2019 national curriculum tests

Key stage 2

Mathematics

Paper 2: reasoning

First name						
Middle name						
Last name						
Date of birth	Day		Month		Year	
School name						
DfE number						

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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.

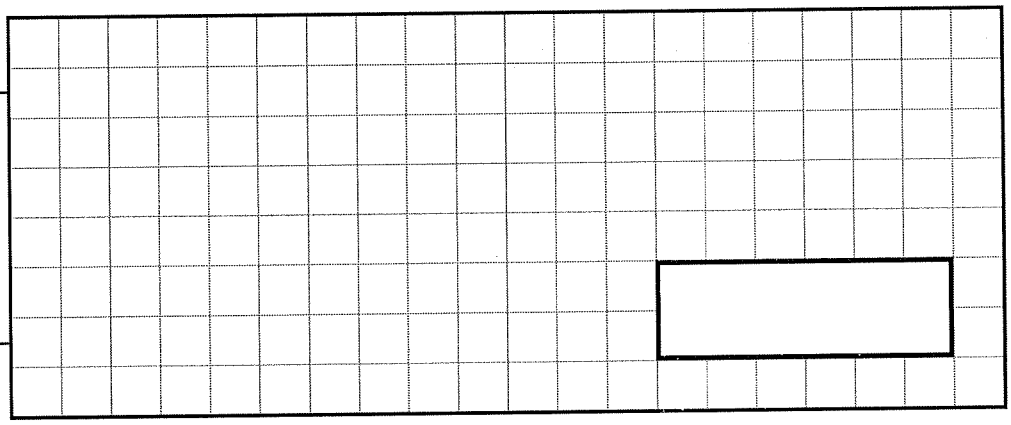
Follow the instructions for each question.

Work as quickly and as carefully as you can.

If you need to do working out, you can use the space around the question.
Do not write over any barcodes.

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 line at the side of the page tells you the number of marks available for each question.

1 In this grid, there are four multiplications.

Write the **three** missing numbers.

4
8
12

4	×	8	=	32
×		×		
3	×	7	=	21
=		=		
12		56		

8
16
24
32
40
48
56

1 mark

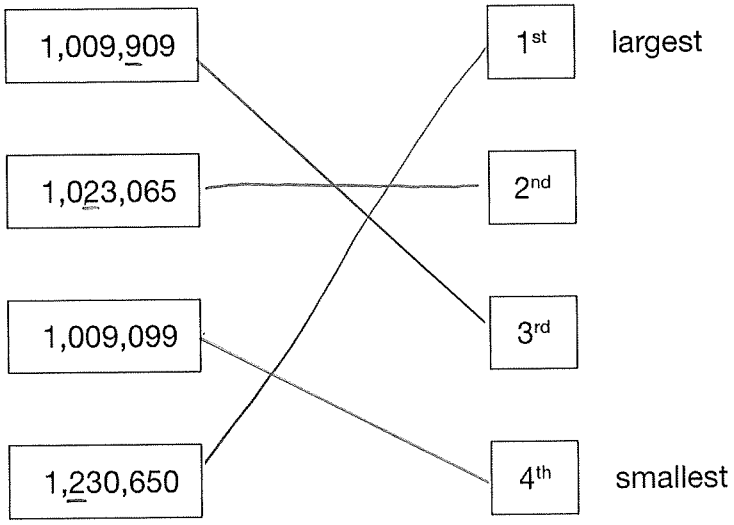
2 What number is 1,000 **less** than 9,072?

$$\begin{array}{r} 9072 \\ -\ 1000 \\ \hline 8072 \end{array}$$

8072

1 mark

3 Order the numbers starting with the **largest**.
Match each number with its order.

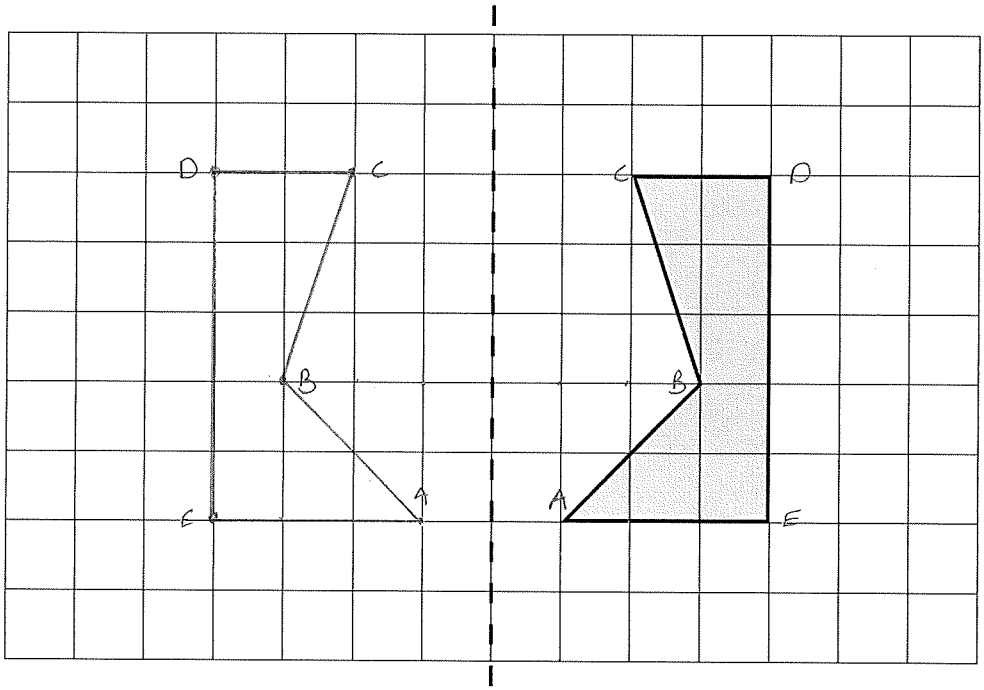


1 mark

4 Here is a shaded shape on a square grid.

Reflect the shape in the mirror line.

Use a ruler.



mirror line

1 mark

5 The numbers in this sequence **increase** by 45 each time.

Write the missing numbers.

110	155	200	245	290	335

2 marks

155 − 45 = 110

245 + 45 = 290

290 + 45 = 335

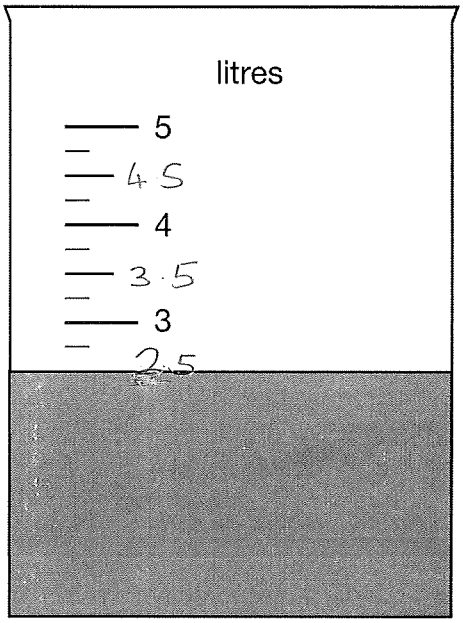
6 Write the missing number to make this **division** correct.

$0.3 \div$ 10 $= 0.03$

1 mark

0.3 → 1 place = ÷ 10

7 Jack pours some dark paint into a container.



In litres, how much paint is in the container?

2.5 **litres**

1 mark

8 In this sequence, the rule to get the next number is

Multiply by 2, and then add 3

Write the missing numbers.

1 mark

11	25	53	109

1 mark

$25 - 3 = 22$

$22 \div 2 = 11$

$53 \times 2 = 106$

$106 + 3 = 109$

9 Jack chose a number.

He multiplied the number by 7

Then he added 85

His answer was 953

What number did Jack choose?

Show your method

$$\begin{array}{r} 8\,^{1}4 \\ 9\,^{1}5\,^{2}3 \\ -\quad 8\,5 \\ \hline 8\,6\,8 \end{array} \qquad 7\overline{)8\,^{1}6\,^{2}8} \quad 1\,2\,4$$

124

2 marks

10 A theme park sells tickets online.

Each ticket costs £24

There is a £3 charge for buying tickets.

Which of these shows how to calculate the total cost, in pounds?

Tick **one**.

number of tickets × 3 + 24 ☐

number of tickets × 24 + 3 ☑

number of tickets + 3 × 24 ☐

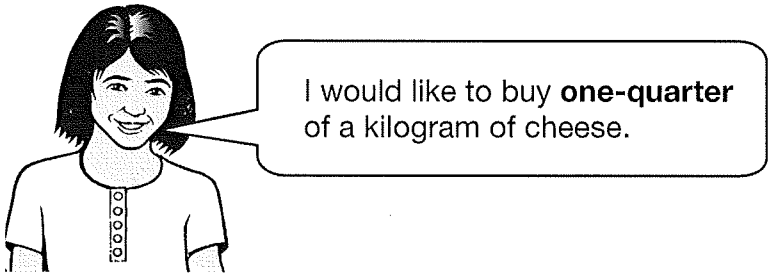
number of tickets + 24 × 3 ☐

n × 24 + 3

1 mark

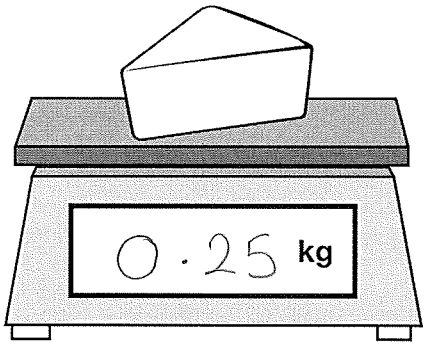
11 Amina is shopping.

She says,



Write one-quarter on the scales as a decimal.

$\frac{1}{4} = 0.25$



1 mark

The cheese costs £1.35

Amina pays with a £2 coin.

How much change should Amina get?

$$\begin{array}{r} {}^{1}\cancel{2}{}^{9}.{}^{1}\cancel{0}0 \\ -\ 1.35 \\ \hline 0.65 \end{array}$$

65p

1 mark

12 Here are three symbols.

$<$ $>$ $=$

Write one symbol in each box to make the statements correct.

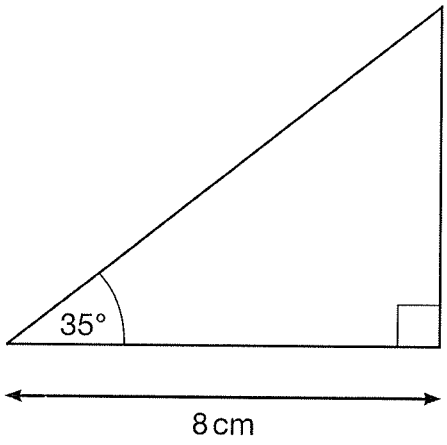
0.7 $\frac{7}{10}$ $\boxed{>}$ 0.07 $\frac{7}{100}$

$\frac{23}{1000}$ $\boxed{<}$ 0.23 $\frac{23}{100}$

1 mark

13 Here is a sketch of a triangle.

It is not drawn to scale.

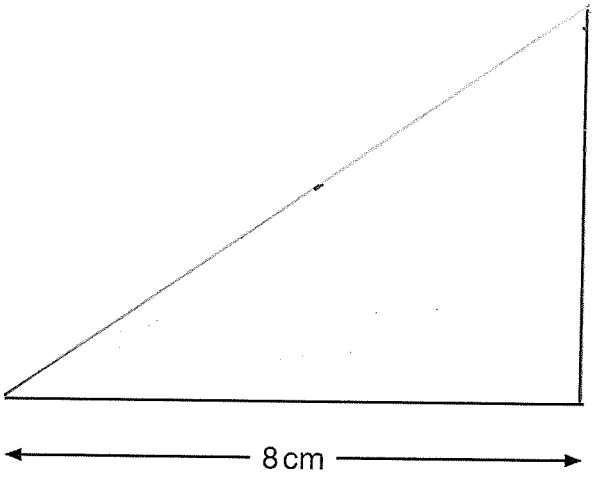


Not to scale

Draw the full-size triangle **accurately** below.

Use an angle measurer (protractor) and a ruler.

One line has been drawn for you.



2 marks

14 Complete the table.

	Round 39,476
to the nearest 10,000	40 000
to the nearest 1,000	39 000
to the nearest 100	39 500

39 476

39 476

39 476

2 marks

15 Amina asked 60 children to choose their favourite flavour of jelly.

These were her results.

Flavour	Number of children
Raspberry	12
Lemon	8
Orange	15
Blackcurrant	25
Total	**60**

What **percentage** of the 60 children chose orange?

$\frac{15}{60} = \frac{1}{4} = 25\%$

25 %

1 mark

16 Write the missing number.

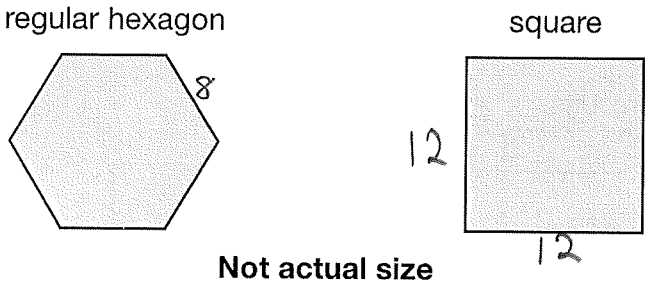
BODMAS

$6 + (2 \times 2) - \boxed{4} = 6$

$6 + 4 - 4 = 6$

1 mark

17 These two shapes have the **same** perimeter.



Not actual size

The length of each side of the **hexagon** is **8** centimetres.

Calculate the **area** of the **square.**

Show your method

$8 \times 6 = 48$

12×12

$24 + 120 = 144$

144 cm²

2 marks

18 Circle the **prime** number.

95 (89) 87

Explain how you know the other numbers are **not** prime.

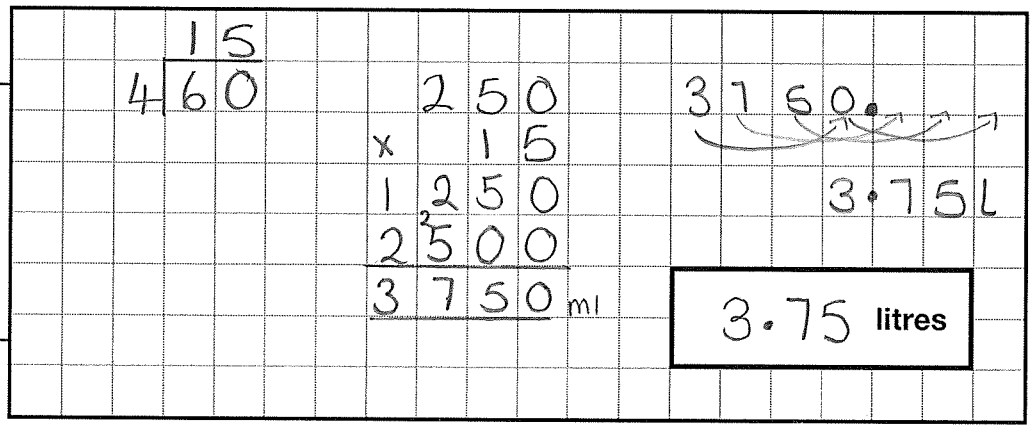
95 is a multiple of 5
so has a factor of 5
87 is divisible by 3 so has
a factor of 3
Prime numbers only have 2 factors

1 mark

19 A machine pours 250 millilitres of juice every 4 seconds.

How many **litres** of juice does the machine pour every **minute**?

Show your method



2 marks

20 Tick the fractions that are **equal** to 20%.

$\frac{1}{20}$ ☐

$\frac{20}{40}$ ☐

$\frac{1}{5}$ ☑

$\frac{1}{5}$ $\frac{3}{15}$ ☑

$\frac{2}{100}$ ☐

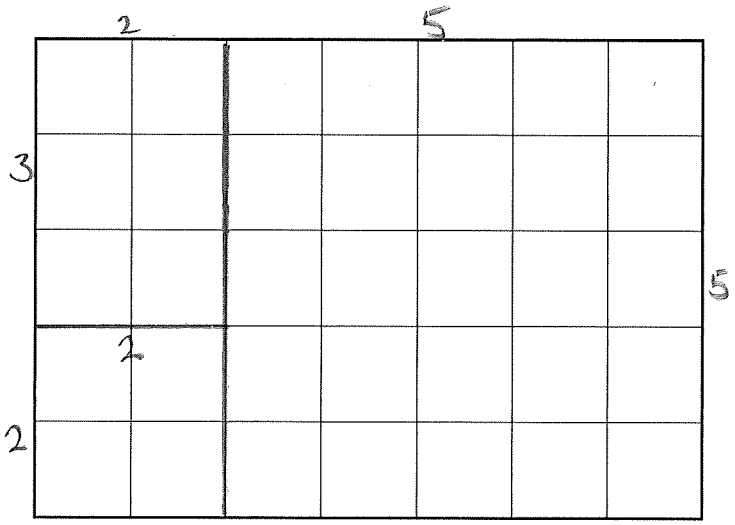
20% = $\frac{20}{100}$

$\frac{2}{10}$ $\frac{1}{5}$ $\frac{4}{20}$ $\frac{8}{40}$

$\frac{3}{15}$

2 marks

21 Adam has this rectangular piece of card. It is marked with grid lines.



1 mark

Adam makes two straight cuts along the grid lines.

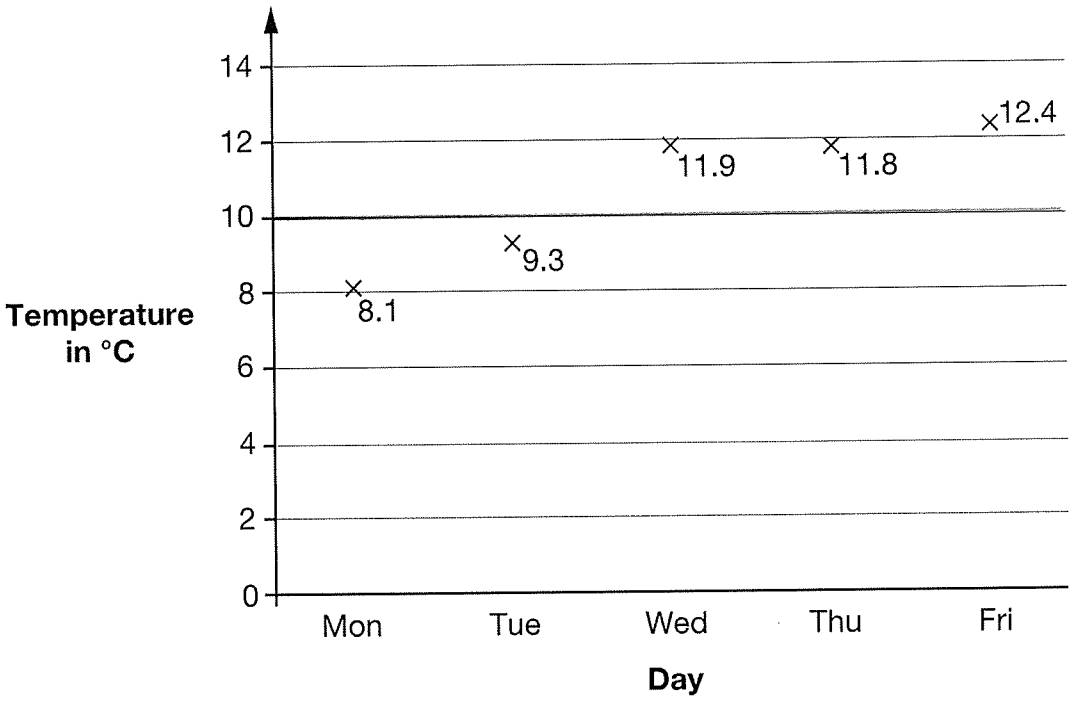
The two cuts divide the rectangle into 3 shapes:

- 2 squares of **different** size, and
- 1 rectangle.

Using the grid lines, draw **two** lines that show where Adam could have made his cuts.

Use a ruler.

22 This graph shows the maximum temperature for five days.



For what fraction of the five days was the maximum temperature below 10 °C?

$\frac{2}{5}$

$\frac{2}{5}$

1 mark

What was the **mean** maximum temperature, to one decimal place?

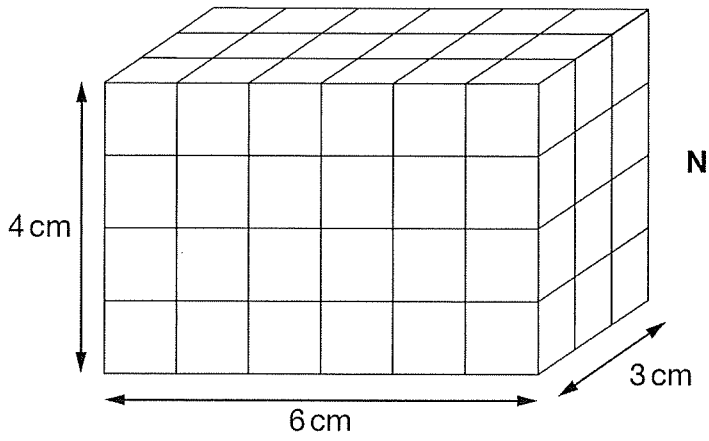
Show your method

12.4
11.8
11.9
9.3
+ 8.1
53.5

10.7 °C

2 marks

23 Amina made this cuboid using centimetre cubes.



Not actual size

Stefan makes a cuboid that is 5 cm longer, 5 cm taller and 5 cm wider than Amina's cuboid.

What is the **difference** between the number of cubes in Amina's and Stefan's cuboids?

Show your method

$3 \times 4 \times 6 = 72$

$11 \times 9 \times 8 = 792$

$792 - 72 = 720$

99
× 8
792
7

720 **cubes**

2 marks

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Standards & Testing Agency

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Paper 2: reasoning
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