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:

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.
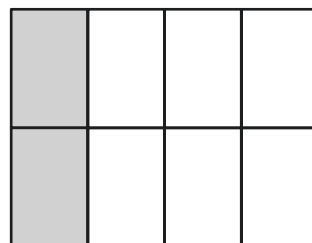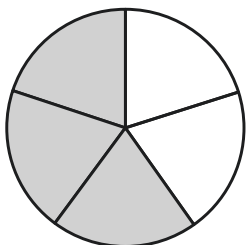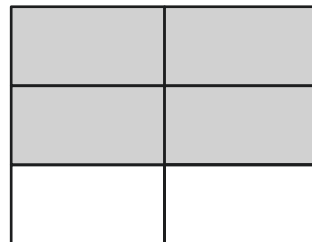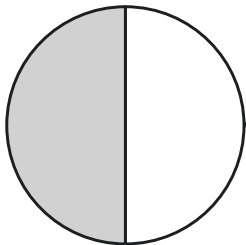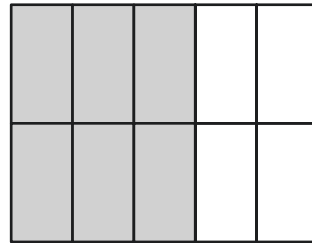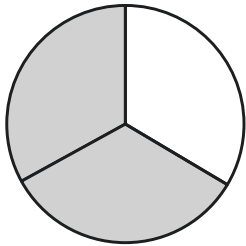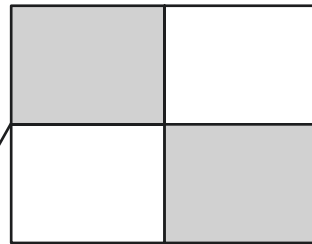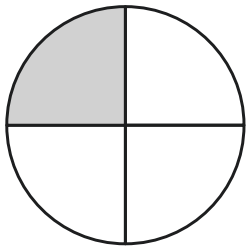
1

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 $-40\,°C$.

The temperature increases by $10\,°C$.

What is the new temperature?

	°C

1 mark

3 Jack buys milk and orange juice from a shop.

£1.45   £2.40

He pays with a £5 note.

How much **change** does Jack get?

Show your method

£

2 marks

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

DLXXI		590

MCX		571

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
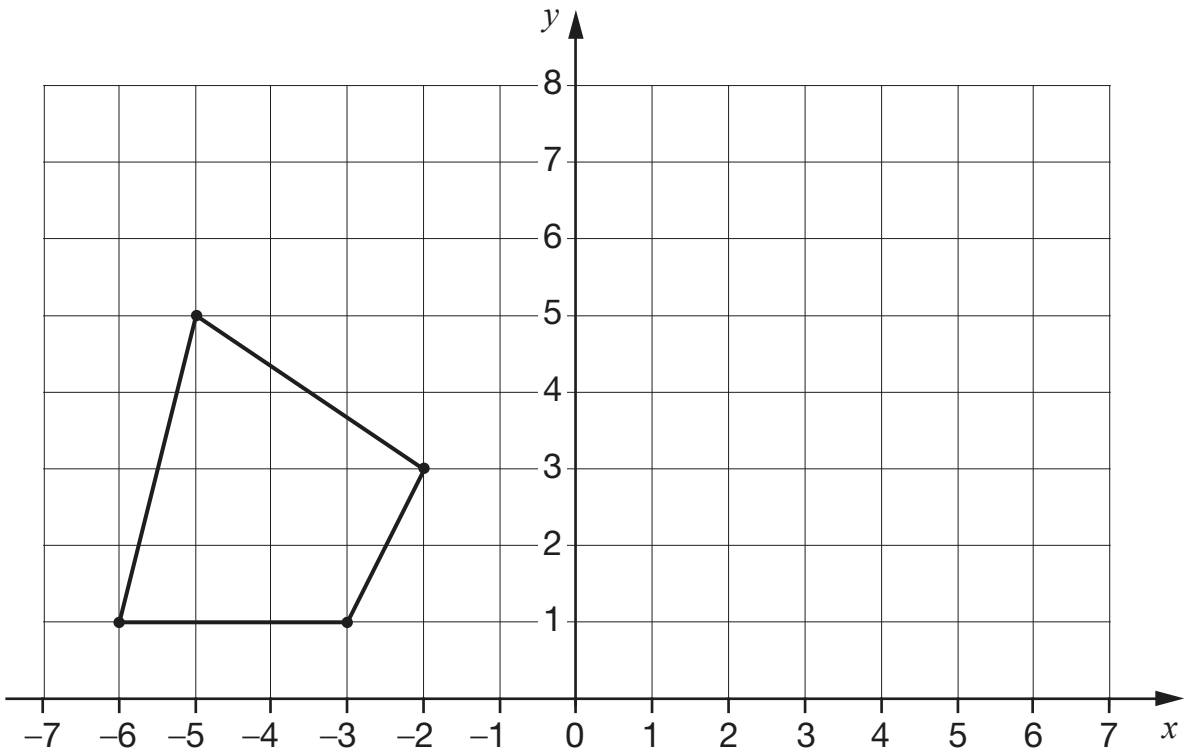
What number did Emma think of?

1 mark

8 Here is a shape.

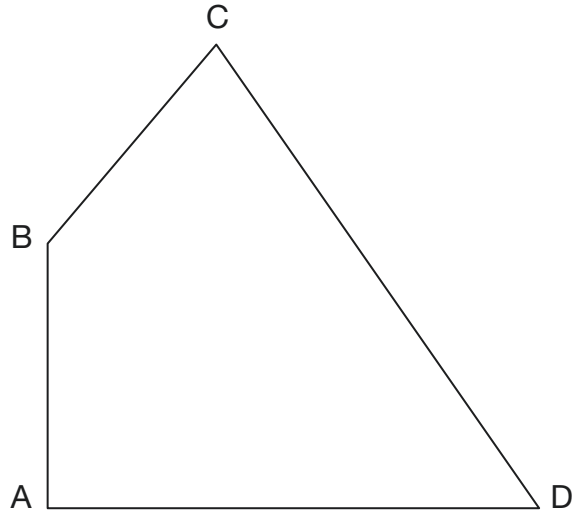Draw the shape after it is translated 8 units to the right.

Use a ruler.

1 mark

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

C

B

A
D

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

Use a ruler.

	mm

1 mark

C

B

A
d
D
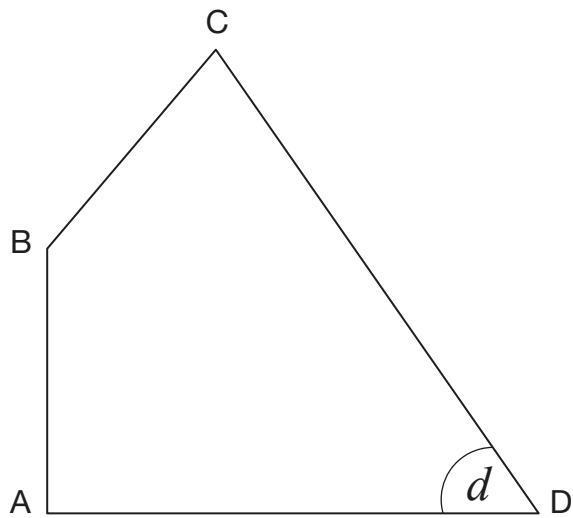
Measure the size of angle d.

Use an angle measurer.

d is | | ° |

1 mark

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

$$
\begin{array}{r}
5\quad7\quad\boxed{} \\
-\quad3\quad\boxed{}\quad5 \\
\hline
\boxed{}\quad6\quad8
\end{array}
$$

12 Here are four fractions.

$$\boxed{\dfrac{7}{8}} \qquad \boxed{\dfrac{1}{5}} \qquad \boxed{\dfrac{3}{4}} \qquad \boxed{\dfrac{8}{10}}$$

Write the fractions in order starting with the least.

$$\boxed{} \quad \boxed{} \quad \boxed{} \quad \boxed{}$$

least

13 There are 20 boxes on a truck.

The boxes are in 4 different sizes.

8 of these boxes
6 of these boxes
2 of these boxes

4 kg
2.5 kg

4 of these boxes
6.5 kg
13 kg

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

Show your method

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.
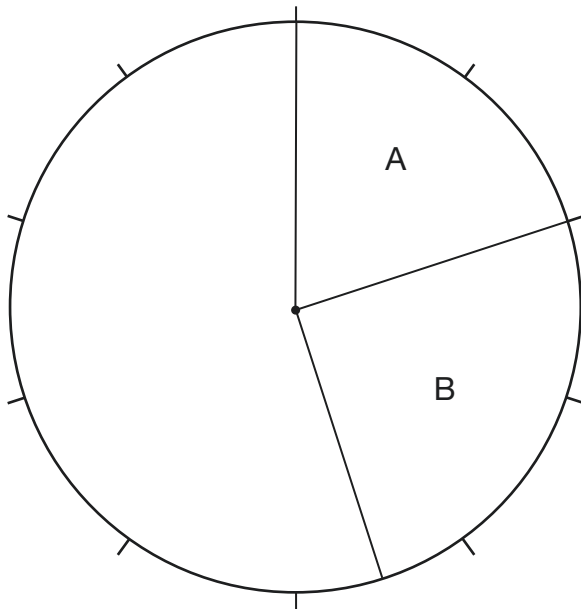
2 marks

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

2 marks

16 Write a number in the box to make this correct.

$$\frac{3}{5} \quad < \quad \frac{\boxed{}}{100} \quad < \quad 0.7$$

17 Tick the numbers that are factors of both 54 **and** 72

2 ☐

3 ☐

4 ☐

8 ☐

9 ☐

M O O O 8 O A O 1 7 2 4

18 Layla wants to buy a camera that costs £65

For the first 10 weeks, she saves £2 each week.

Then she saves £3 each week.

How many weeks **altogether** does it take Layla to save £65?

Show your method

| | weeks |

2 marks

19   Complete this division.

$$\boxed{}\,6\;\;4\;\;\text{r}\,1$$

$$1\,2\,\overline{\smash{)}\,4\;\;3\;\;6\;\;\boxed{}}$$

20   Here are four shapes on a grid.
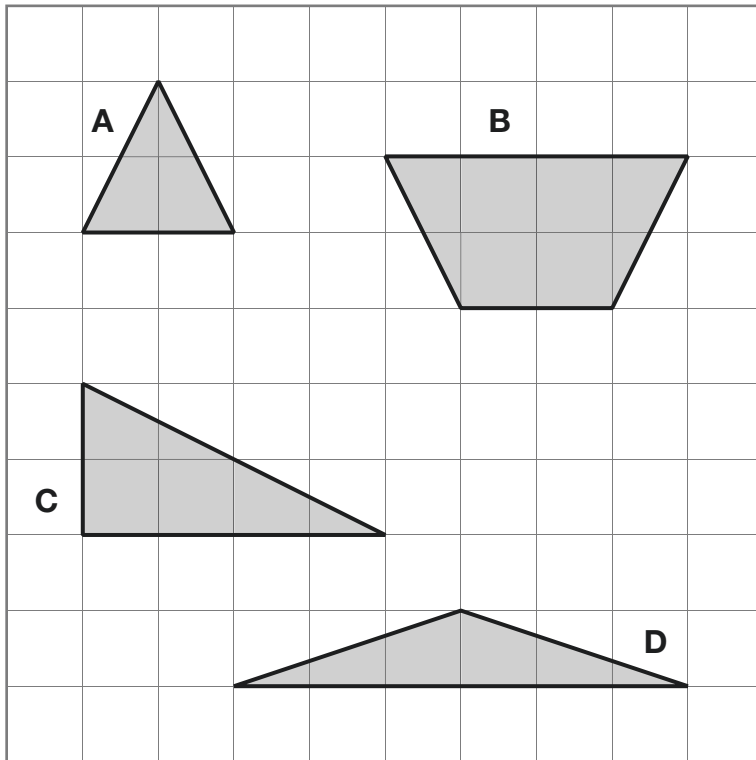
Write the letters of **all** the shapes that have **only two** acute angles.

M 0 0 0 8 0 A 0 1 9 2 4

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

M 0 0 0 8 0 A 0 2 0 2 4

22   Sarah makes jewellery using black and white beads.
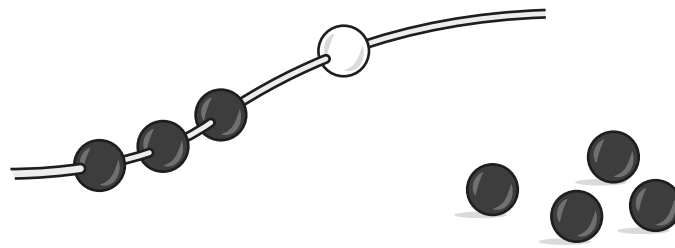
She uses this rule to work out how many black beads to use.

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

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	

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.

[END OF TEST]

Please do not write on this page.

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0300 303 3013 or email assessments@education.gov.uk.

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