

2024 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						



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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:**

The diagram illustrates a 'method box' used in the test. It features a large grid area for working out. On the left side of the grid, there is a rounded rectangular label that says 'Show your method'. To the right of the grid, there is a smaller, empty rectangular box, likely intended for the final answer.

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.

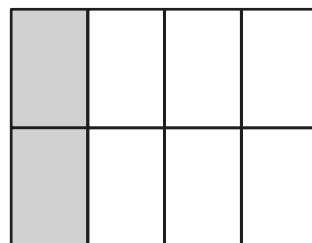
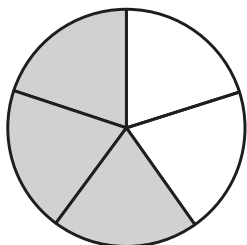
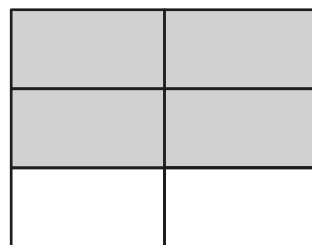
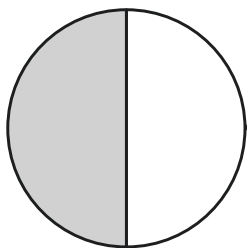
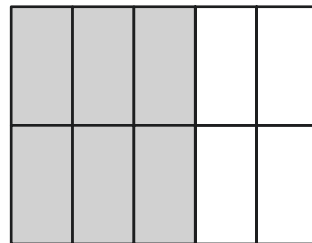
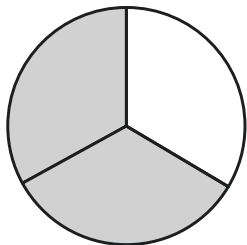
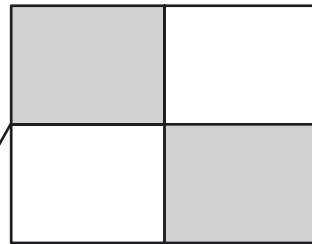
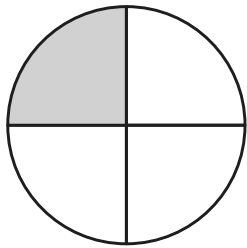


1

These shapes have a fraction shaded.

Match each shaded fraction of a circle to the same shaded fraction of a rectangle.

One has been done for you.



1 mark



2

The temperature in a freezer is  $-40^{\circ}\text{C}$ .

The temperature increases by  $10^{\circ}\text{C}$ .

What is the new temperature?

 $^{\circ}\text{C}$ 

---

1 mark

M 0 0 0 8 0 A 0 5 2 4



4

The diameter of the Moon is 3,476 kilometres.

What is this diameter to the **nearest hundred** kilometres?

km

---

 1 mark

5

Match each of these Roman numerals to the correct number.

One has been done for you.

CVI		1110
DXC	106	590
DLXXI	571	
MCX		

---

 1 mark


6

Match each fraction to its equivalent simplified fraction.

One has been done for you.

Fraction	Simplified fraction
$\frac{12}{20}$	$\frac{4}{5}$
$\frac{12}{15}$	$\frac{2}{3}$
$\frac{12}{16}$	$\frac{3}{5}$
$\frac{12}{18}$	$\frac{3}{4}$

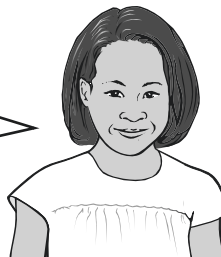
1 mark



7

Emma thinks of a number. She says,

I multiply by 2  
I add 11  
I divide by 3  
My answer is 9



What number did Emma think of?

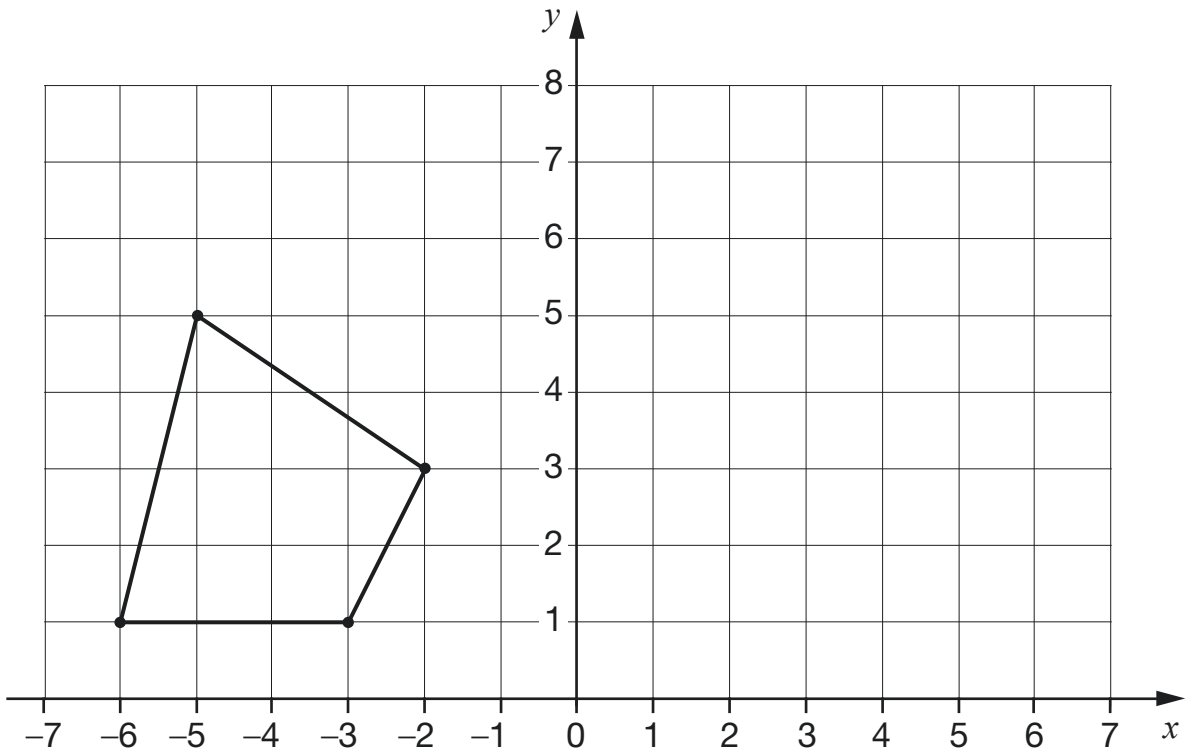
1 mark



8

Here is a shape.

Draw the shape after it is translated 8 units to the right.



1 mark

Use a ruler.



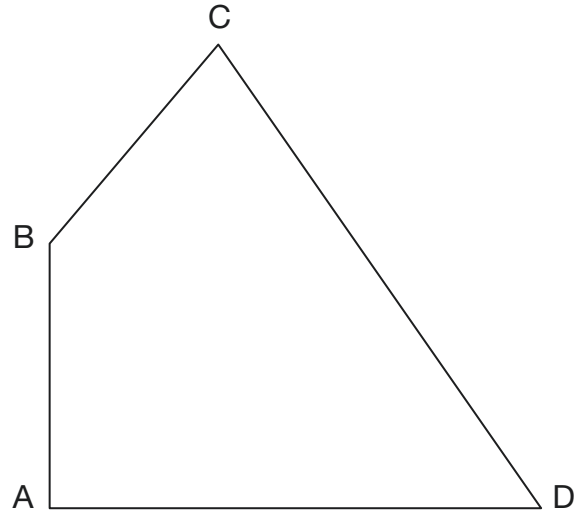
9

Write the missing numbers in the table.

Number of weeks	Number of days
1	7
2	14
4	28
6	
10	
	105

1 mark

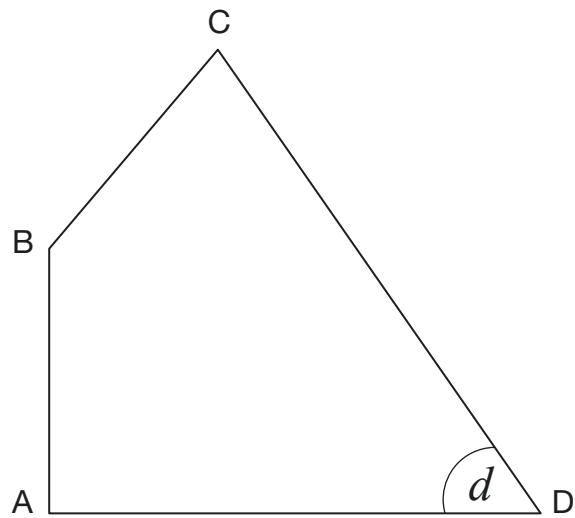
10



What is the perimeter of the shape, **in millimetres**?

Use a ruler.

1 mark



Measure the size of angle  $d$ .

Use an angle measurer.

$d$  is

1 mark



11

Write the missing digits to make this **subtraction** correct.

$$\begin{array}{r}
 57\boxed{\phantom{0}} \\
 - 3\boxed{\phantom{0}}5 \\
 \hline
 \boxed{\phantom{0}}68
 \end{array}$$

2 marks

12

Here are four fractions.

$$\frac{7}{8}$$

$$\frac{1}{5}$$

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

$$\frac{8}{10}$$

Write the fractions in order starting with the least.





least

1 mark

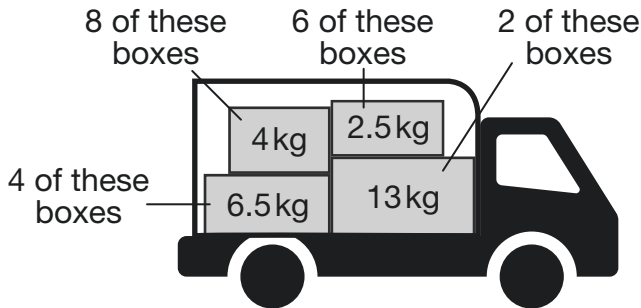


M 0 0 0 8 0 A 0 1 3 2 4

13

There are 20 boxes on a truck.

The boxes are in 4 different sizes.



What is the **total mass** of the 20 boxes on the truck?

Show your method

A large grid for showing the method. A box on the right side contains the unit 'kg'.

2 marks



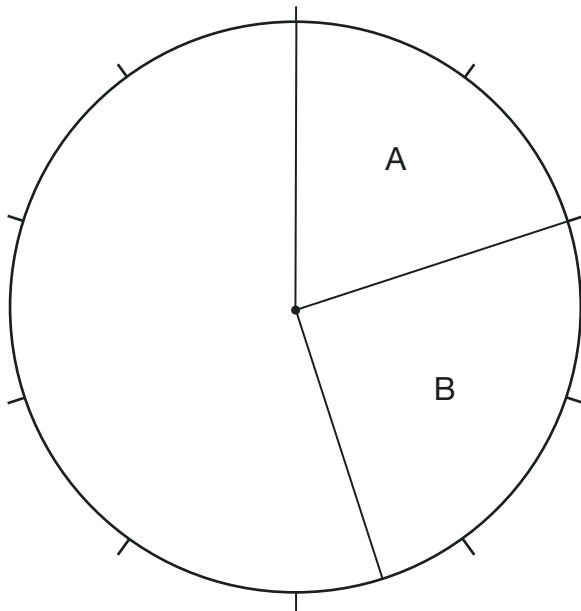
14

Look at the data in this table.

Label	Percentage
A	20%
B	25%
C	15%
D	30%
E	10%

Using this data, draw **two** lines and write **three** labels to complete the pie chart.

Use a ruler.



2 marks



**15**

35% of the 680 pupils at a school have a pet dog.

159 of the pupils who have a pet dog are boys.

How many of the pupils who have a pet dog are girls?

Show  
your  
method

The grid is 20 units wide and 10 units high. A smaller empty box is located in the bottom right corner of the grid, measuring 6 units wide and 2 units high.

2 marks





16

Write a number in the box to make this correct.

$$\frac{3}{5} < \frac{\square}{100} < 0.7$$

1 mark

17

Tick the numbers that are factors of both 54 **and** 722 3 4 8 9 

1 mark



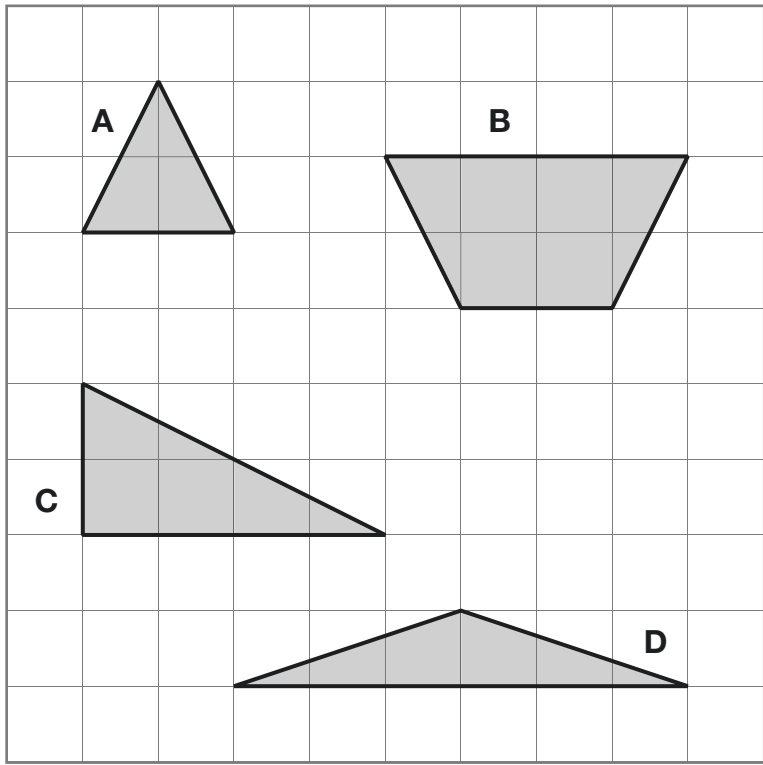


**19** Complete this division.

$$\begin{array}{r}
 \square 64 \text{ r}1 \\
 12 \overline{) 436 \square}
 \end{array}$$

2 marks

**20** Here are four shapes on a grid.



Write the letters of **all** the shapes that have **only two** acute angles.

\_\_\_\_\_ 1 mark



21

A band holds a concert for charity.

The tickets cost £27 each.

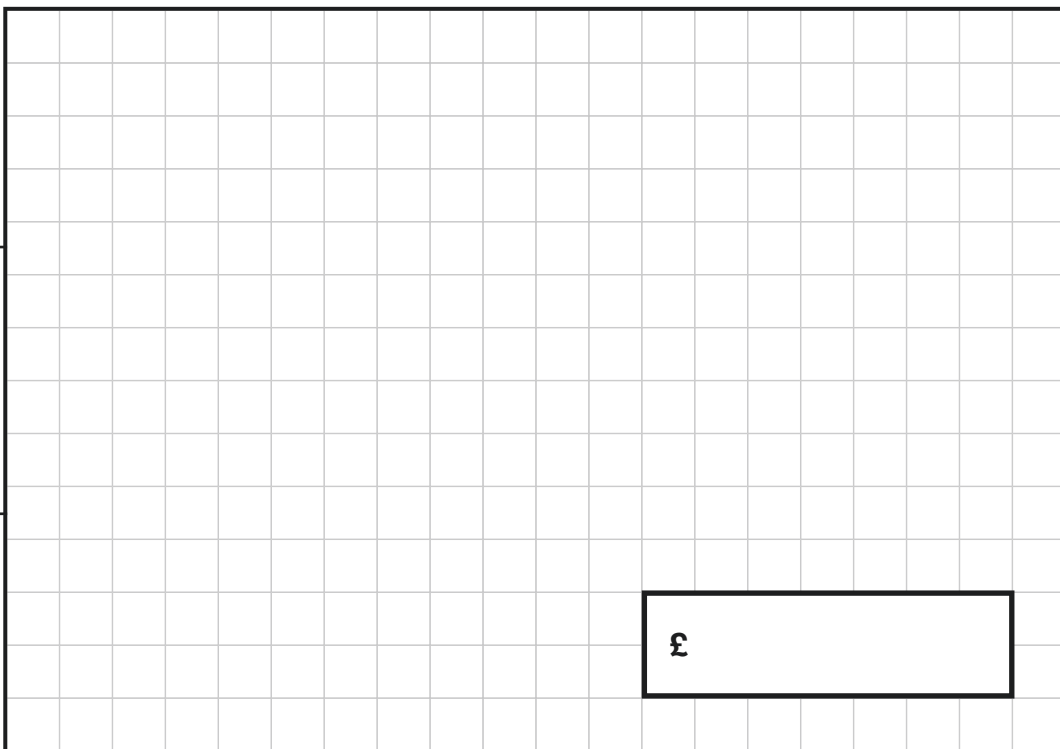
They sell 635 tickets.

They pay £3,180 to use the hall.

They give one-third of the **remaining** amount to charity.

How much money does the band give to charity?

Show  
your  
method



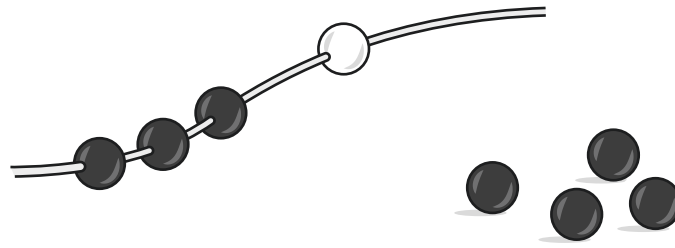
£

3 marks



22

Sarah makes jewellery using black and white beads.



She uses this rule to work out how many black beads to use.

$$\text{black} = (\text{white} \times 3) + 4$$

Sarah uses 12 **white** beads to make a necklace.

How many black beads does she use?

1 mark

Sarah uses 25 **black** beads to make a bracelet.

How many white beads does she use?

1 mark



23

Complete the table.

Name of 3-D shape	Number of faces
cube	
pentagonal prism	
triangular-based pyramid	

1 mark

24

$\frac{1}{2} \times \frac{5}{6}$  is greater than the value of  $\frac{1}{3} \times \frac{7}{8}$

Explain how you know.

1 mark



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