Rewarding Learning

Centre Number

Candidate Number

General Certificate of Secondary Education
November 2021

Mathematics

StemUp Model Solution

Unit M5 Paper 1
(Non-Calculator)
Foundation Tier



[GMC51]

GMC51

THURSDAY 2 DECEMBER, 9.15am–10.15am

TIME

1 hour.

INSTRUCTIONS TO CANDIDATES

Write your Centre Number and Candidate Number in the spaces provided at the top of this page. **You are provided with Foundation Tier Additional Support Materials for use with this paper.**
You must answer the questions in the spaces provided.
Do not write outside the boxed area on each page, on blank pages or tracing paper.
Complete in black ink only. **Do not write with a gel pen.**
Answer **all sixteen** questions.
All working should be clearly shown in the spaces provided. Marks may be awarded for partially correct solutions.
You **must not** use a calculator for this paper.

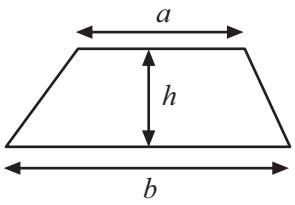
INFORMATION FOR CANDIDATES

The total mark for this paper is 50.
Figures in brackets printed down the right-hand side of pages indicate the marks awarded to each question or part question.
You should have a ruler, compasses and a protractor.
The Formula Sheet is on page 2.

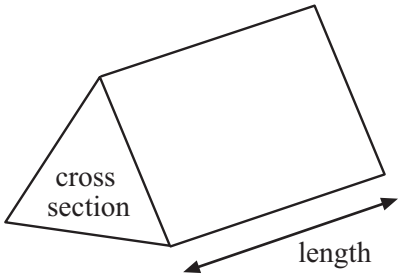
12921

Formula Sheet

Area of trapezium $= \frac{1}{2}(a + b)h$



Volume of prism = area of cross section × length



12921

1 **(a)** Which digit **in the answer** is incorrect in this subtraction?

Circle your answer.

$$\begin{array}{rccc} & 8 & 0 & 3 \\ - & 1 & 7 & 5 \\ \hline & 6 & (3) & 8 \end{array}$$

[1]

(b) **(i)** Which **digit in the answer to** this division is wrong?

Circle your answer.

$$\begin{array}{r|cccc} & & 1 & 3 & (8) \\ \hline 7 & 9 & {}^{2}7 & {}^{6}3 \end{array}$$

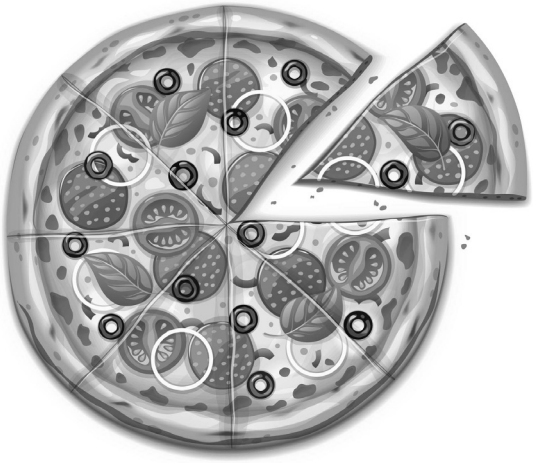
[1]

9 ÷ 7 = 1 r 2, 27 ÷ 7 = 3 r 6, 63 ÷ 7 = 9

(ii) What should the correct digit be? Answer 9 [1]

[Turn over

2 **(a)** A pizza is cut into 8 pieces, each weighing 128 g.



Source: © Getty Images

What is the total weight of all the pieces?

128
× 8 8 × 128 = 1024
1024

Answer 1024 g [2]

(b) A petrol pump delivers 2.96 litres in 5 seconds.

Estimate how many litres it will deliver in one minute.

2.96 ≈ 3 litres in 5 seconds
1 minute = 60 s = 12 × 5 s
3 × 12 = 36

Answer 36 litres [2]

3 The number of pupils in each year group at Tower School for Boys and Girls is shown.

Year group	8	9	10	11	12
Number of pupils	48	42	61	52	47

A pupil is chosen at random.

(a) Which year group is the pupil chosen most likely to belong to?

Answer Year 10 [1]

(b) Which year group is the pupil chosen least likely to belong to?

Answer Year 9 [1]

A pupil is chosen at random from Year 12

Lara says:



(c) Explain why Lara is wrong.

Answer Year 12 has 47 pupils, an odd number, so there cannot be equal numbers of boys and girls. [1]

[Turn over

4 Pete puts a **2-digit number** into his calculator and multiplies it by 10

He looks at the new number.

(a) Fill in **one other** digit you know he must see on his calculator.

8		0

[1]

(b) Pete starts **with the same** 2-digit number.

This time he multiplies it by 1000

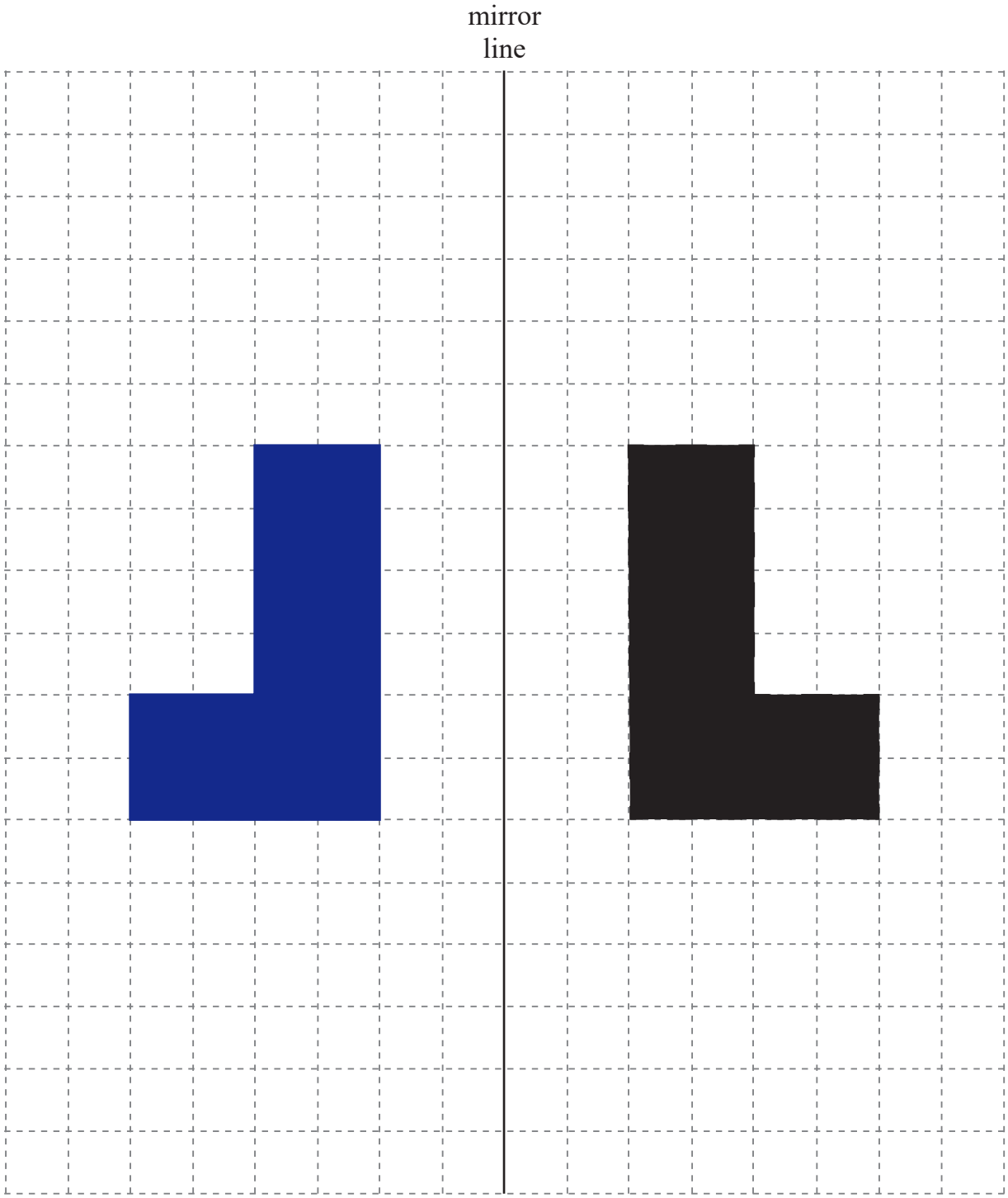
He looks at the new number.

Fill in **all** the missing digits that he sees on his calculator.

8	3	0	0	0

[1]

5 **(a)** Reflect the shape in the mirror line.



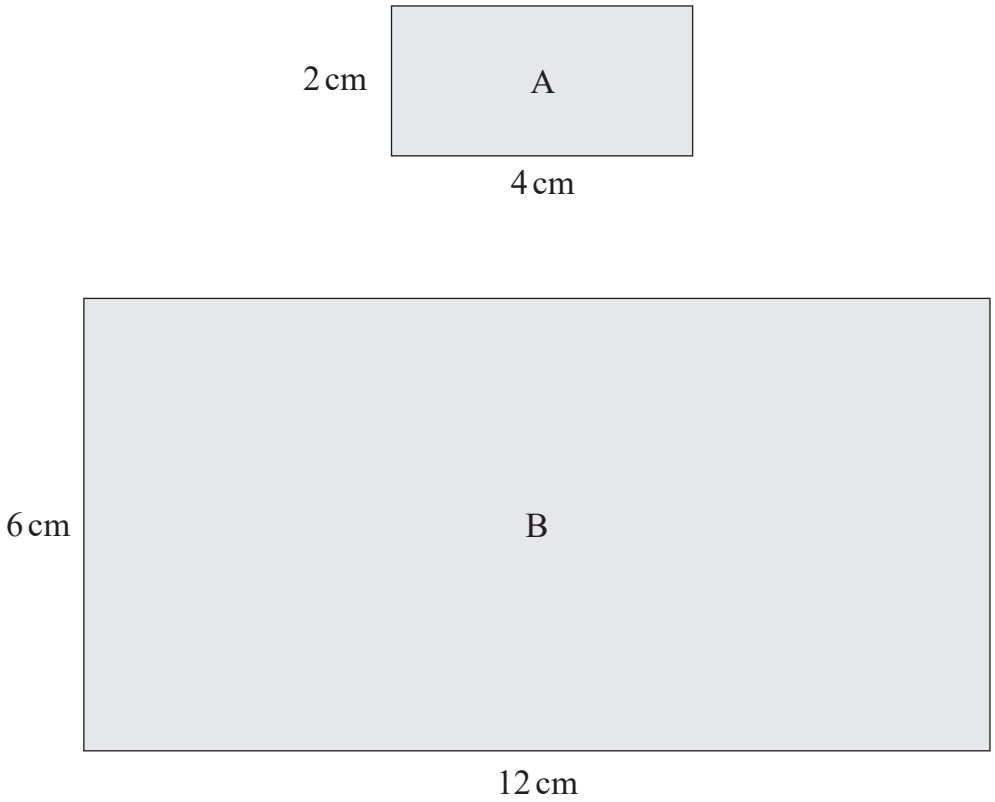
[1]

[Turn over

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(b) Rectangle B is an enlargement of Rectangle A.

What is the scale factor?



12 ÷ 4 = 3

Answer 3 [1]

6 **(a)** Work out the missing number.

$$54 \times 4 \times \boxed{25} = 5400$$

$4 \times 25 = 100, \quad 54 \times 100 = 5400$

Answer 25 [1]

(b) Work out the missing number.

$$68 \times 40 + 68 \times \boxed{60} = 6800$$

$68 \times (40 + 60) = 68 \times 100 = 6800$

Answer 60 [1]

[Turn over

7 There are 45 000 people in the town of Arrondale.

(a) $\frac{2}{9}$ of the people are children.

How many are children?

$\frac{45\,000}{9} = 5000$

$5000 \times 2 = 10\,000$

Answer 10 000 [2]

(b) 30% of the people in Arrondale are over 65

How many are over 65?

10% of 45 000 = 4500

30% = 3 × 4500 = 13 500

Answer 13 500 [2]

8 Grace cannot divide a number by 36

Her friend Chloe says,

"That's easy. Divide first by 4 and then divide by 9 as $4 \times 9 = 36$"

Use Chloe's method to divide 5238 by 54

Show your work.

54 = 9 × 6, so divide by 9 then divide by 6

```
   0  5  8  2
9 | 5 5 2 7 3 1 8
```

5238 ÷ 9 = 582

```
   0  9  7
6 | 5 5 8 4 2
```

582 ÷ 6 = 97

Answer 97 [2]

[Turn over

9 800 students attend Clarendon College.

15% of them are in Year 11

10% of Year 11 students are in the Spanish class.

Of **all** the students in Clarendon College, how many **are not** in the Year 11 Spanish class?

10% of 800 = 80, 5% of 800 = 40

15% of 800 = 80 + 40 = 120 in Year 11

10% of 120 = 12 in the Spanish class

800 − 12 = 788

Answer 788 [3]

10 Each new number in a sequence is found using the rule

multiply the previous number by 3 and then subtract 5

Find the next two numbers in this sequence.

2 , 1 , −2

$2 \times 3 - 5 = 6 - 5 = 1$

$1 \times 3 - 5 = 3 - 5 = -2$

[2]

[Turn over

11 A bag contains five counters, each one a different colour.

The colours are red (R), green (G), blue (B), white (W) and yellow (Y).

Daniel takes a counter at random from the bag.

Daniel now tosses a fair coin.

One possible outcome is (red, heads), which can be written as (R, H).

(a) List all the possible outcomes for this experiment in this way in the two-way table below.

One has already been done for you.

		Counter (colour)				
		R	**G**	**B**	**W**	**Y**
Coin	**H**	(R, H)	(G, H)	(B, H)	(W, H)	(Y, H)
	T	(R, T)	(G, T)	(B, T)	(W, T)	(Y, T)

[2]

(b) What is the probability that the outcome is (B, H)?

10 equally likely outcomes, 1 is (B, H)

Answer $\frac{1}{10}$ [1]

(c) What is the probability that the outcome of this experiment contains a green (G) or a tail (T) or both of these?

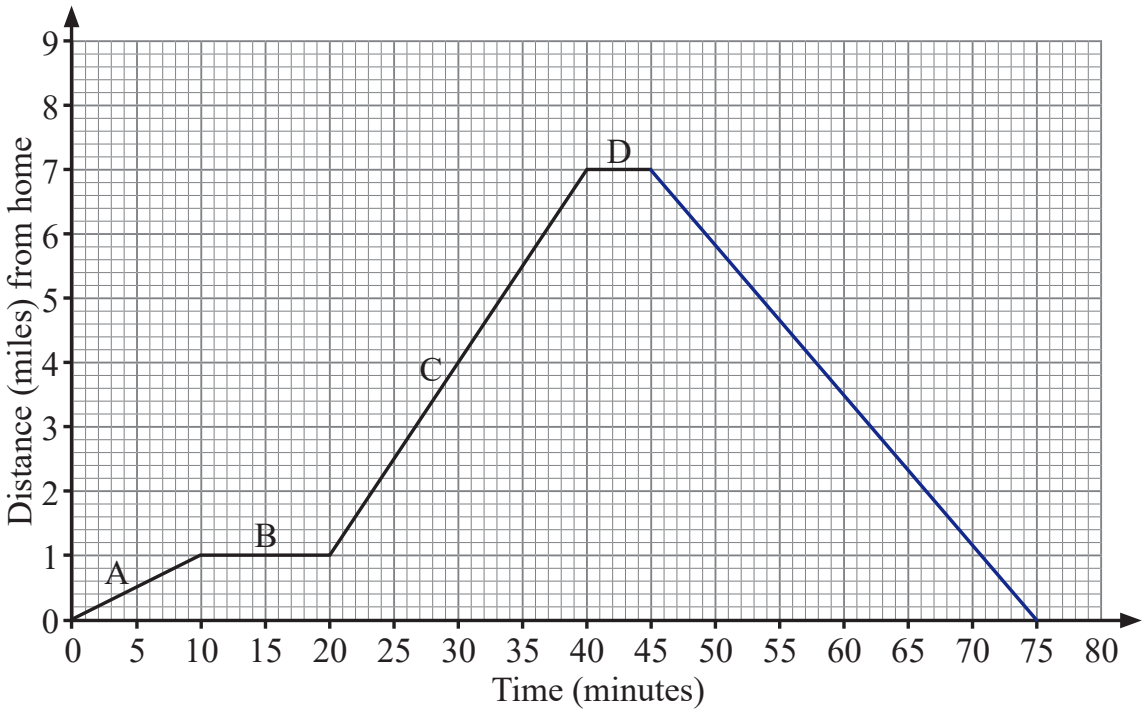
(G, H), (R, T), (G, T), (B, T), (W, T), (Y, T)
6 out of 10 outcomes

Answer $\frac{6}{10}$ [2]

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12 Mike is out for a bicycle ride. He starts from home.

The graph shows four stages of his ride labelled A, B, C and D.



(a) Which stage of the graph shows Mike repairing an **early** puncture?

Answer B [1]

(b) What is Mike's average speed during stage C?

6 miles in 20 minutes, 6 × 3 = 18

Answer 18 mph [1]

(c) Mike travels home at an average speed of 14 mph.

Complete the final stage of Mike's bicycle ride on the graph. [2]

7 miles at 14 mph: 7 ÷ 14 = ½ hour = 30 minutes

45 + 30 = 75 minutes

[Turn over

13

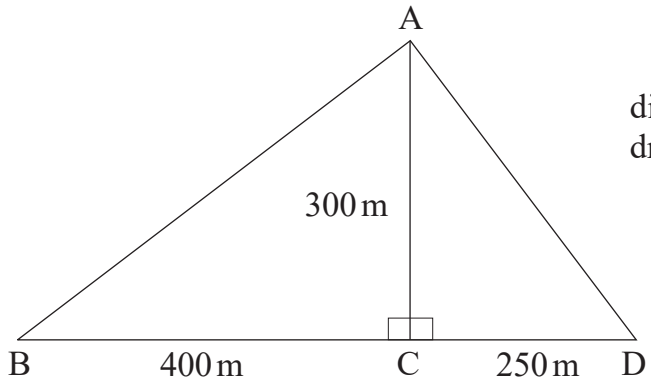
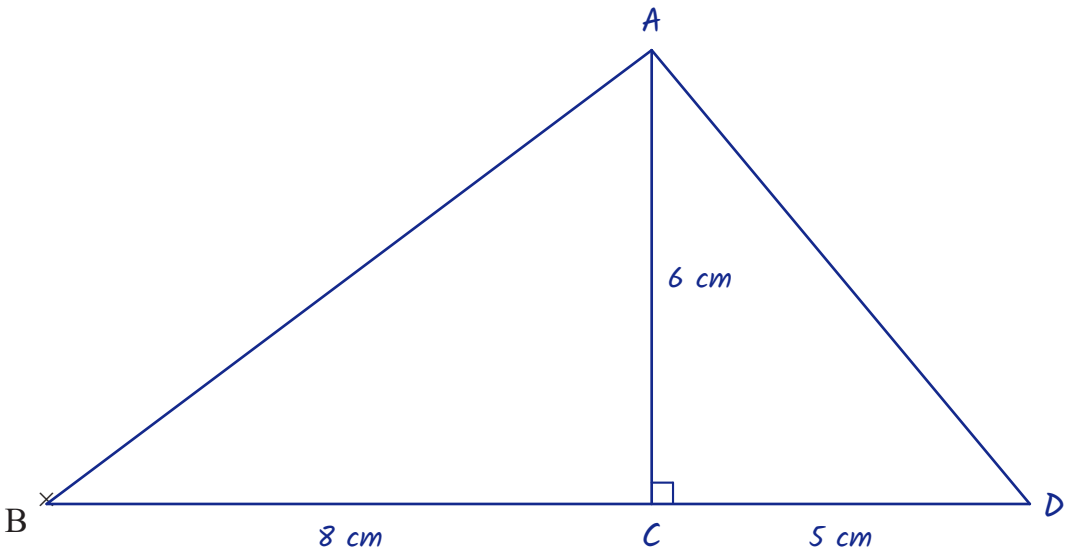


diagram not drawn accurately

(a) In the space below, make a scale drawing of the diagram ABCD shown above.

Use a scale of 1 cm to 50 m.

400 ÷ 50 = 8 cm, 250 ÷ 50 = 5 cm, 300 ÷ 50 = 6 cm



[3]

(b) Use your scale drawing to calculate the actual length of AB.

AB = 10 cm, 10 × 50 = 500

Answer AB = 500 m [1]

12921

14 This recipe makes 16 scones with the following ingredients.

Ingredients	
• 250 g flour • 1 tsp baking powder • 40 g butter • 25 g sugar • 1 large egg • about 100 ml milk	

Source: Getty Images 609903116

(a) Paul wants to make 20 scones.

How much butter will he need?

16 scones: 40 g, 4 scones: 40 ÷ 4 = 10 g
20 scones: 10 × 5 = 50 g

Answer 50 g [2]

(b) Paul has 300 g of flour.

Has he enough flour to make 20 scones?

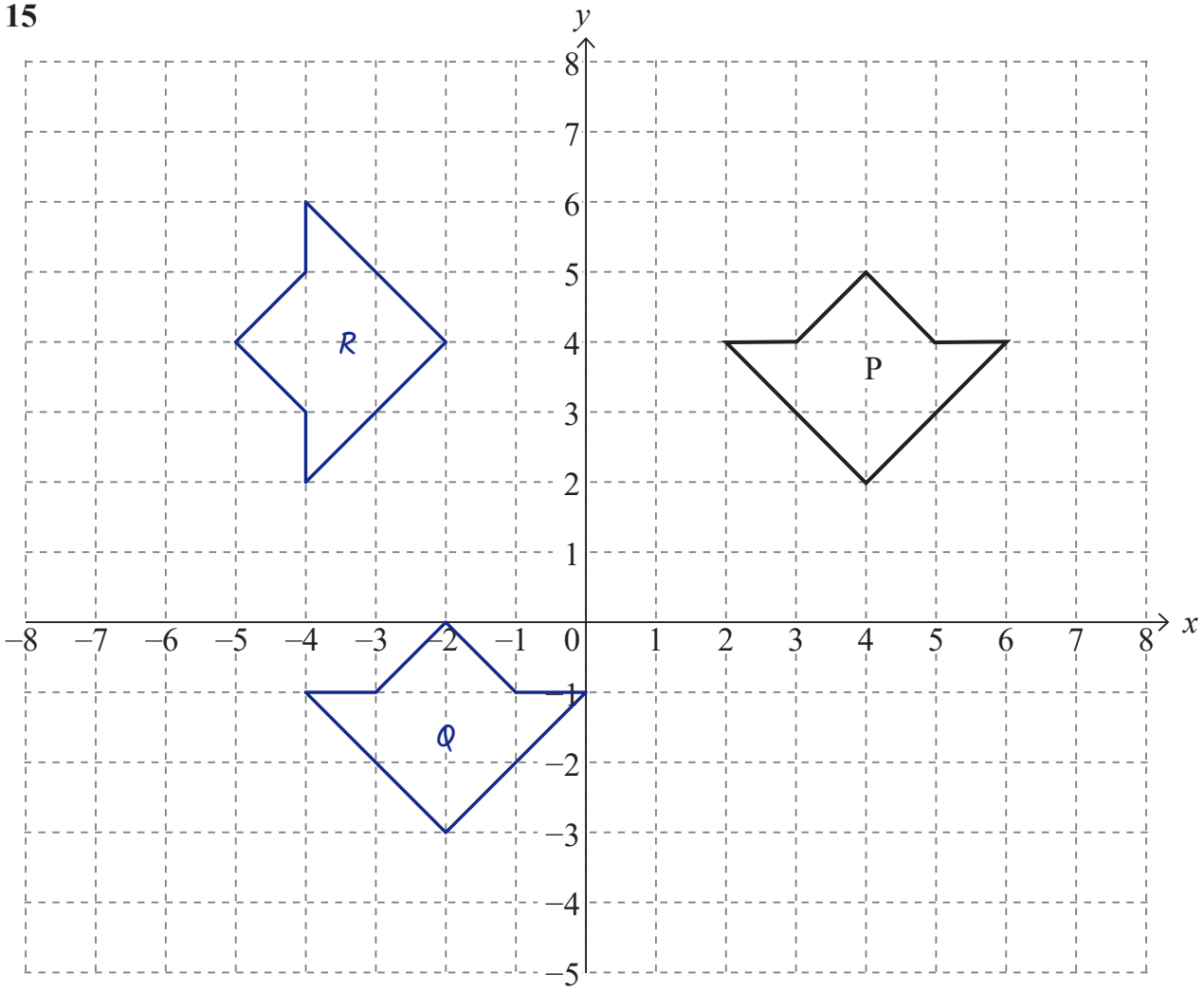
Show all your working.

4 scones: 250 ÷ 4 = 62.5 g
20 scones: 62.5 × 5 = 312.5 g flour
312.5 > 300

Answer No because he needs 312.5 g, which is 12.5 g more [2]

[Turn over

15



(a) On the grid above translate the shape P 6 units left and 5 units down.

Label the new shape Q. [1]

(b) On the same grid, rotate the shape P 90° anticlockwise about the origin.

Label the new shape R. [3]

16 A 6-sided dice is biased.

The table below gives the probabilities of getting a 1, 2, 3, 4 and 5 when this dice is rolled.

Outcome	1	2	3	4	5	6
Probability	0.13	0.17	0.2	0.11	0.14	0.25

Work out the probability of getting a 6 when this dice is rolled.

$0.13 + 0.17 + 0.2 + 0.11 + 0.14 = 0.75$

$1 - 0.75 = 0.25$

Answer 0.25 [2]

THIS IS THE END OF THE QUESTION PAPER

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For Examiner's use only	
Question Number	**Marks**
1	
2	
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Total Marks	

Examiner Number

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