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

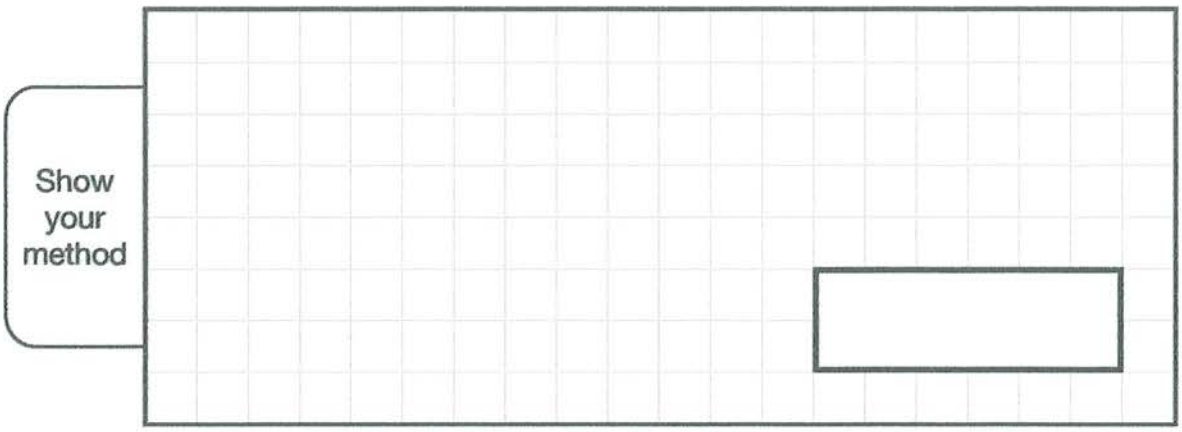
You have **40 minutes** to complete this test.

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:



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**.

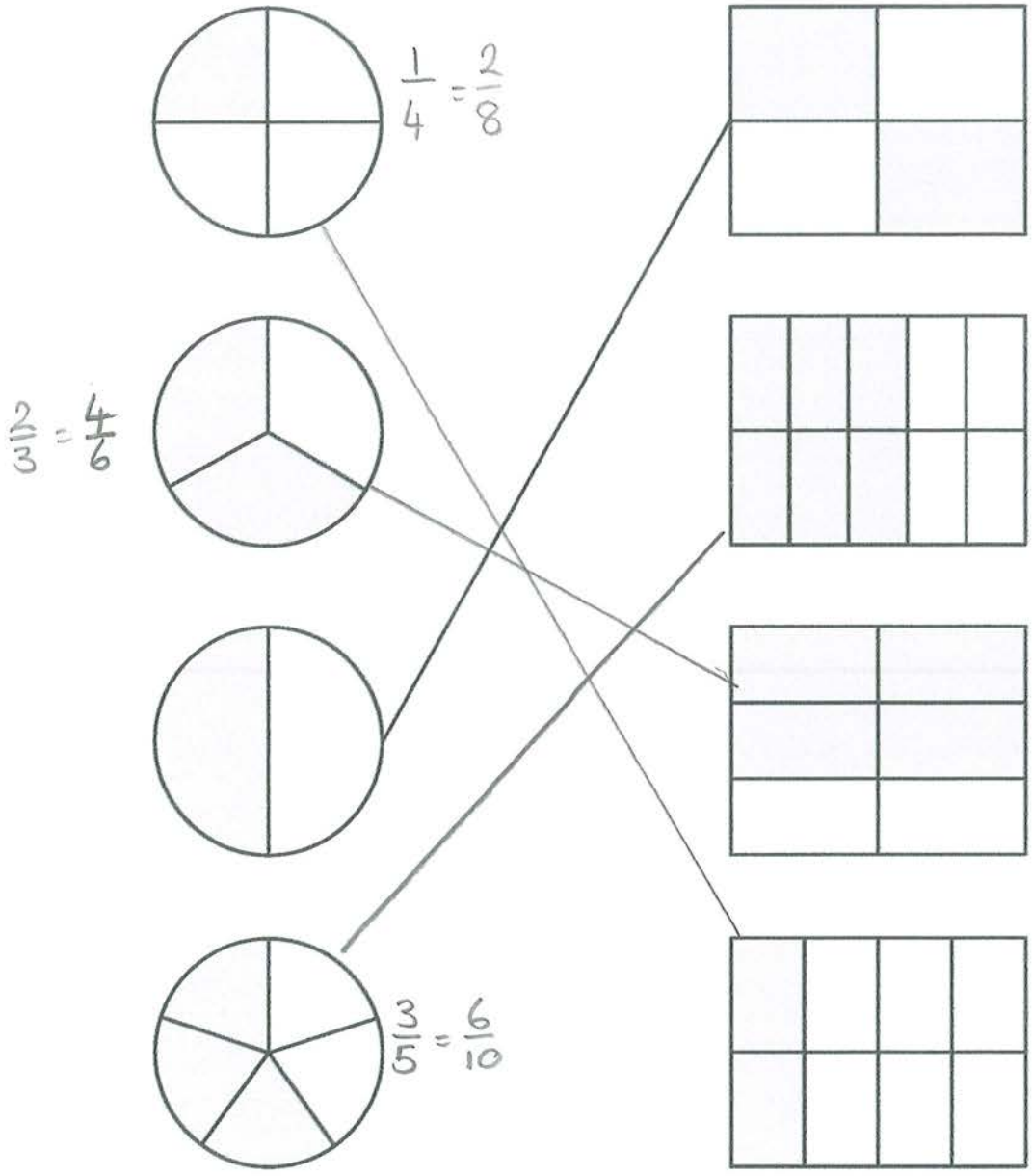
Marks

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.

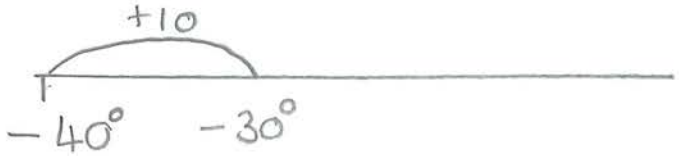


1 mark

2 The temperature in a freezer is −40 °C.

The temperature increases by 10 °C.

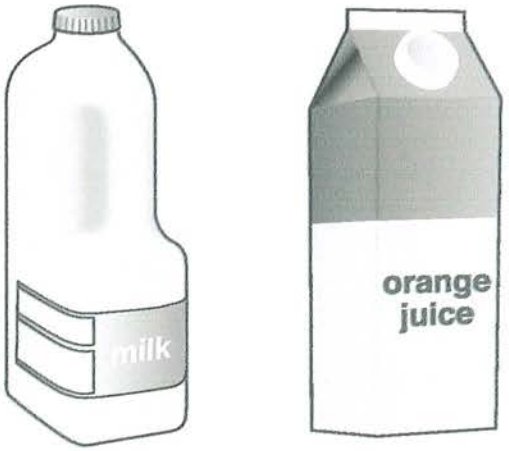
What is the new temperature?



−30 °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

$$\begin{array}{r} 1.45 \\ +\ 2.40 \\ \hline 3.85 \end{array} \qquad \begin{array}{r} \not{5}^{4}.{}^{1}\not{0}^{9}0 \\ -\ 3.85 \\ \hline 1.15 \end{array}$$

£ 1.15

2 marks

4 The diameter of the Moon is 3,476 kilometres.

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

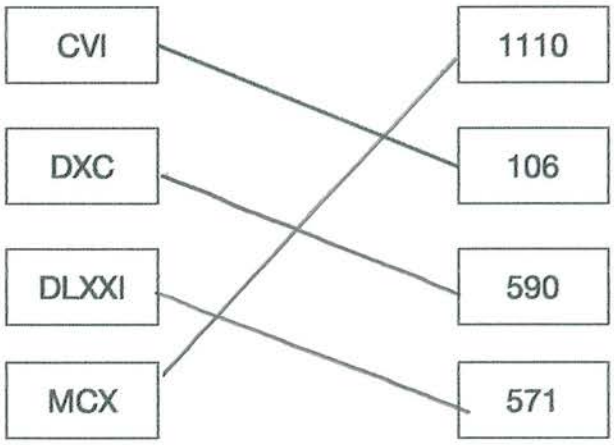
T H T U
3 4 7 6

3500 km

1 mark

5 Match each of these Roman numerals to the correct number.

One has been done for you.

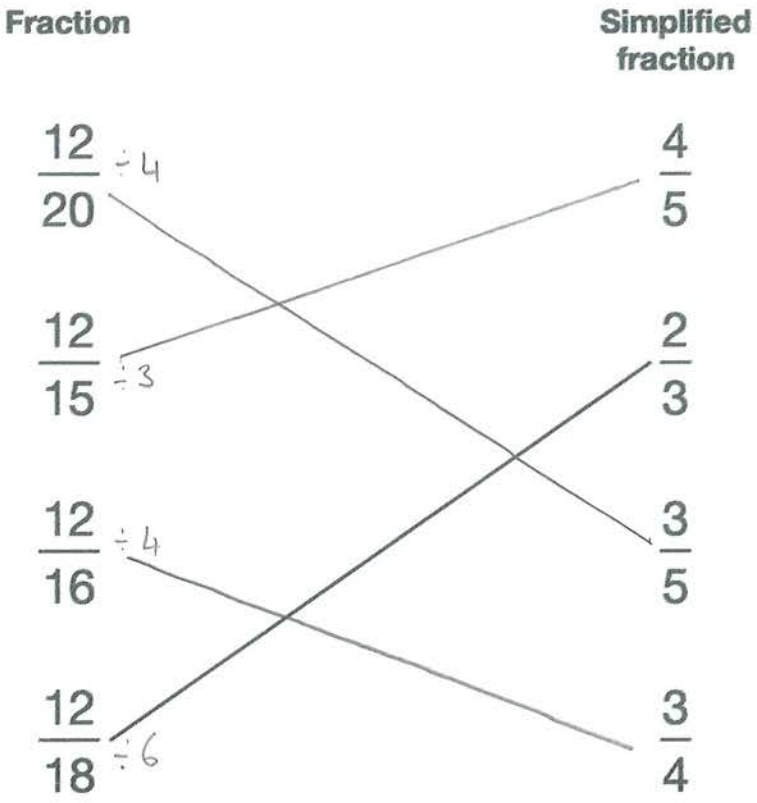


I = 1
V = 5
X = 10
L = 50
C = 100
D = 500
M = 1000

1 mark

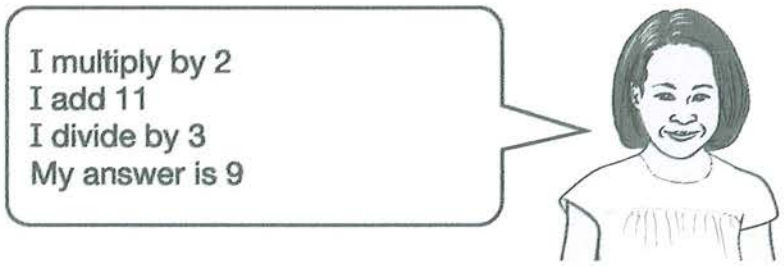
6 Match each fraction to its equivalent simplified fraction.

One has been done for you.



1 mark

7 Emma thinks of a number. She says,



What number did Emma think of?

Remember to work backwards and undo each step by doing the inverse.

8

1 mark

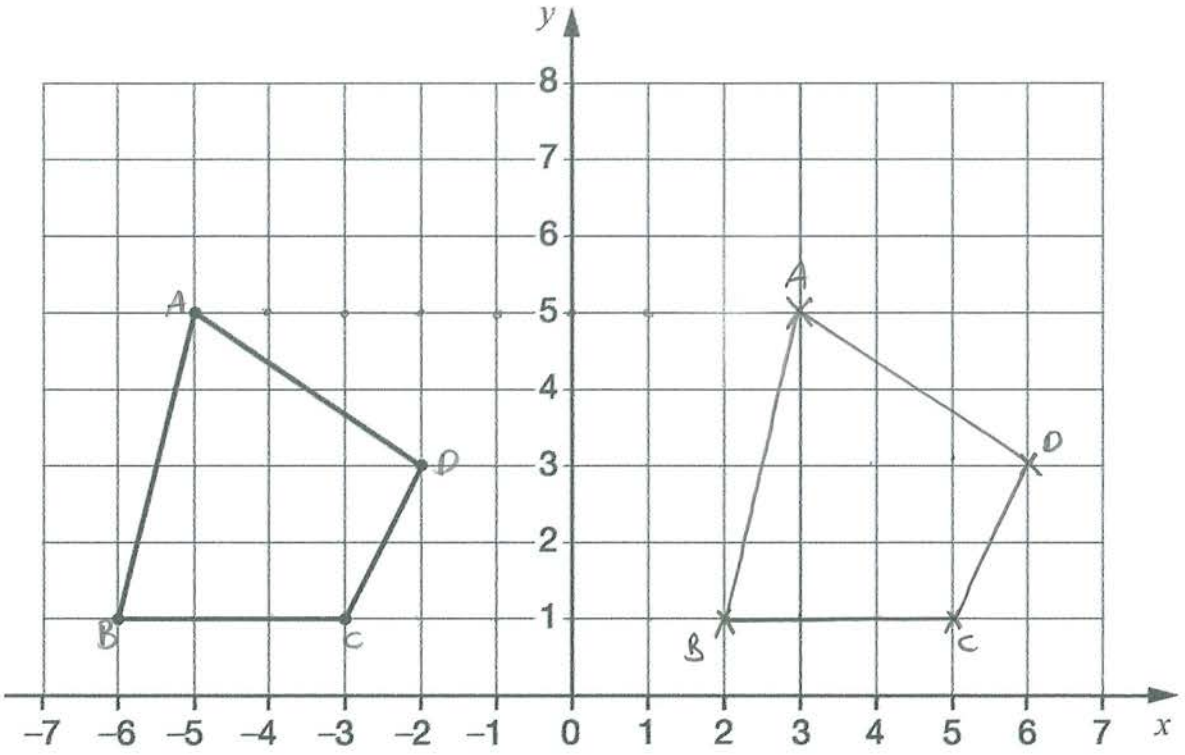
$9 \times 3 = 27$

$27 - 11 = 16$

$16 \div 2 = 8$

8 Here is a shape.

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



1 mark

Use a ruler.

Label each point and translate individually.

9 Write the missing numbers in the table.

Number of weeks	Number of days
1	7
2	14
4	28
6	42
10	70
15	105

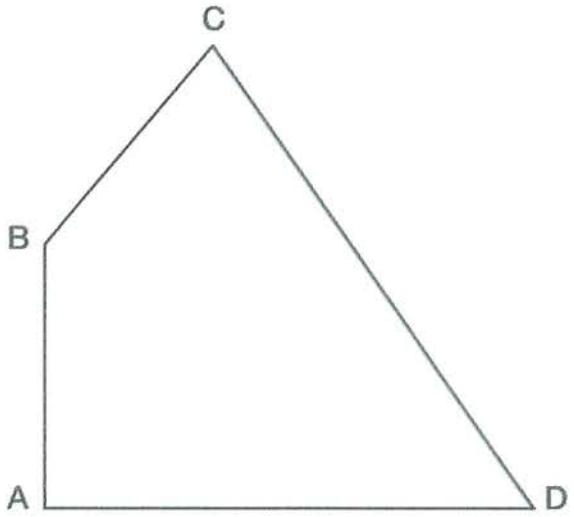
1 mark

$6 \times 7 = 42$

$10 \times 7 = 70$

$$7 \overline{)105} \quad 15$$

10

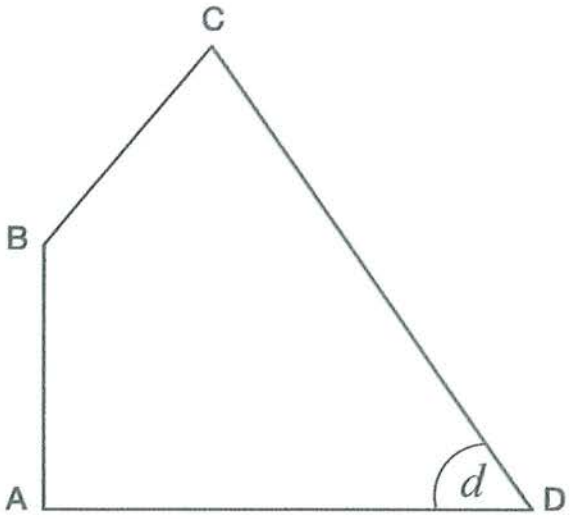


What is the perimeter of the shape, **in millimetres**?

Use a ruler.

210 mm

1 mark



Measure the size of angle d.

Use an angle measurer.

d is 55 °

1 mark

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

	5	7	3
−	3	0	5
	2	6	8

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.

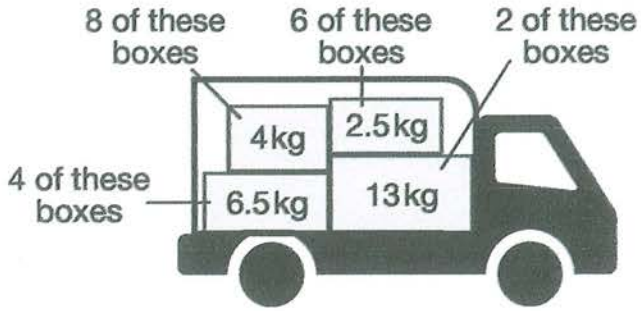
$\frac{1}{5}$ $\frac{3}{4}$ $\frac{8}{10}$ $\frac{7}{8}$

least

1 mark

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

$8 \times 4 = 32$
$13 \times 2 = 26$
$6 \times 2.5 = 15$
$4 \times 6.5 = 26$

$32 + 26 + 26 + 15 = 99$

99 kg

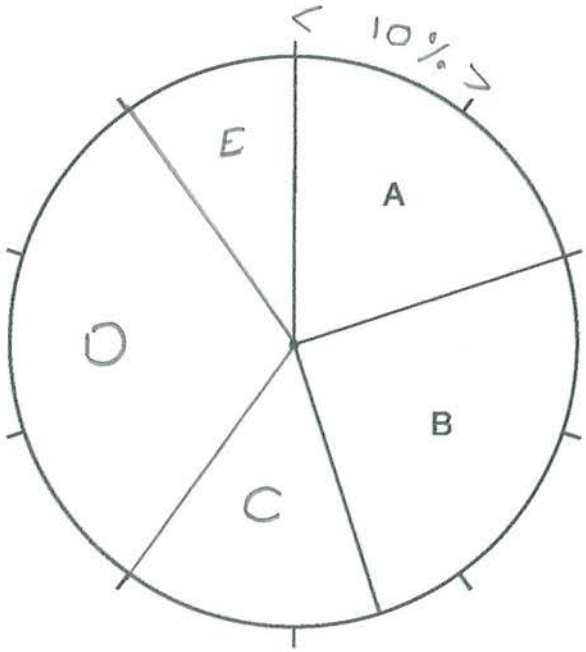
2 marks

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

10% of 680 = 68

5% of 680 = 34

68 × 3 = 204

204 + 34 = 238

2

1 12

2 3 8

− 1 5 9

7 9

79

2 marks

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

$$\frac{3}{5} < \frac{\boxed{65}}{100} < 0.7$$

1 mark

$\frac{60}{100}$ $\frac{70}{100}$

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

2 ☑ (54) 1×54 2×27 3×18 9×6

3 ☑ (72) 2×36 3×24 4×18 8×9

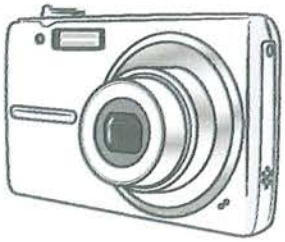
4 ☐

8 ☐

9 ☑

1 mark

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

w10 x 2 = £20

65 - 20 = £45

45 ÷ 3 = 15w

10 + 15 = 25

25 weeks

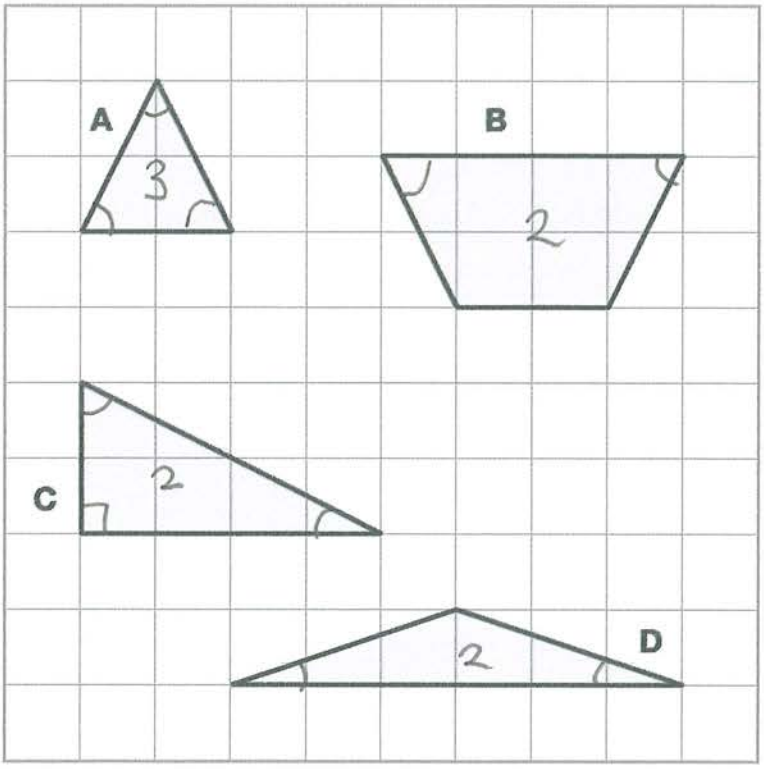
2 marks

19 Complete this division.

$$\begin{array}{r} 364\ r1 \\ 12\overline{)4376} \\ -3600 \\ \hline 776 \\ -720 \\ \hline 56 \\ -48 \\ \hline 8 \end{array}$$

2 marks

20 Here are four shapes on a grid.



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

B C & D

1 mark

21 A band holds a concert for charity.

The tickets cost £27 each.

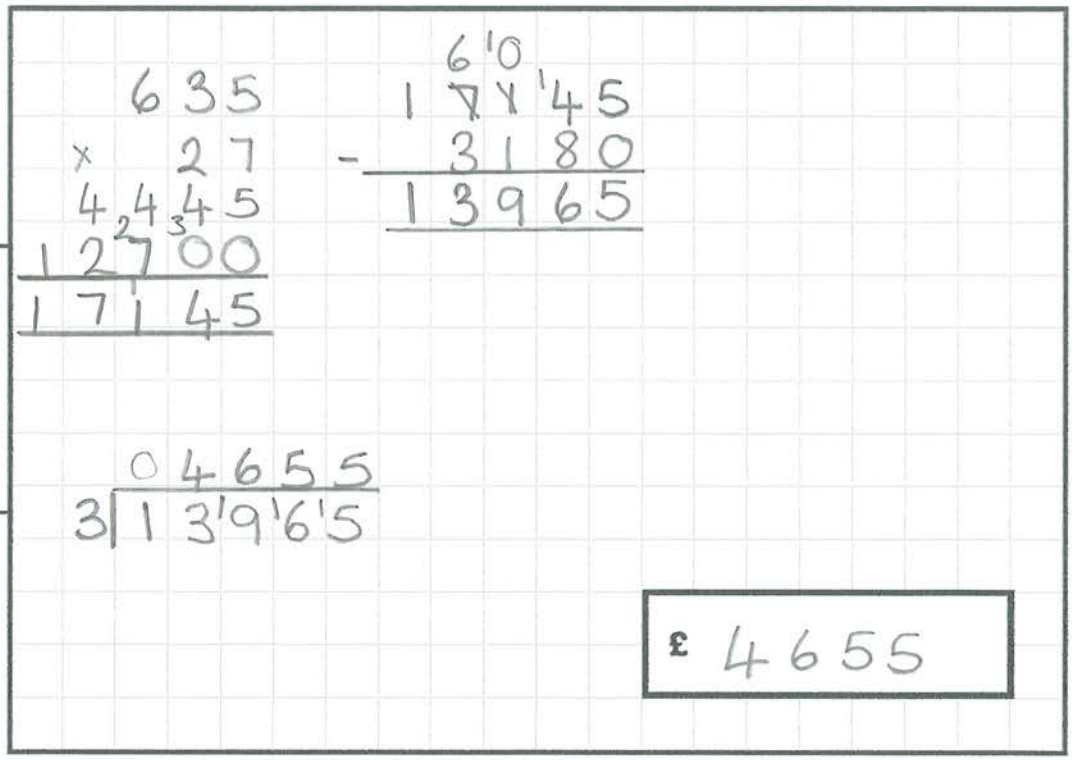
They sell 635 tickets.

They pay £3,180 to use the hall.

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

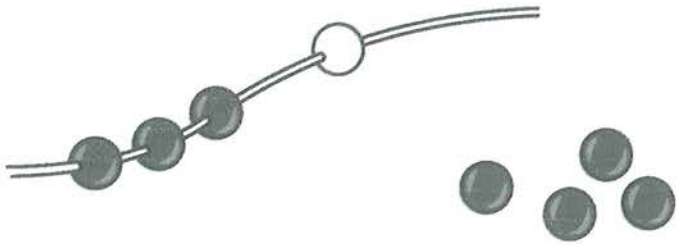
How much money does the band give to charity?

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.

black = (white × 3) + 4

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

How many black beads does she use?

$B = (12 \times 3) + 4$

$B = 36 + 4$

$B = 40$

40

1 mark

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

How many white beads does she use?

$25 = (W \times 3) + 4$

$25 - 4 = 21$

$21 = (W \times 3)$

$21 = (7 \times 3)$

7

1 mark

23 Complete the table.

Name of 3-D shape	Number of faces
cube	6
pentagonal prism	7
triangular-based pyramid	4

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.

$\frac{1}{2} \times \frac{5}{6} = \frac{5}{12}$ $\quad \frac{1}{3} \times \frac{7}{8} = \frac{7}{24}$

$\frac{5}{12} = \frac{10}{24}$ $\quad \frac{10}{24} > \frac{7}{24}$

1 mark

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Standards & Testing Agency

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Paper 3: reasoning
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