

Practice National Curriculum Test

Key stage 2

Mathematics

Paper 3: reasoning

First name	
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Middle name	
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Last name	
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Date of birth	Day		Month		Year	
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School name	
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Instructions

You **must not use a calculator** to answer any questions in this test.

Questions and answers

You have **40 minutes** to complete this test.

Follow the instructions for each question.

Work as quickly and as carefully as you can.

If you need to do working out, you can use the space around the question.

Some questions have a method box like this:

Show
your
method

For these questions, you may get a mark for showing your method.

If you cannot do a question, **go on to the next one.**

You can come back to it later, if you have time.

If you finish before the end, **go back and check your work.**

Marks

The number under each box at the side of the page tells you the number of marks available for each question.

1

Ben is making a sequence, starting with 300.

He subtracts 95 each time.

Write the missing numbers in the boxes.

300

205

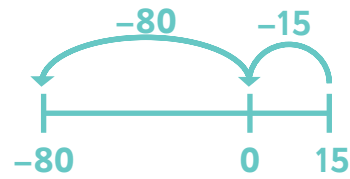
110

15

-80

1 mark

$$\begin{array}{r} \overset{0}{\cancel{1}} \overset{10}{\cancel{0}} \overset{1}{\cancel{0}} \\ - \quad \quad 9 \quad 5 \\ \hline \quad \quad 1 \quad 5 \end{array}$$



2

Order the numbers starting with the largest.

Match each number with its order.

Look at each digit individually and compare.

1,023,201

3rd

1,203,001

2nd

1,023,021

4th

1,203,012

largest

1st

largest

2nd

3rd

4th

smallest

1 mark



3

Round **218.45****218.45** to one decimal placeLook at the **hundredths digit**.The **tenths digit** rounds **up**.**218.5****218.45** to the nearest whole numberLook at the **tenths digit**.The **ones digit** rounds **the same**.**218****218.45** to the nearest 10Look at the **ones digit**.The **tens digit** rounds **up**.**220**

2 marks

4

Write the number that is **100 times greater** than four hundred and eighteen.**418****41,800**

1 mark

100 times greater means my digits will move two places to the left.


418
41800



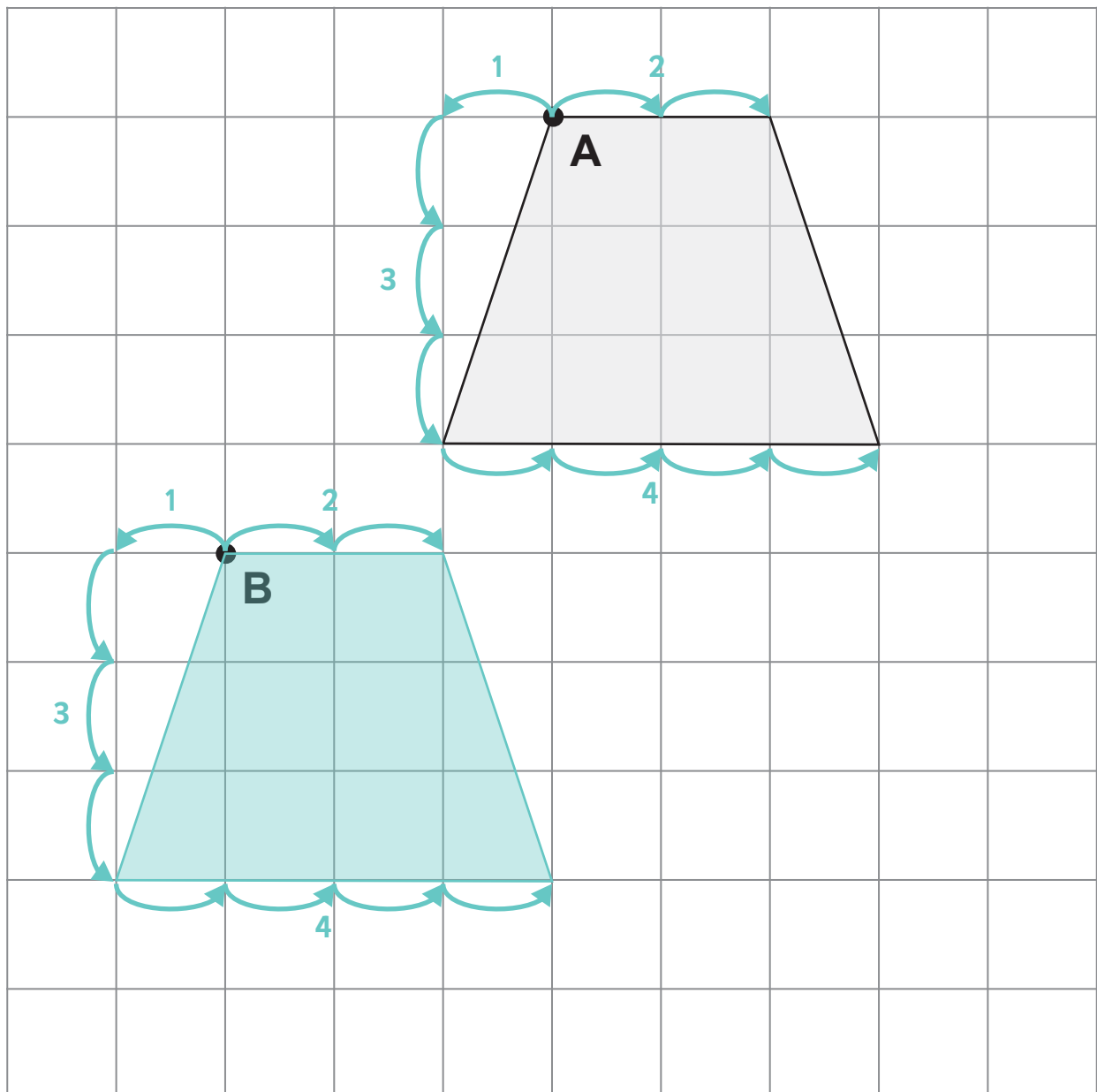
5

Here is a shape on a grid.

The shape is translated so that point A moves to point B.

Draw the shape in its new position.

Use a ruler.



Count squares to help make sure your translation shape looks the same.



1 mark

6

Match each fraction to its equivalent simplified fraction.

Simplify the fractions

$$\frac{3}{5} \xrightarrow{\div 5} \frac{15}{25}$$

$$\frac{3}{10} \xrightarrow{\div 2} \frac{6}{20}$$

$$\frac{3}{4} \xrightarrow{\div 3} \frac{9}{12}$$

$$\frac{1}{2} \xrightarrow{\div 12} \frac{12}{24}$$

$$\frac{3}{8} \xrightarrow{\div 2} \frac{6}{16}$$

$$\frac{1}{2}$$

$$\frac{3}{5}$$

$$\frac{3}{10}$$

$$\frac{3}{8}$$

$$\frac{3}{4}$$



1 mark

7

Write the missing number to make this addition correct.

$$200,000 + \boxed{70,000} + 60 = 270,060$$

~~270,060~~


1 mark



8 Three different single-digit numbers multiply to make 105.

Find the missing numbers.

$$\boxed{5} \times \boxed{3} \times \boxed{7} = \boxed{105}$$



1 mark

$$\begin{array}{r} 21 \\ 5 \overline{) 105} \end{array}$$

$$3 \times 7 = 21$$

9 Find a **square** number and a **cube** number that have a sum of 100.

$$\boxed{36} + \boxed{64} = \boxed{100}$$

square number cube number

Square numbers:

1 **36**
4 **49**
9 **64**
16 **81**
25

Cube numbers:

1
8
27
64



1 mark

10

James is looking at the numbers below.

$$211 - 200 = 11$$

211

11 away from
200

$$200 - 198 = 2$$

198

2 away from
200

$$204 - 200 = 4$$

204

4 away from
200

$$200 - 187 = 13$$

187

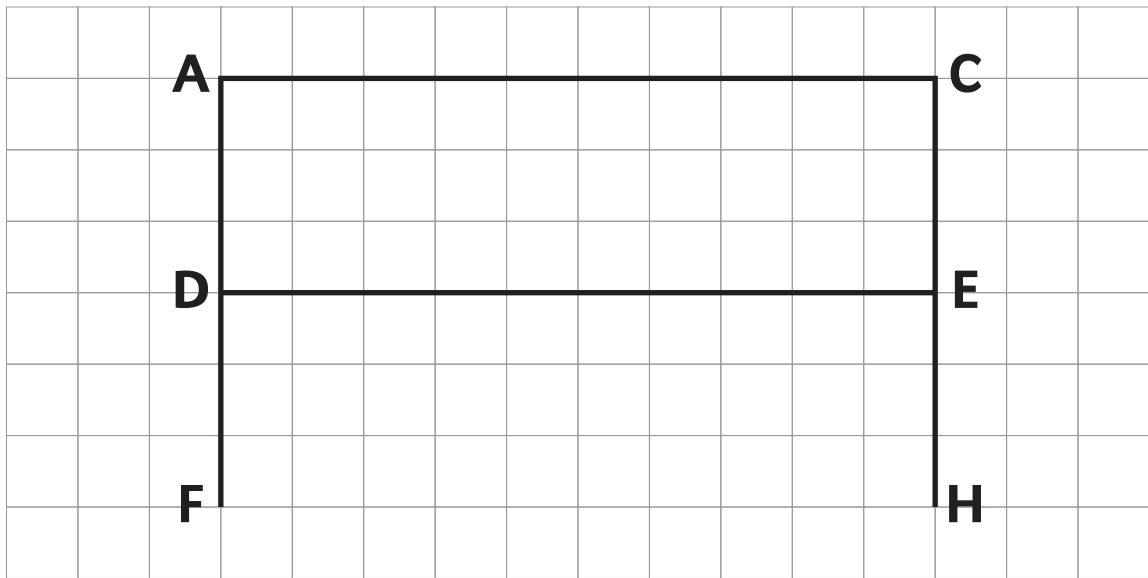
13 away from
200

Which number is closest to 200?

198☐**1 mark**

Which number is furthest from 200?

187☐**1 mark**



Tick **all** the correct statements.

AC is parallel to DE



DE is parallel to AF



AF is perpendicular to CH



CH is perpendicular to DE



1 mark

parallel: //

perpendicular: 

12 Shen buys 4 large trays of cupcakes and 6 small trays of cupcakes.

Each large tray has 22 cupcakes and each small tray has 12 cupcakes.

How many **cupcakes** does Shen buy?

Show
your
method

Large trays:

4 trays, 22 cupcakes

$4 \times 22 = 88$ cupcakes

Small trays:

6 trays, 12 cupcakes

$6 \times 12 = 72$ cupcakes

$$\begin{array}{r}
 88 \\
 + 72 \\
 \hline
 160
 \end{array}$$

160

☐

2 marks

13 Fill in the missing numbers.

Use the inverse to find the missing numbers.

$$\begin{array}{r}
 211 \\
 + 87 \\
 \hline
 298
 \end{array}$$

298

–

211

=

87

☐

1 mark

22

×

16

=

352

☐

1 mark

$$\begin{array}{r}
 016 \\
 22 \overline{)352} \\
 \underline{- 22} \\
 132 \\
 \underline{- 132} \\
 0
 \end{array}$$

OR

$$2 \overline{)176}$$

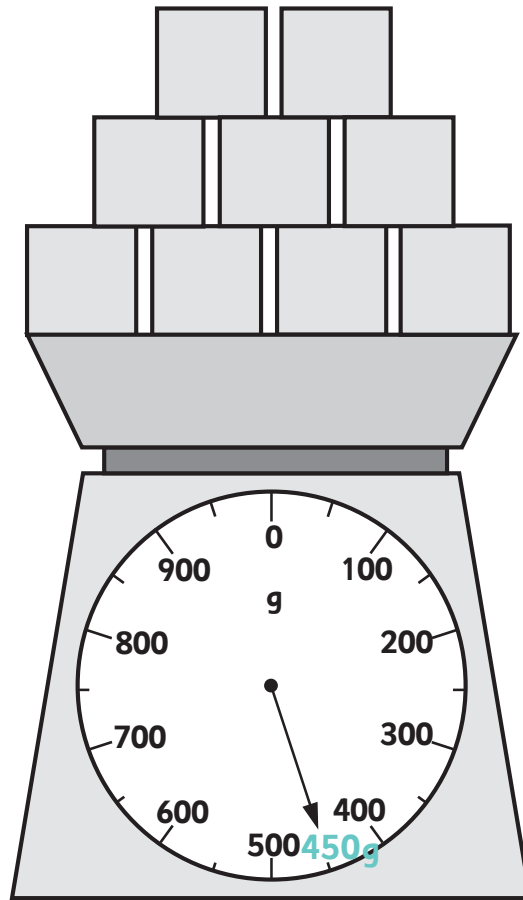
$$11 \overline{)176}$$

14

Sarah has built a tower out of blocks.

Each block has the same mass.

She places her tower on the scales.



She removes one block.

What does the scale read now?

Show
your
method

The measurement on the scale is 450 g.
There are 9 blocks on the scale.

$$450 \div 9 = 50 \text{ g}$$

So, 1 block = 50 g

Remove 1 block:
 $450 - 50 = 400 \text{ g}$

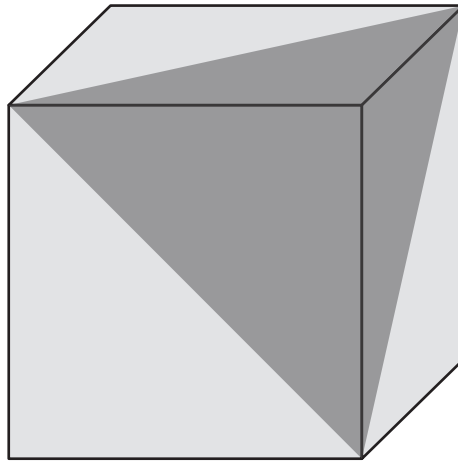
400

2 marks

15

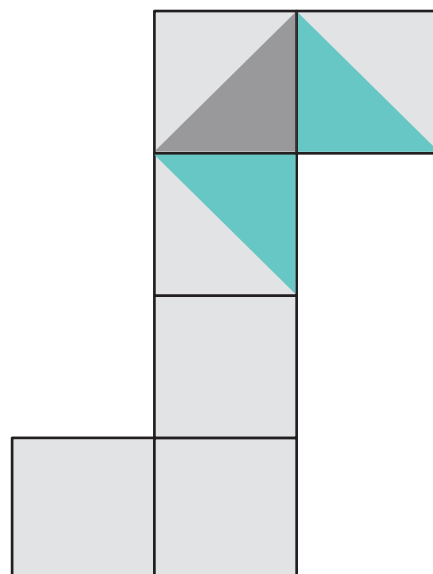
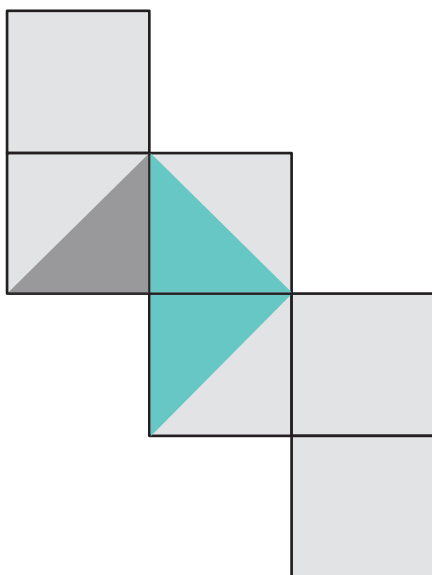
Here is a cube.

Three faces of a cube are shaded diagonally, with half of each face shaded.



Below are two nets of the cube. Part of each net has been shaded.

Complete the missing shading.



1 mark

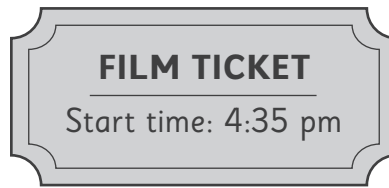


1 mark



16

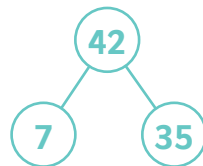
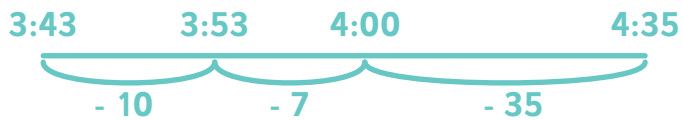
Abdul is going to see a film.



It takes Abdul 42 minutes to get from his house to the cinema.

He needs to arrive 10 minutes before the film starts.

What is the latest time Abdul can leave his house?



3:43

pm



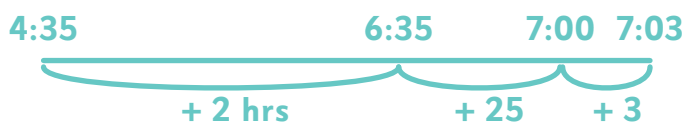
1 mark

When the film finishes, Abdul's watch shows this time:



19:03 = 7:03 pm

How long was the film in hours and minutes?



25 + 3 = 28 minutes

2 hours 28 minutes



1 mark



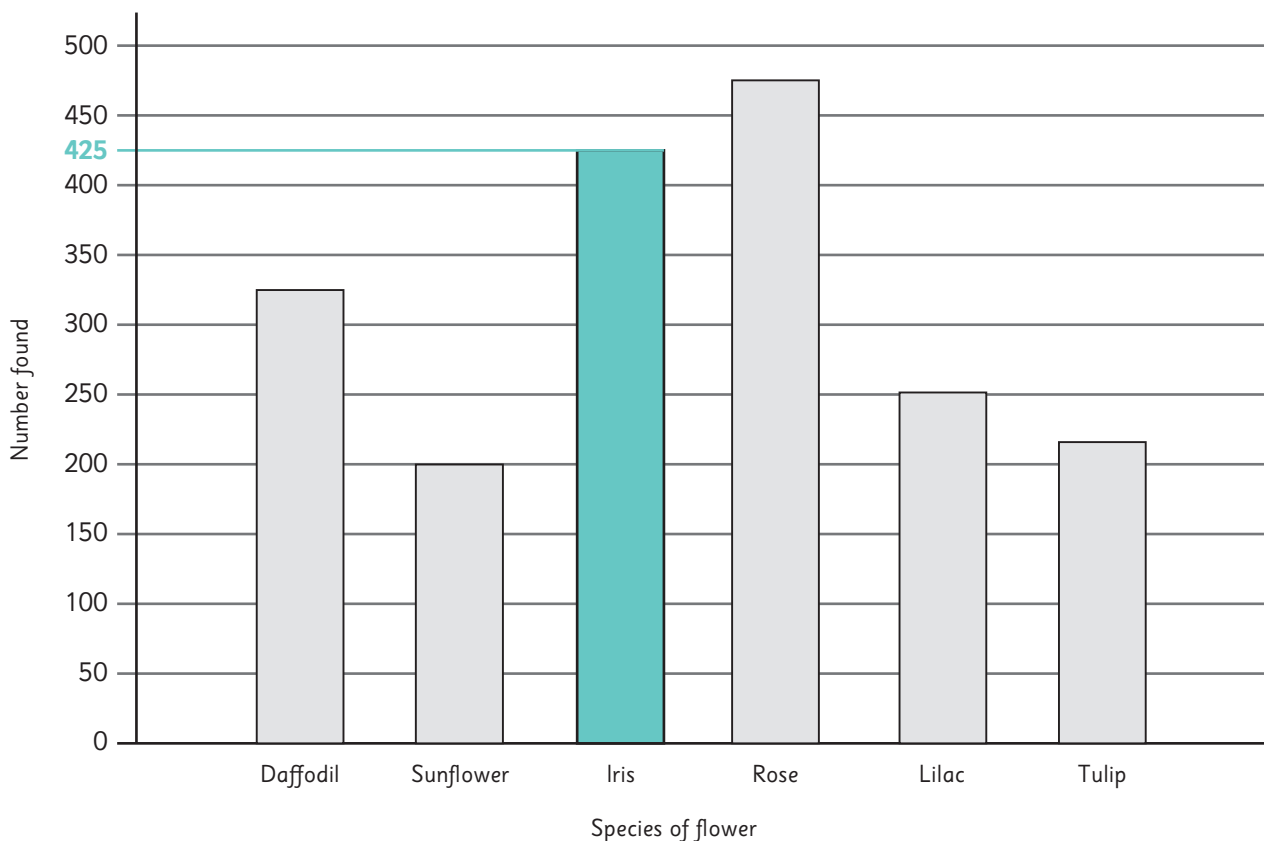
17

This table shows the number of different flower species found in a country garden.

Species of flower	Number found
Daffodil	325
Sunflower	200
Iris	425
Rose	475
Lilac	250
Tulip	210

Use the table to complete the graph.

Each interval is 50, so each half interval is 25.



1 mark



18

24 children in Year 6 were gifted books.

Inaya says,

“40% of the children were given a comedy book.”

Can Inaya be correct? Circle Yes or No.

Yes

No

Explain your answer.

10% of 24 = 2.4, so 40% of 24 = 2.4 x 4 = 9.6

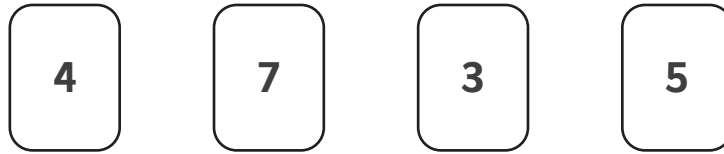
We can't have .6 of a child, so Inaya can not be correct



1 mark



Use the digit cards below to complete the calculation.



$$\square \times \square - \square = \square$$



1 mark

Some multiplications are too large for any of the other digit cards to provide the result ($5 \times 7 = 35$, $4 \times 7 = 28$, $5 \times 4 = 20$, $7 \times 3 = 21$).

So, we are left with $3 \times 5 = 15$ or $3 \times 4 = 12$.

$$3 \times 5 = 15$$

$$15 - 7 = 8$$

$$15 - 5 = 10$$

This doesn't work.

$$3 \times 4 = 12$$

$$12 - 7 = 5$$

$$12 - 5 = 7$$

This works.

Our answer can be any of the following:

$$3 \times 4 - 7 = 5$$

$$3 \times 4 - 5 = 7$$

$$4 \times 3 - 7 = 5$$

$$4 \times 3 - 5 = 7$$



20

This table shows the favourite zoo animals of children in Year 6.

Animal	No. of children
Lion	20
Giraffe	15
Elephant	10
Gorilla	5

$$\frac{20}{50} = \frac{40}{100} = 40\% = 0.4$$

$$\frac{15}{50} = \frac{30}{100} = 30\%$$

$$\frac{10}{50} = \frac{20}{100} = 20\%$$

$$\frac{5}{50} = \frac{1}{10}$$

Total children:
50 children

Tick the statements that are correct.

20% of children like elephants best.



$\frac{1}{5}$ of children like gorillas best.



As a decimal, the proportion of children who prefer lions is 0.4.



15% of children like giraffes best.



2 marks



Match each shape to the one with **equal area**.

Count the squares. Remember $2 \times \frac{1}{2}$ squares = 1 whole square.

The shapes and their areas are as follows:

- Shape 1 (Top):** A diamond shape with a circled number 8. It covers 8 squares (4 full squares in the center and 4 half-squares on the sides). It is connected to the 4x2 rectangle.
- Shape 2 (Second):** A larger diamond shape with a circled number 12. It covers 12 squares (6 full squares in the center and 6 half-squares on the sides). It is connected to the 4x3 rectangle.
- Shape 3 (Third):** A small house-like shape with a circled number 4. It covers 4 squares (2 full squares in the center and 2 half-squares on the sides). It is connected to the 2x2 rectangle.
- Shape 4 (Bottom):** A shape with a circled number 6. It covers 6 squares (3 full squares in the center and 3 half-squares on the sides). It is connected to the 3x2 rectangle.

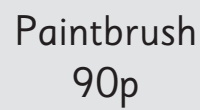
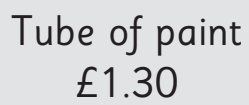
The rectangles and their areas are as follows:

- Rectangle 1:** 2x2 grid, labeled 4.
- Rectangle 2:** 2x3 grid, labeled 6.
- Rectangle 3:** 2x4 grid, labeled 8.
- Rectangle 4:** 3x2 grid, labeled 12.



1 mark


James is given some pocket money.



He has one-quarter of his money left.

Show
your
method

[illegible]

 grammarsaurus.co.uk

When **$x = 8$** , what is the value of each expression below?

Substitute the number 8 for the letter x in each expression.

$8 + 23 = 31$

$x + 23$

 $=$ **31**

$8 - 5 = 3$

$x - 5$

 $=$ **3**

$3 \times 8 = 24$

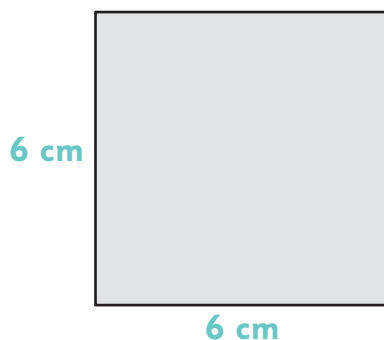
$3x$

 $=$ **24****2 marks**

24

The area of a square is 36 cm^2 .

$$6 \times 6 = 36$$

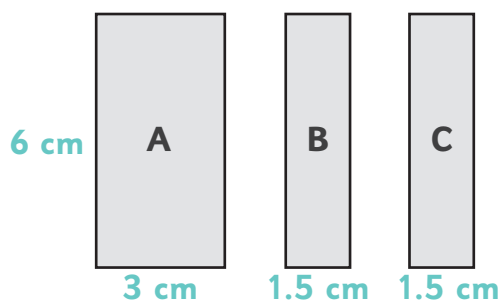


The square is cut into 3 rectangles.

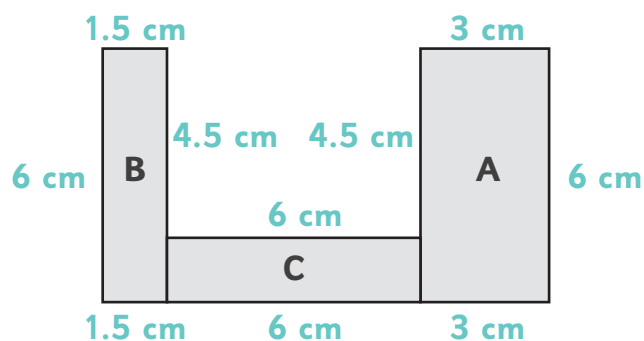
Rectangle **B** and **C** have an area **half** the size of rectangle **A**.

$$6 \div 2 = 3$$

$$3 \div 2 = 1.5$$



Rectangles **A**, **B** and **C** are used to make a new shape.



Calculate the **perimeter** of the shape.

Show
your
method

$$6 + 6 + 6 + 6 + 1.5 + 1.5 + 4.5 + 4.5 + 3 + 3 =$$

$$(6 + 6 + 6 + 6) + (1.5 + 1.5) + (4.5 + 4.5) + (3 + 3) =$$

$$24 + 3 + 9 + 6 = 27 + 15 = 42$$

42 cm

2 marks

