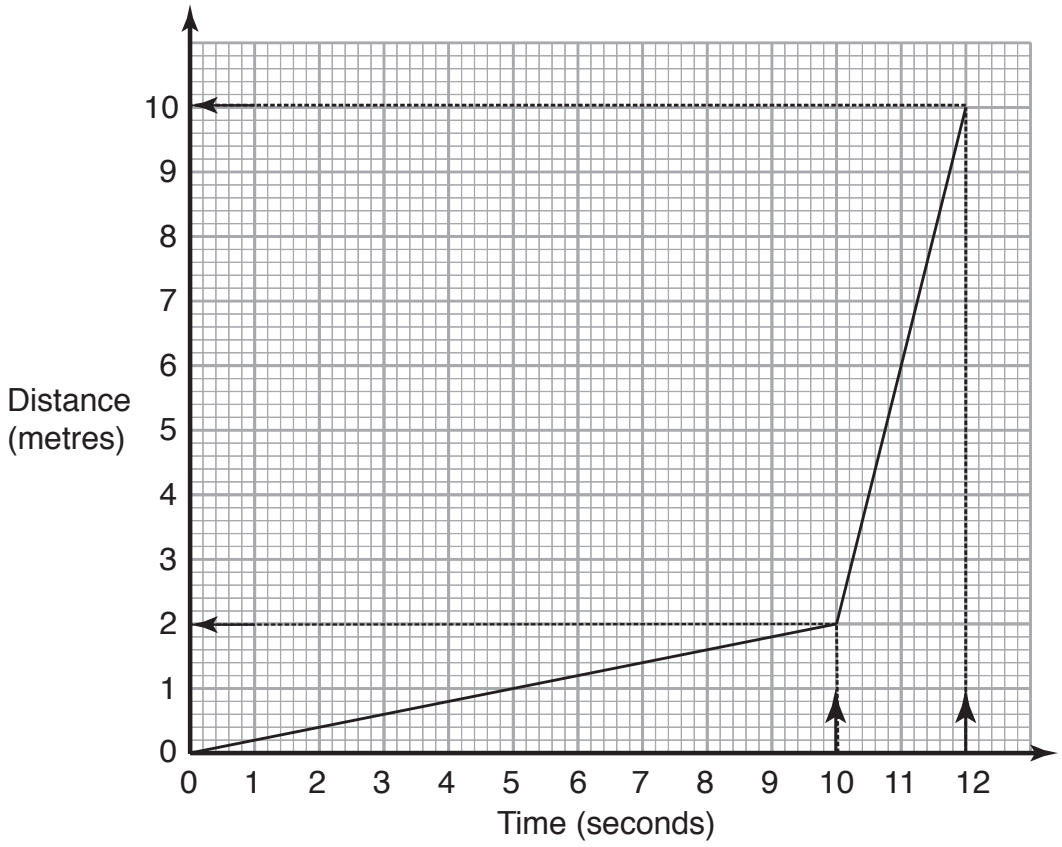
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17.3 Distance time graphs introduction 2

F/H

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1 The distance-time graph shows the journey of a racing car.



1a Calculate the speed for the **first** 10 seconds of the journey.

$$\square \div \square = \square \text{ m/s}$$

Distance Time Speed

1b Calculate the speed for the **last** 2 seconds of the journey.

$$\square \div \square = \square \text{ m/s}$$

Distance Time Speed

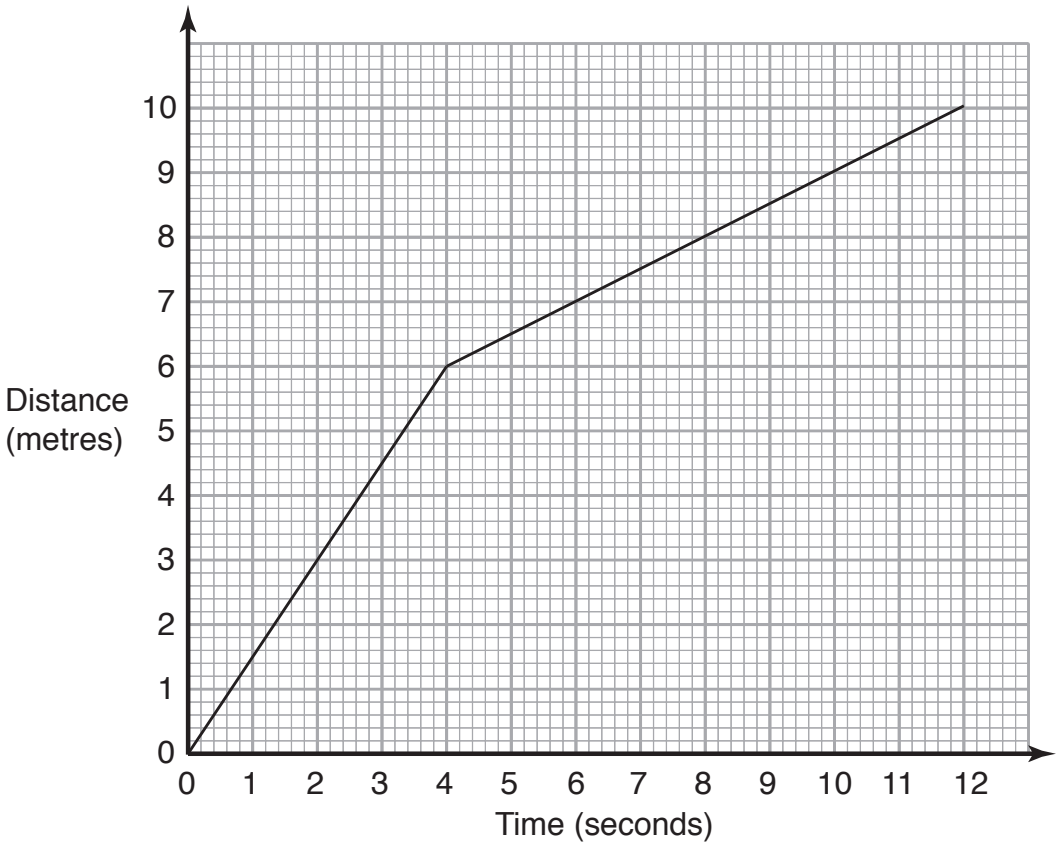
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17.3 Distance time graphs introduction: Test

F/H

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1 The distance-time graph shows the journey of a toy train.



1a Calculate the speed for the **first** 4 seconds of the journey.

Answer _____

1b Calculate the speed for the **last** 8 seconds of the journey.

Answer _____

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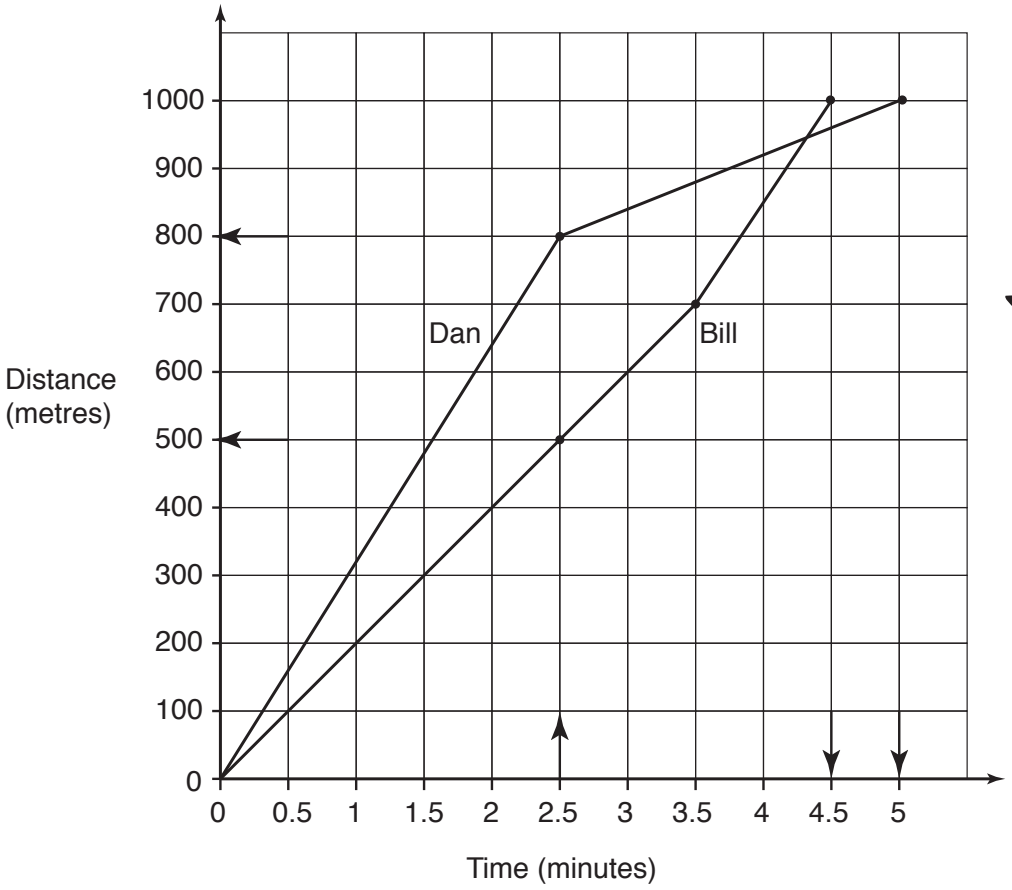
17.4 Distance time graphs next steps 1

F/H

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1 Bill and Dan ran a 1000 metre race.

The distance-time graph shows the race.





1a How far had Bill run after 2.5 minutes? ☐ metres

1b How far had Dan run after 2.5 minutes? ☐ metres

1c What happens to Dan's speed after 2.5 minutes? ☐ Increases ☐ Decreases

1d What happens to Bill's speed after 3.5 minutes? ☐ Increases ☐ Decreases

1e How many minutes does it take Bill to run 1000 metres? ☐ minutes

1f How many minutes does it take Dan to run 1000 metres? ☐ minutes

1g Who won the race? ☐ Bill ☐ Dan

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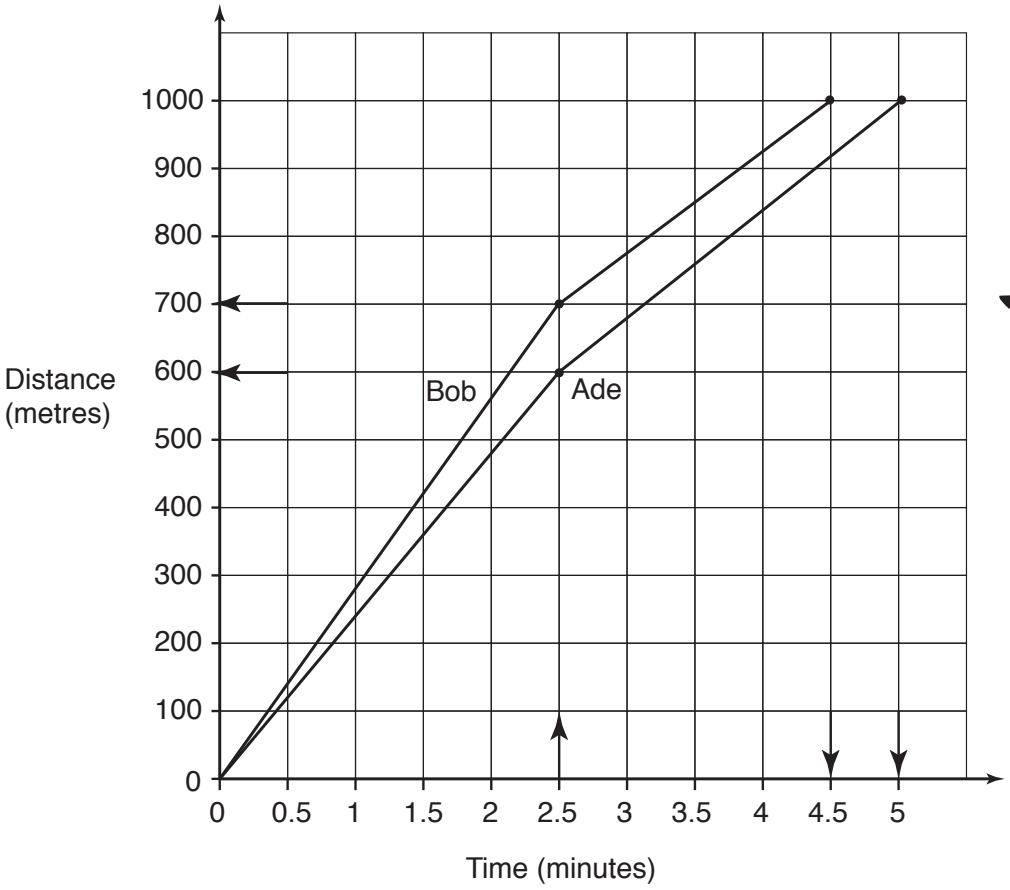
17.4 Distance time graphs next steps 2

F/H

Licensed to The King's School, Devon

1 Bob and Ade ran a 1000 metre race.

The distance-time graph shows the race.





1a How far had Bob run after 2.5 minutes? ☐ metres

1b How far had Ade run after 2.5 minutes? ☐ metres

1c What happens to Bob's speed after 2.5 minutes? ☐ Increases ☐ Decreases

1d What happens to Ade's speed after 3.5 minutes? ☐ Increases ☐ Decreases

1e How many minutes does it take Bob to run 1000 metres? ☐ minutes

1f How many minutes does it take Ade to run 1000 metres? ☐ minutes

1g Who won the race? ☐ Bob ☐ Ade

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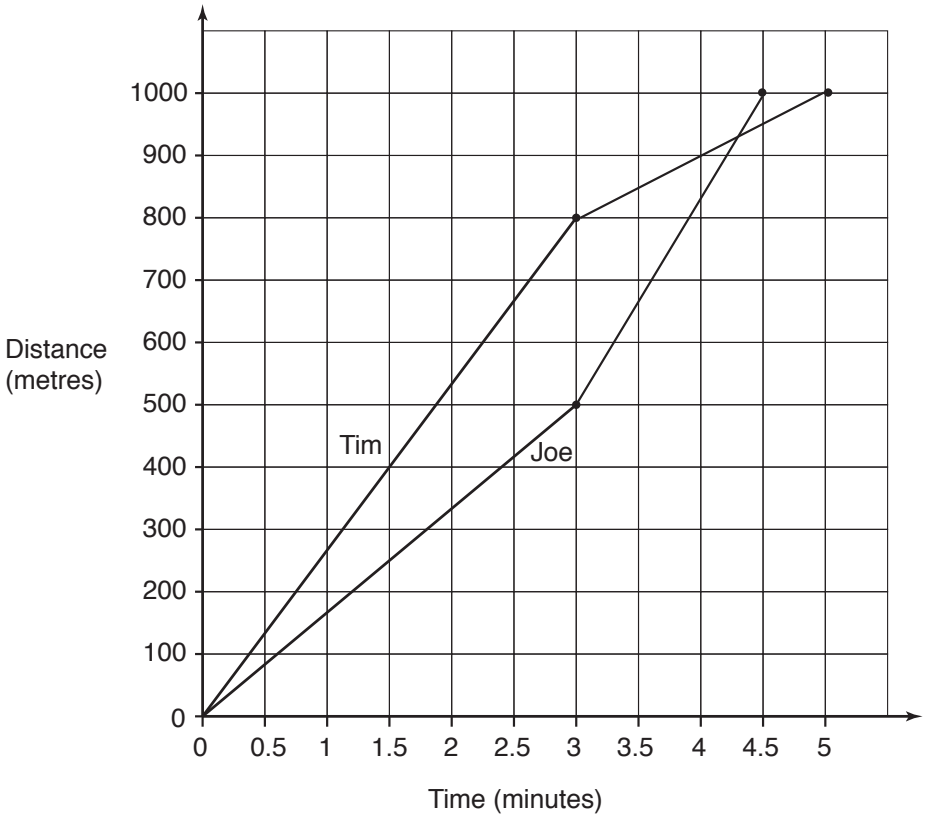
17.4 Distance time graphs next steps: Test

F/H

Licensed to The King's School, Devon

1 Tim and Joe ran a 1000 metre race.

The distance-time graph shows the race.





1a Who won the race?

Give a reason for your answer.

Answer _____

1b Describe the race.

Answer _____

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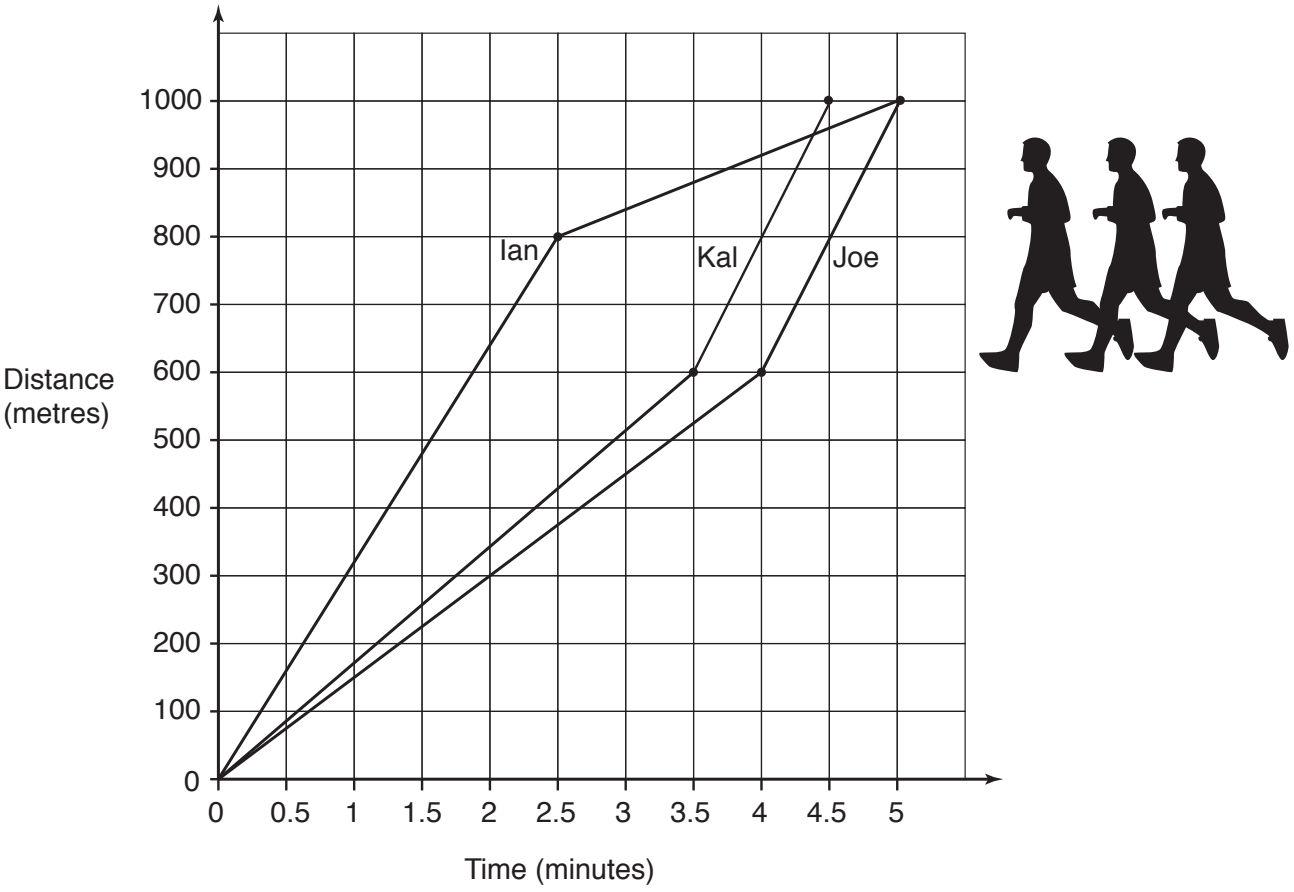
17.5 Distance time graphs advanced 1

F/H

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1 Ian, Kal and Joe ran a 1000 metre race.

The distance-time graph shows the race.



1a Who is in the lead after 2.5 minutes? ☐ Ian ☐ Kal ☐ Joe

1b What happens to Ian's speed after 2.5 minutes? ☐ Increases ☐ Decreases

1c Do Kal and Joe run at the same speed as each for the last 400 m of the race? ☐ Yes ☐ No

1d At approximately what time does Kal overtake Ian? ☐ minutes

1e Who won the race? ☐ Ian ☐ Kal ☐ Joe

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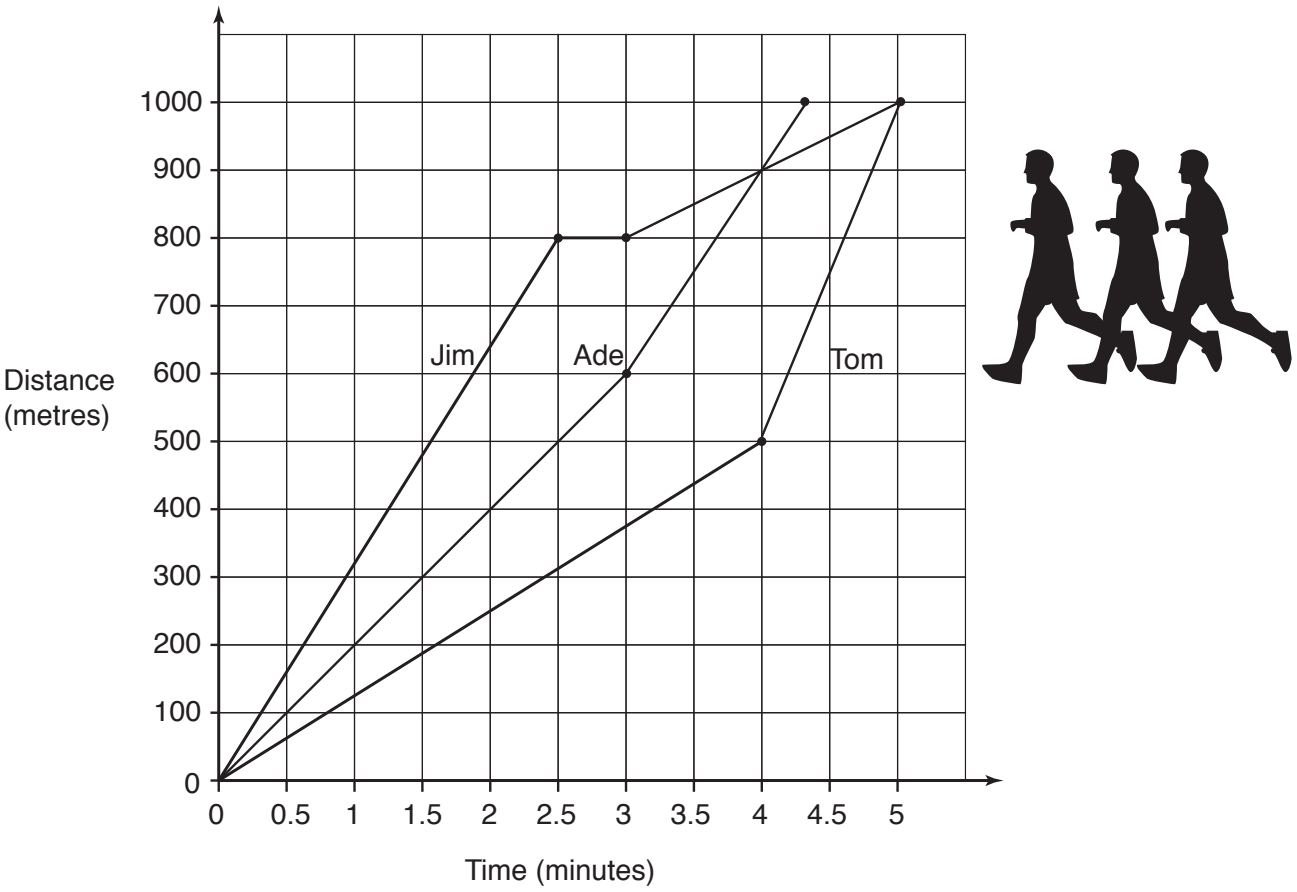
17.5 Distance time graphs advanced 2

F/H

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1 Jim, Ade and Tom ran a 1000 metre race.

The distance-time graph shows the race.



1a What does Jim do at 800 m? ☐ Stops ☐ Increases his speed

1b What happens to Tom's speed after 4 minutes? ☐ Increases ☐ Decreases

1c What happens to Ade's speed after 4 minutes? ☐ Increases ☐ Decreases

1d At what time does Ade overtake Jim? ☐ minutes

1e Who won the race? ☐ Jim ☐ Ade ☐ Tom

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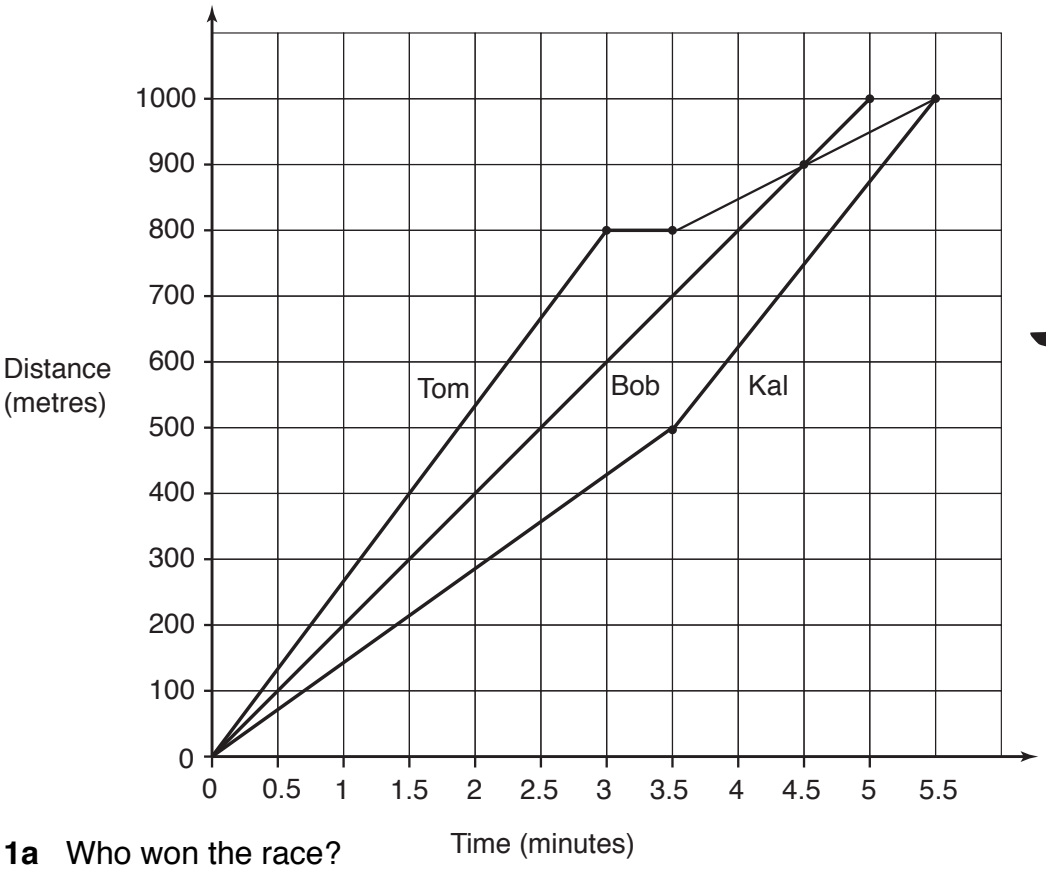
17.5 Distance time graphs advanced: Test

F/H

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1 Tom, Bob and Kal ran a 1000 metre race.

The distance-time graph shows the race.





1a Who won the race?

Give a reason for your answer.

Answer _____

1b Describe the race.

Answer _____

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18 Pythagoras' Theorem

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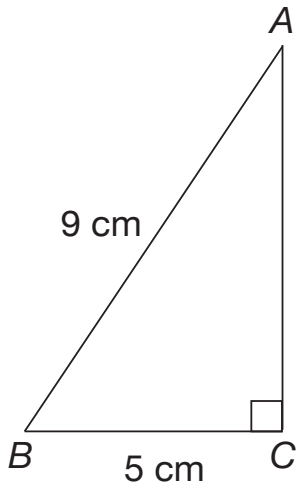
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18.1 Pythagoras' introduction 1

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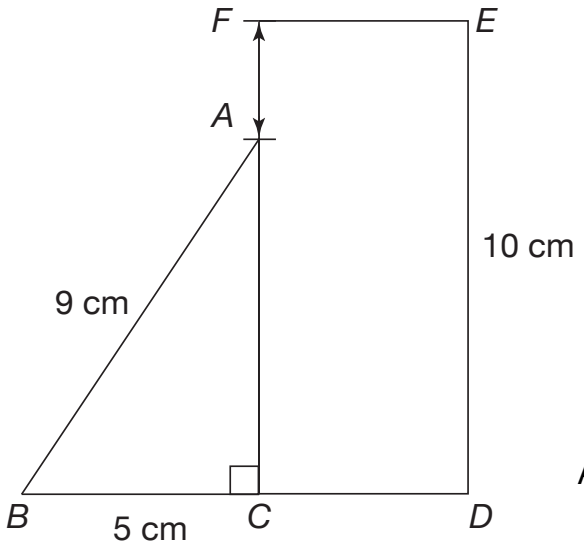
1 Here is a triangle *ABC*



1 a Using Pythagoras' Theorem calculate length *AC*

Answer _____ cm

1 b Length *ED* is 10 cm. Work out the length *AF*



Answer _____ cm

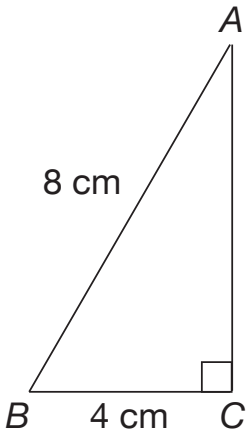
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18.1 Pythagoras' introduction 2

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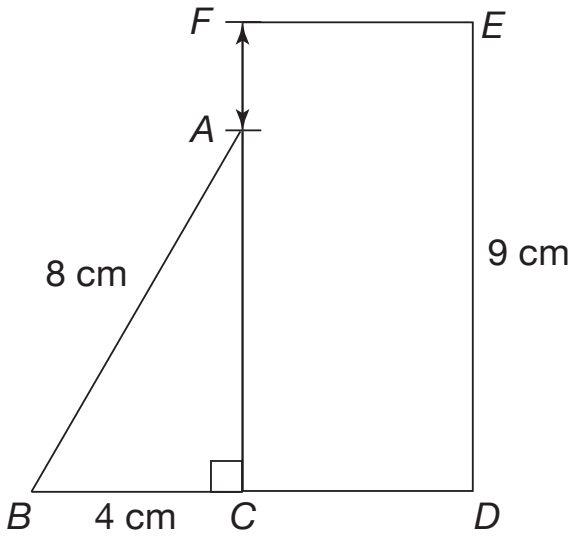
1 Here is a triangle *ABC*



1 a Using Pythagoras' Theorem calculate length *AC*

Answer _____ cm

1 b Length *ED* is 10 cm. Work out the length *AF.*



Answer _____ cm

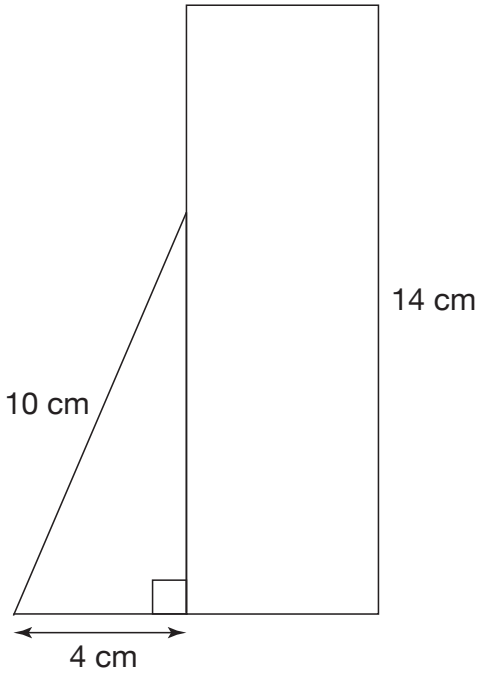
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18.1 Pythagoras' introduction: Test

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1 A ladder of length 10 m is leaning against a wall.
The foot of the ladder is 4 m from the wall.
The wall is 14 m tall.



Work out the distance from the top of the ladder to the top of the wall.

Answer _____

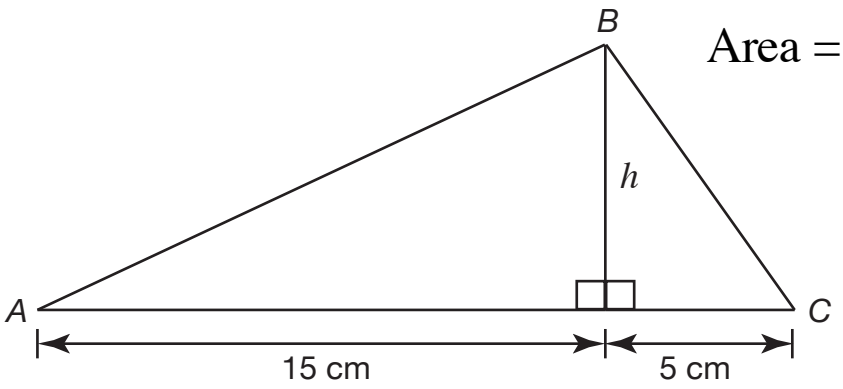
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18.2 Pythagoras' next steps 1

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1 The area of triangle *ABC* is 70 cm²



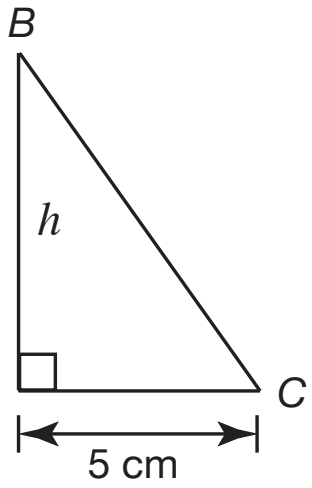
$$\text{Area} = \frac{\text{base} \times \text{height}}{2}$$

1 a Calculate height h

$$70 = \frac{\square \times h}{2}$$

Answer _____ cm

1 b Using Pythagoras' Theorem calculate length *BC*



Answer _____ cm

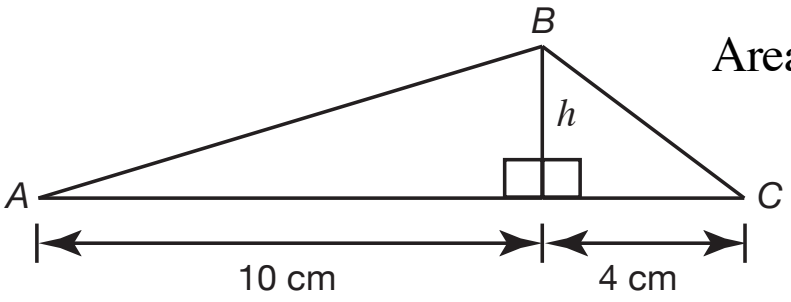
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18.2 Pythagoras' next steps 2

F/H

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1 The area of triangle *ABC* is 21 cm^2



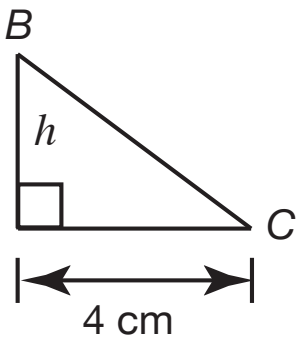
$$\text{Area} = \frac{\text{base} \times \text{height}}{2}$$

1 a Calculate height h

$$21 = \frac{\square \times h}{2}$$

Answer _____ cm

1 b Using Pythagoras' Theorem calculate length *BC*



Answer _____ cm

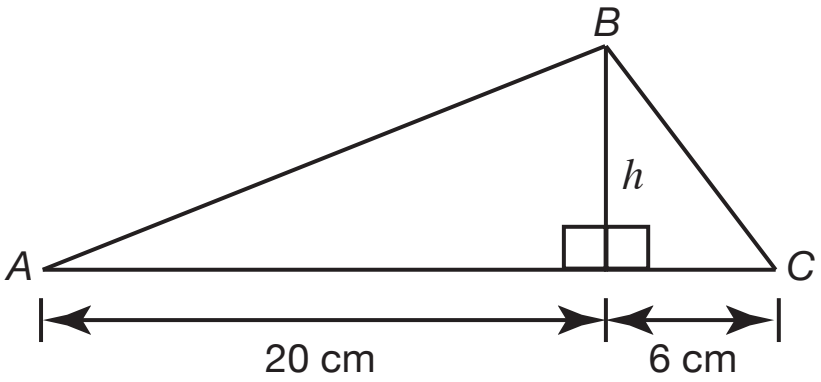
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18.2 Pythagoras' next steps : Test

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1 In the diagram the area of triangle *ABC* is 104 cm^2



Work out the length of *BC*

Answer _____

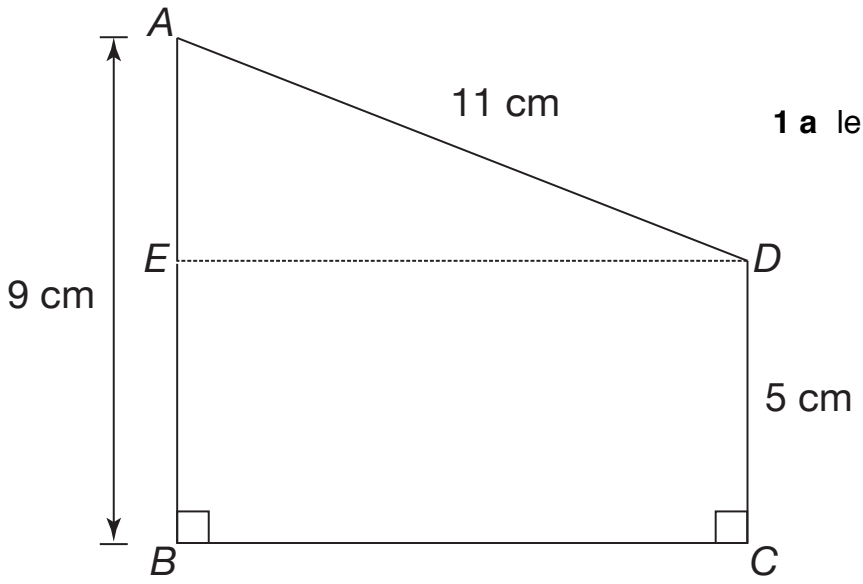
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18.3 Pythagoras' Advanced 1

F/H

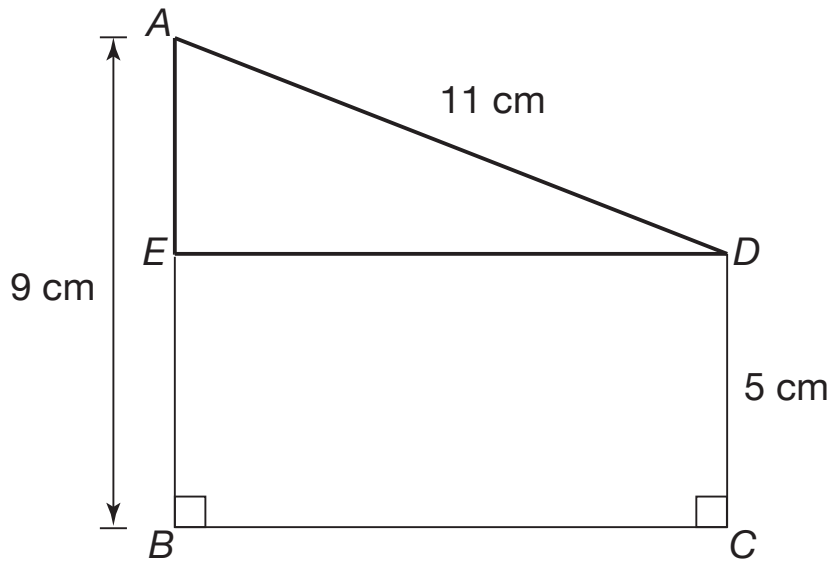
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1 Here is a trapezium *ABCD* .



1 a length *AE* = ☐ cm

1 b Using Pythagoras' Theorem calculate length *ED* and *BC*



Answer _____ cm

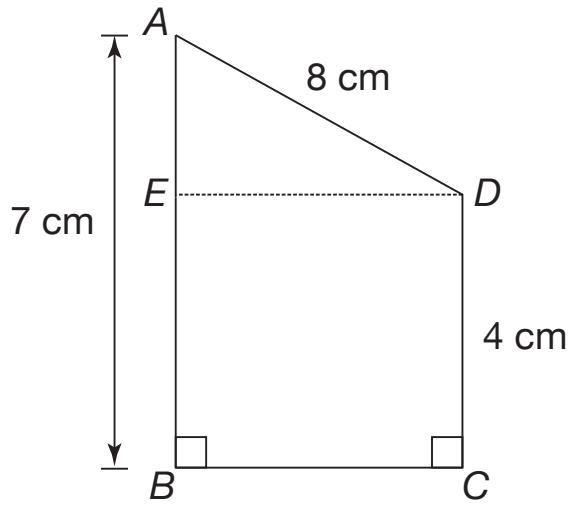
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18.3 Pythagoras' Advanced 2

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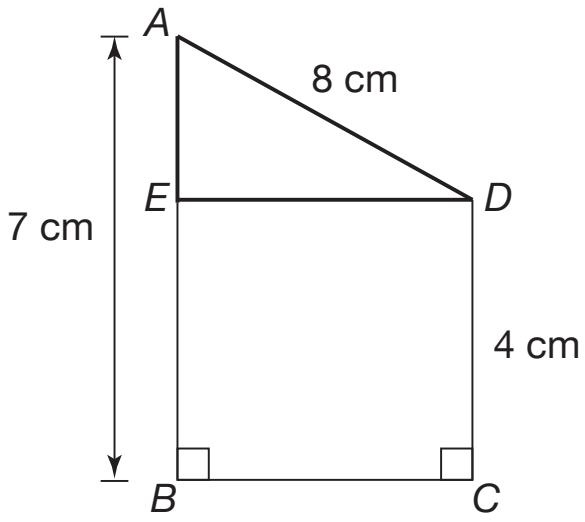
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1 Here is a trapezium *ABCD* .



1 a length *AE* = ☐ cm

1 b Using Pythagoras' Theorem calculate length *ED* and *BC*



Answer _____ cm

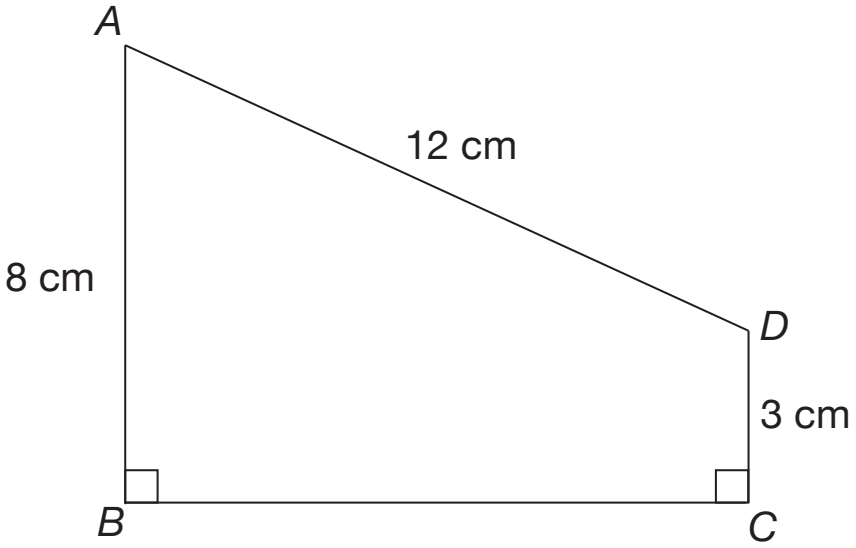
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18.3 Pythagoras' Advanced : Test

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1 *ABCD* is a trapezium.



Work out the length of *BC.*
You must show your woking.

Answer _____

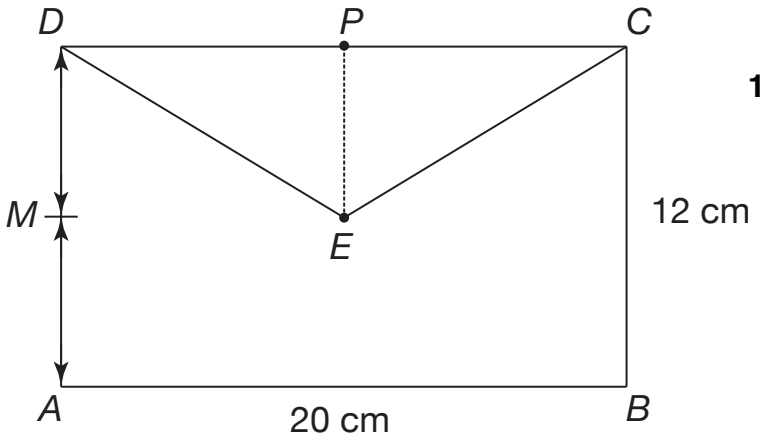
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18.4 Pythagoras' Extension 1

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1 *M* is the midpoint of the line *DA*
P is the midpoint of the line *DC*

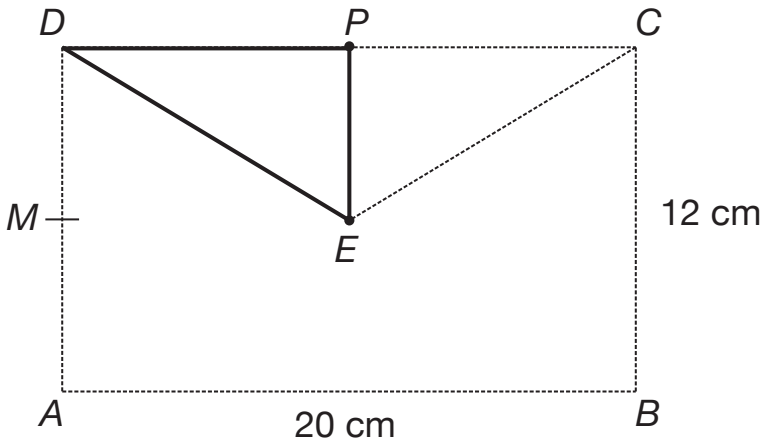


1 a length *DM* = ☐ cm

length *PE* = ☐ cm

length *DP* = ☐ cm

1 b Using Pythagoras' Theorem calculate length *DE.*



Answer _____ cm

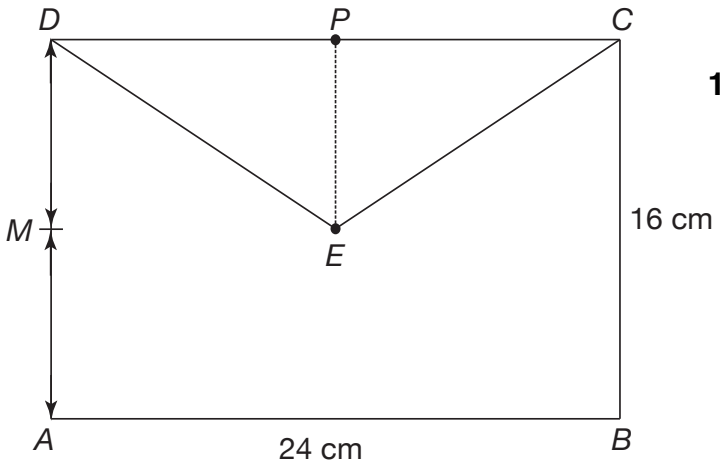
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18.4 Pythagoras' Extension 2

F/H

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1 *M* is the midpoint of the line *DA*
P is the midpoint of the line *DC*

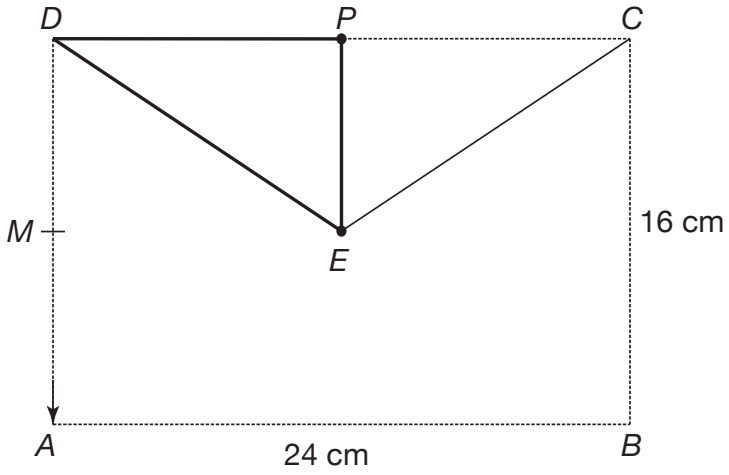


1 a length *DM* = ☐ cm

length *PE* = ☐ cm

length *DP* = ☐ cm

1 b Using Pythagoras' Theorem calculate length *DE*.



Answer _____ cm

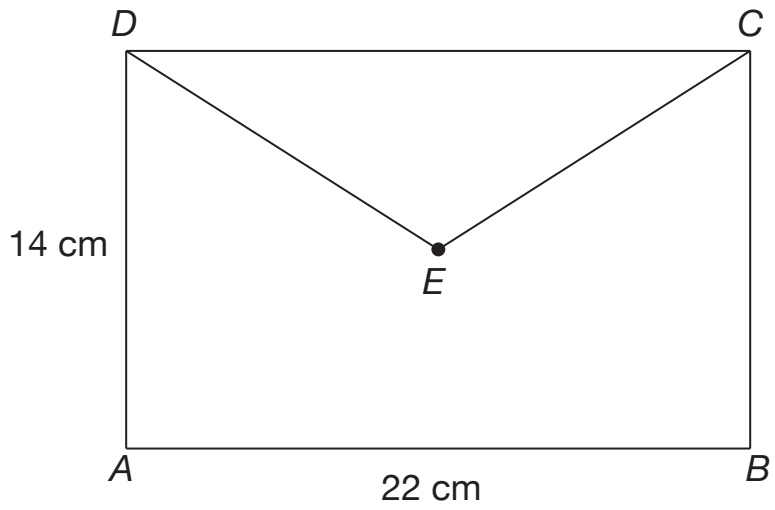
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18.4 Pythagoras' Extension: Test

F/H

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1 *E* is the centre of rectangle *ABCD*



Work out the length *DE.*

Answer _____

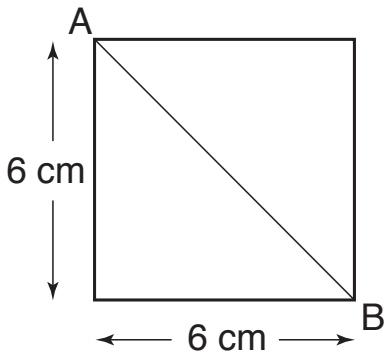
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18.5 Pythagoras' application 1

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1 Here is a square of side 6 cm



1 a Use Pythagoras' Theorem to calculate the length of diagonal *AB.*
Write your answer as a square root.

Answer $\sqrt{}$ cm

1 b Write whole numbers in the boxes.

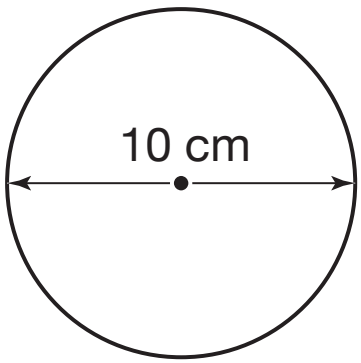
$\square$ cm < $\sqrt{}$ cm < $\square$ cm

length *AB*

1 c Will the square fit inside this circle without touching the edge of the circle?
Tick your answer:

☐ yes

☐ no



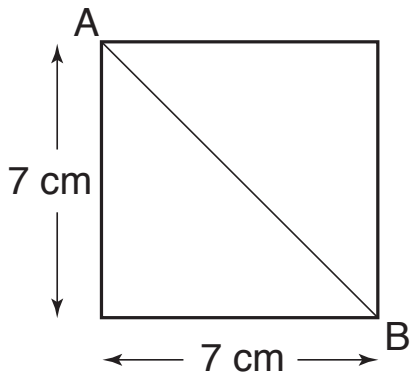
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18.5 Pythagoras' application 2

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1 Here is a square of side 7 cm



1 a Use Pythagoras' Theorem to calculate the length of diagonal *AB.*
Write your answer as a square root.

Answer $\sqrt{}$ cm

1 b Write whole numbers in the boxes.

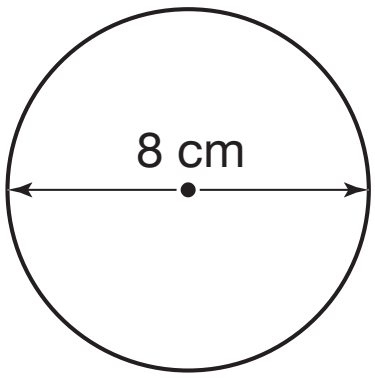
$\square$ cm < $\sqrt{}$ cm < $\square$ cm

length *AB*

1 c Will the square fit inside this circle without touching the edge of the circle?
Tick your answer:

☐ yes

☐ no



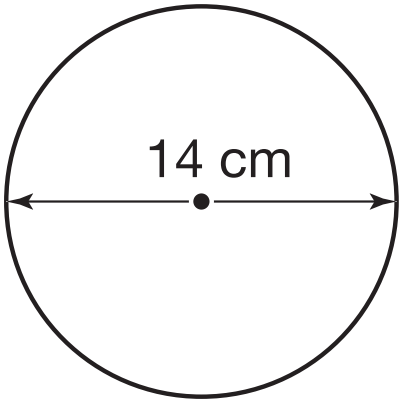
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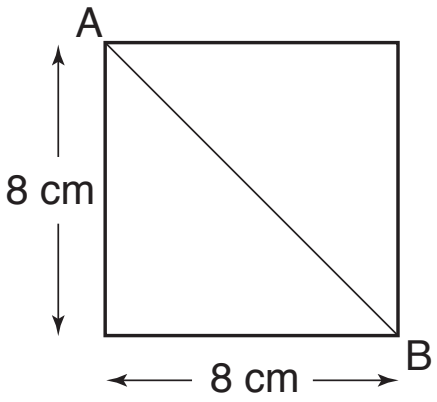
18.5 Pythagoras' application : Test

F/H

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1 A circle has diameter 14 cm
A square has side length 8 cm





Use Pythagoras' theorem to show that the square will fit inside the circle without touching the edge of the circle.

Answer _____

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