

**2022 national curriculum tests**

# Key stage 2

## Mathematics

### Paper 3: reasoning

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



K 0 0 0 8 0 A 0 1 2 4

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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**.

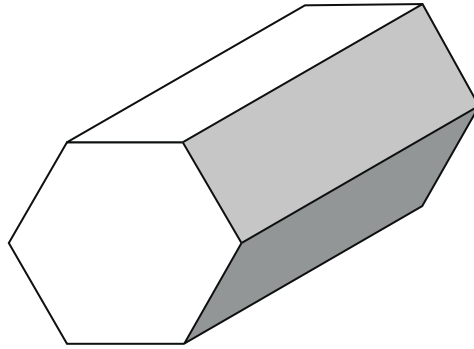
### Marks

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



1

Here is a drawing of a hexagonal prism.



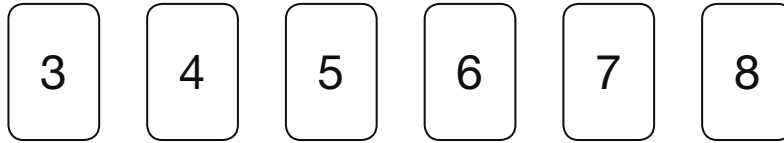
How many **faces** does the prism have?

1 mark



2

Here are six number cards.

Use **all six** cards to complete the three multiplications below.

$$24 = \square \times \square$$

$$28 = \square \times \square$$

$$30 = \square \times \square$$

---

1 mark

3

Olivia buys a banana, an apple and a bag of nuts.



**30p**



**45p**



**60p**

She pays with three 50p coins.

What is her change?

Show  
your  
method

A diagram showing a horizontal line with a point labeled 'p' on the right side.

2 marks



4

Draw **four** lines to match each fraction to its equivalent decimal.

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

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

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

$$\frac{3}{100}$$

0.3

0.5

0.8

0.03

0.25

0.75

---

2 marks

K 0 0 0 8 0 A 0 7 2 4

5

Some children vote for their favourite ice-cream flavour.

Ice-cream flavour	Number of children
vanilla	87
chocolate	154
strawberry	?
mint	38
<b>Total</b>	<b>402</b>

How many children vote for **strawberry**?

Show  
your  
method

**children**

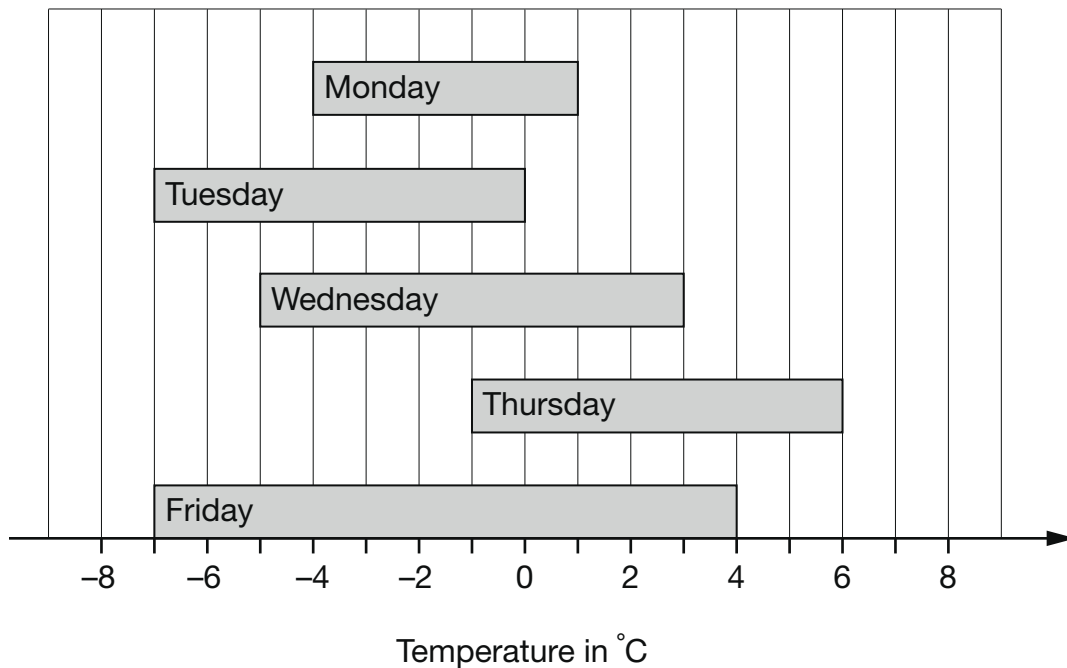
2 marks





6

This chart shows the range of temperatures each day during one week from Monday to Friday.



What was the **lowest** temperature?

°C

1 mark

What was the difference between the highest and lowest temperatures on **Wednesday**?

°C

1 mark



K 0 0 0 8 0 A 0 9 2 4

**7**

One Saturday afternoon, a total of 234,869 people attended three rugby matches.

- 80,978 people attended match 1
- 72,319 people attended match 2

How many people attended match 3?

Show  
your  
method

2 marks



8

7,546

Round this number:

to the nearest 1,000

to the nearest 100

to the nearest 10

2 marks

9

Complete the calculation.

$$1,000 \times 416 = 10 \times$$

1 mark





Show  
your  
method

A blank grid with a thick black rectangle on the right side. The grid is composed of 20 columns and 10 rows. A thick black rectangle is positioned on the right side, spanning 5 columns and 2 rows, starting from the 16th column and the 8th row.

Page 12 of 24



**11**

Ally chooses a whole number.

When she multiplies her number by **4**, the answer is **less than 100**

When she multiplies her number by **5**, the answer is **greater than 100**

Write a number that Ally could have started with.

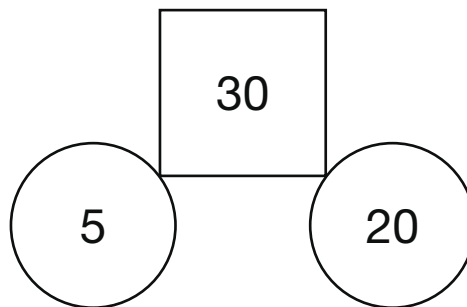
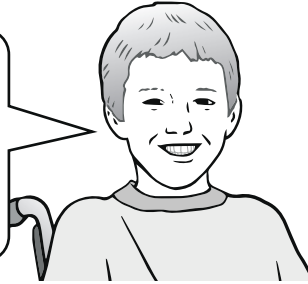
1 mark



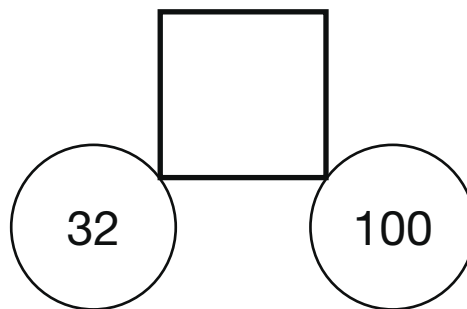
12

William says the rule for this diagram.

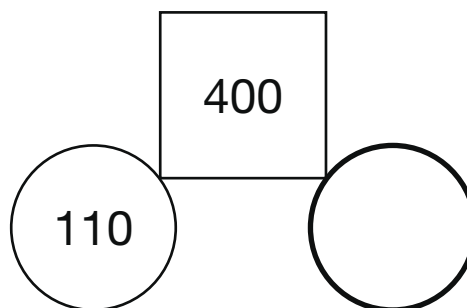
Find the difference between  
the numbers in the circles.  
  
Double this to make the  
number in the square.



Use the same rule to write the missing numbers below.



1 mark



1 mark



13

Write the missing fraction to make this **addition** correct.

$$\frac{2}{3} + \boxed{\phantom{000}} = \frac{5}{6}$$

1 mark

14

Jack hires a hall for a party.

This formula is used to work out the total cost.

**Total cost = £15 booking fee + £12.50 per hour**

What is the total cost of hiring the hall from 6pm until 11pm?

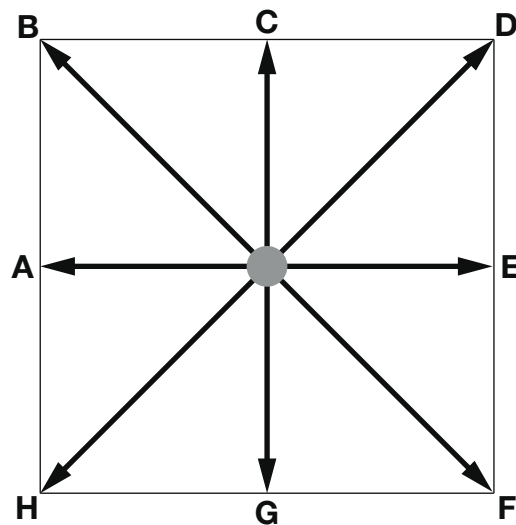
£

1 mark



15

Stefan stands in the centre of this square.



Not actual size

Stefan is facing towards **F**.

He turns **anti-clockwise** to face **D**.

What **angle** does Stefan turn through?

degrees

1 mark

Stefan is now facing towards **D**.

He turns **3 right angles clockwise**.

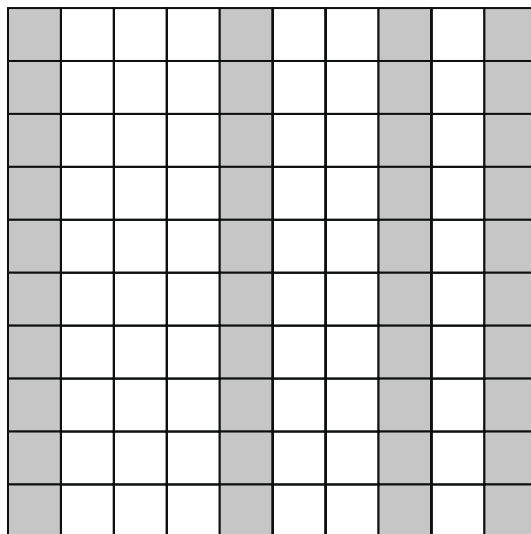
Write the **letter** he faces after the turn.

1 mark





16

Part of this  $10 \times 10$  grid is shaded.

Tick the fractions that represent the shaded part of the grid.

$\frac{1}{4}$  ☐

$\frac{2}{5}$  ☐

$\frac{4}{10}$  ☐

$\frac{6}{10}$  ☐

$\frac{40}{100}$  ☐

2 marks



height



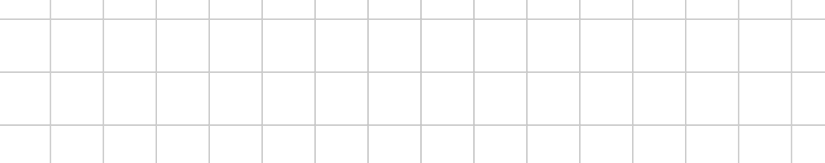
She uses straws that are 7.5 cm long for the height.

She uses straws that are 11 cm long for the length.

She uses straws that are 8.5 cm long for the width.

What is the **total** length of all the straws in her model?

Show  
your  
method

A blank grid with a 1 cm scale bar. The grid is composed of small squares. A scale bar is located in the bottom right corner, consisting of a horizontal rectangle with the label "1 cm" inside it.

cm

2 marks





The price is reduced by 30%.

What is the **reduced price**?

Show  
your  
method

£

2 marks



19

Jack says,

When you square a prime number, the answer has only two factors.



Explain why Jack is **not** correct.

A large, empty, cloud-shaped outline with a scalloped border, intended for the student to write their explanation.

1 mark



**20**

This table shows how many people finished the New York Marathon in each of the first four decades it was held.

New York Marathon	
Decade	Total number of people who finished
1st decade	24,863
2nd decade	170,932
3rd decade	282,420
4th decade	350,824

What is the mean number of people who finished the marathon per decade? Round your answer to the **nearest hundred**.

Show  
your  
method

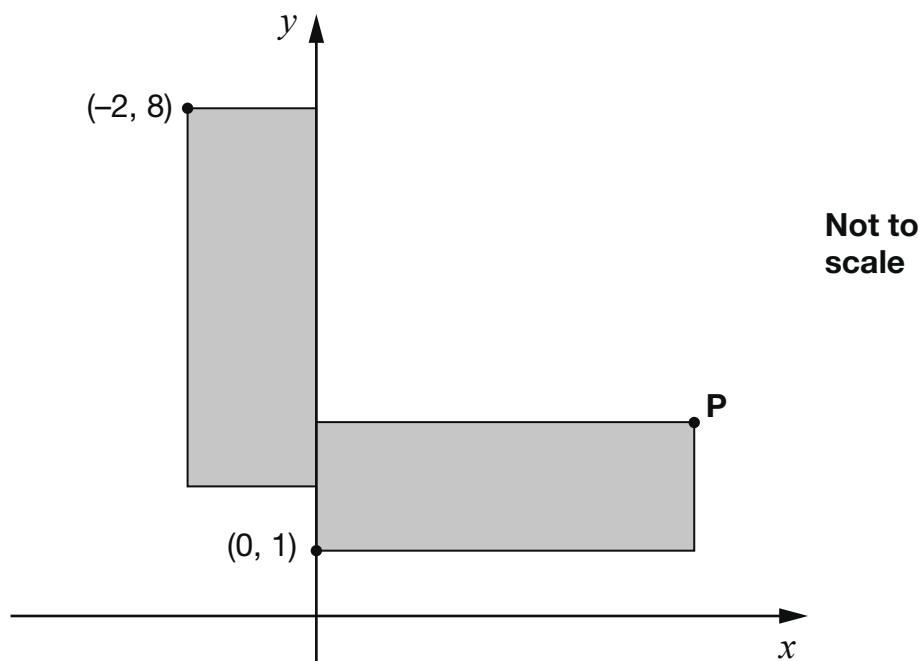
3 marks



**21**

These two rectangles are identical.

The length of each rectangle is **three times** its width.



What are the coordinates of point **P**?

(      ,      )
-----------------

1 mark



**[END OF TEST]**

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2022 key stage 2 mathematics

Paper 3: reasoning

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