Rewarding Learning

Centre Number

Candidate Number

General Certificate of Secondary Education
November 2024

Mathematics

StemUp Model Solution

Unit M5 Paper 1
(Non-Calculator)
Foundation Tier

[GMC51]



GMC51

THURSDAY 21 NOVEMBER, 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 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.**
Questions which require drawing or sketching should be completed using an HB pencil.
All working **must** be clearly shown in the spaces provided. Marks may be awarded for partially correct solutions.
You **must not** use a calculator for this paper.
Answer **all sixteen** questions.

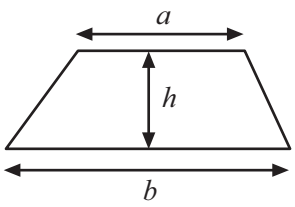
INFORMATION FOR CANDIDATES

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.

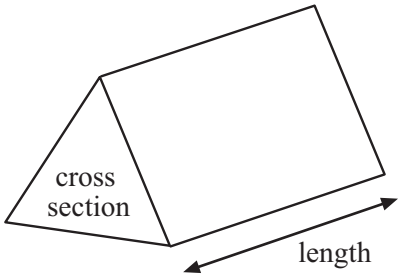
14865

Formula Sheet

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



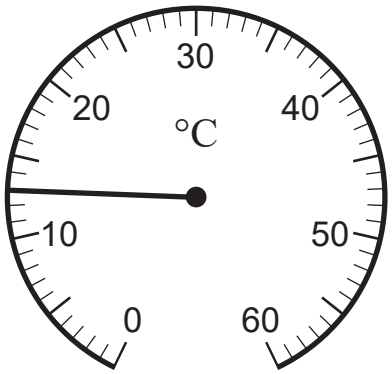
Volume of prism = area of cross section × length



14865

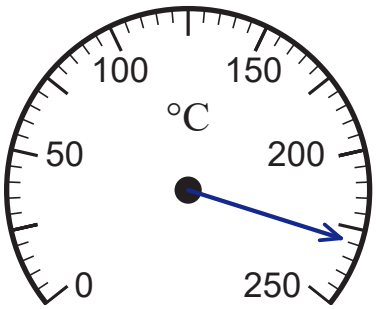
stemup.co.uk

1 **(a)** What temperature is shown on the gauge?



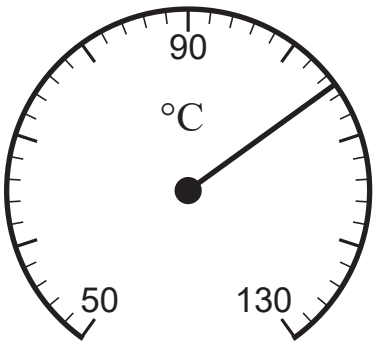
Answer 13 °C [1]

(b) Mark a temperature of 230 °C on the gauge.



[1]

(c) What temperature is shown on the gauge?



Answer 105 °C [1]

[Turn over

2 The **cash** price for a games console is £480

The **credit** price is £180 deposit and then 12 monthly payments of £30

How much **cheaper** is it to pay by cash than by credit?

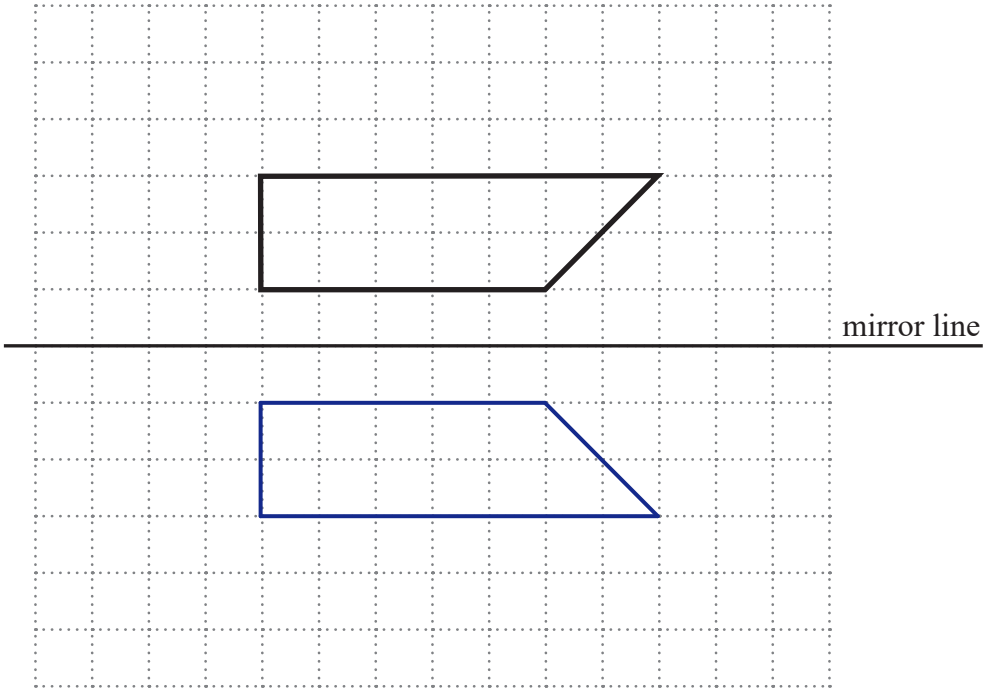
Credit: 12 × 30 = 360

180 + 360 = £540

Difference: 540 − 480 = 60

Answer £ 60 [3]

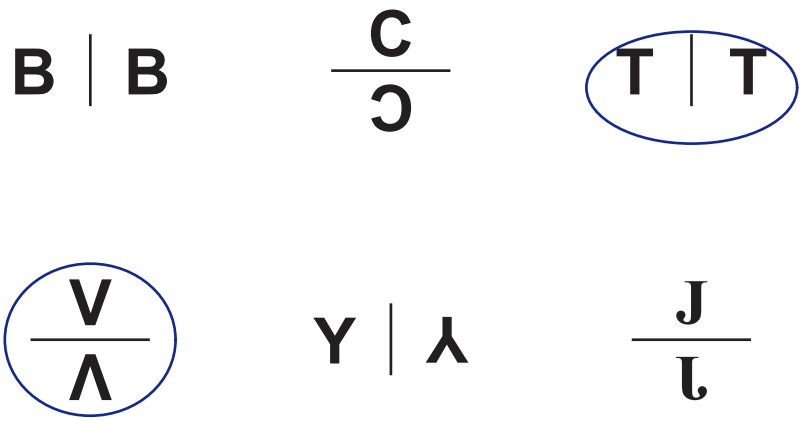
3 **(a)** Reflect the shape in the mirror line.



[2]

(b) Which **two** of these reflections are correct?

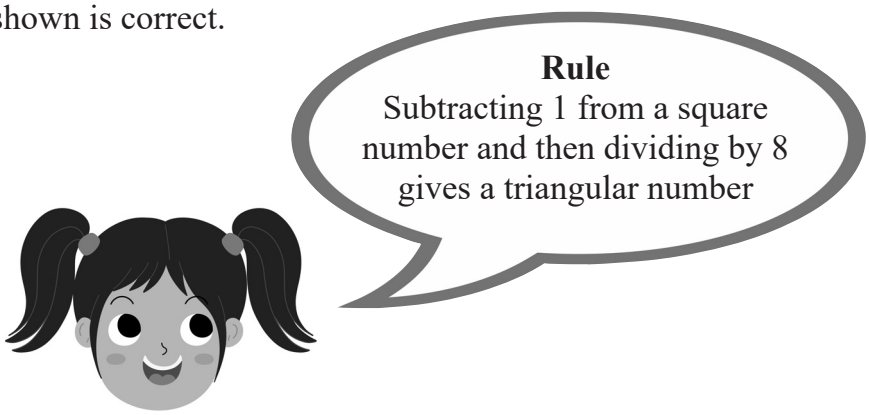
Circle your answers.



[1]

[Turn over

4 Clare says that the rule shown is correct.



(a) Show that the rule is correct for the square number 169

169 − 1 = 168

168 ÷ 8 = 21

Triangular numbers: 1, 3, 6, 10, 15, 21

21 is a triangular number, so the rule works for 169

[2]

Clare's dad doesn't agree with her.

He says that this rule only works some of the time.

(b) Who is right?

Explain your answer clearly.

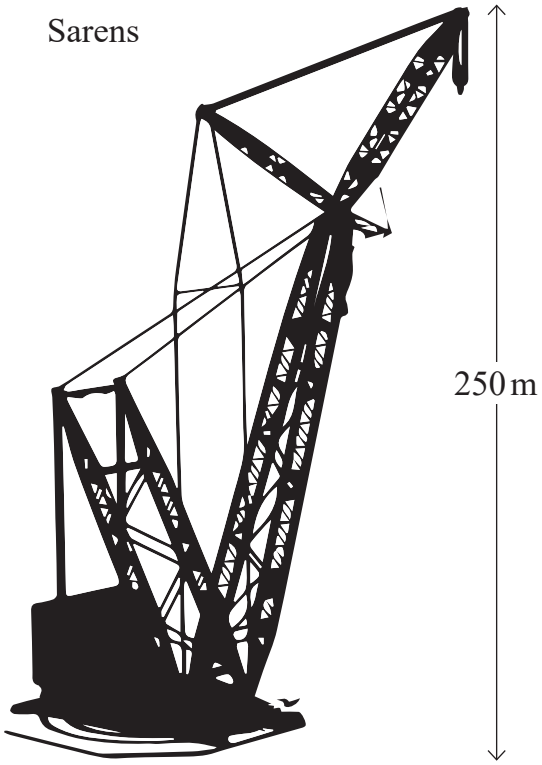
Try 100: 100 − 1 = 99, 99 ÷ 8 = 12.375 (not a whole number)

Try 49: 49 − 1 = 48, 48 ÷ 8 = 6 (triangular)

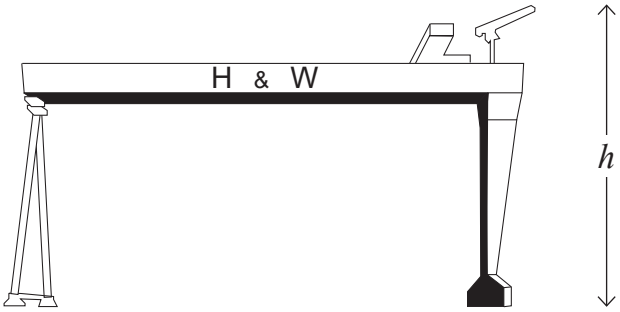
Answer *Clare's dad* because *100 − 1 = 99 and 99 is not divisible by 8, so the rule does not always work* [2]

5

Sarens



Samson



Two cranes, **drawn to scale**, are shown.

Sarens is 250 m tall.

What height, *h*, is Samson?

Show your working out clearly.

Sarens measures 10 cm, Samson measures 4 cm

250 ÷ 10 = 25, so 1 cm represents 25 m

h = 25 × 4 = 100

Answer *100* m [4]

[Turn over

6 **(a)** A fair six-sided dice is rolled.

Write down the probability that it lands on a number **greater than 5**

Give your answer as a **fraction**.

Answer $\frac{1}{6}$ [1]

(b) An event is **certain** to happen.

Mark this probability on the probability scale below with an ×.



[1]

(c) An event is **unlikely** to happen.

Mark this probability on the probability scale below with an ×.



[1]

(d) Clay has a drawer of T-shirts.

He has 5 red T-shirts.

The probability that he picks a red T-shirt at random is $\frac{1}{4}$

How many T-shirts has Clay altogether?

$5 \times 4 = 20$

Answer 20 T-shirts [1]

7



Source: © Getty Images

14 out of 20 people who had dinner in a restaurant ordered dessert.

(a) What is the **ratio** of the number of people who ordered dessert to the number of people who didn't order dessert?

Give your answer in its simplest form.

Did not order dessert: 20 − 14 = 6

14 : 6 = 7 : 3 (÷ 2)

Answer 7 : 3 [2]

3 of these 20 people in the restaurant changed their mind and ordered dessert.

(b) Write down the new ratio for the number of people who ordered dessert to the number of people who didn't order dessert.

Ordered: 14 + 3 = 17, did not: 20 − 17 = 3

Answer 17 : 3 [2]

[Turn over

8 Luke is going to choose two different pizza toppings.

He can choose from

Ham (H) Chilli (C) Mushrooms (M) Olives (O)

Write down all the topping combinations Luke can choose.

HC HM HO

CM CO

MO

[2]

9 Max is playing a game with cards.

There are four blue cards numbered 1, 2, 3 and 4

There are three yellow cards numbered 2, 3 and 4

The cards are placed with the numbers facing downwards.

He takes one blue card at random and one yellow card at random.

He **multiplies** the two numbers together to get his score.

(a) Complete the table to show the possible scores.

		Blue			
	×	**1**	**2**	**3**	**4**
Yellow	**2**	2	4	6	8
	3	3	6	9	12
	4	4	8	12	16

[2]

(b) What is the probability that he gets a score which is

(i) an even number, Answer $\frac{10}{12}$ [1]

even: 2, 4, 6, 8, 6, 12, 4, 8, 12, 16 = 10 out of 12

(ii) a number greater than 4, Answer $\frac{8}{12}$ [1]

greater than 4: 6, 8, 6, 9, 12, 8, 12, 16 = 8

(iii) a prime number? Answer $\frac{2}{12}$ [1]

prime: 2 and 3 = 2 out of 12

[Turn over

10 Write down the next two terms in the sequence below

39 37 33 27 19 _____9_____ _____−3_____ [2]

differences: −2, −4, −6, −8, so next −10, −12

19 − 10 = 9, 9 − 12 = −3

11 Laura deposits £7 200 in a bank for one year.

The interest rate is 2% per year.

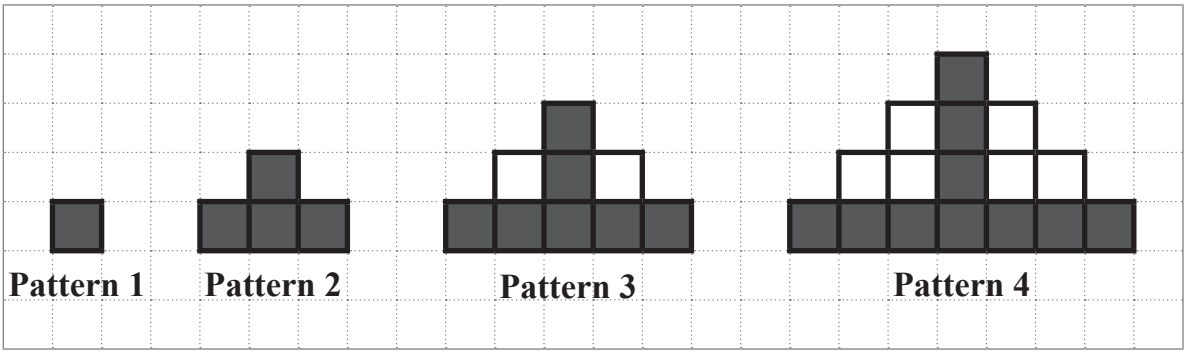
How much **interest** does Laura receive at the end of the year?

1% = 7200 ÷ 100 = 72

2% = 72 × 2 = 144

Answer £ _____144_____ [2]

12 The first four patterns in a sequence are shown below.



(a) Write down the **total** number of squares for each of the patterns shown.

Pattern 1 = 1 Pattern 2 = 4 Pattern 3 = 9 Pattern 4 = 16

[1]

(b) Use your answer in part **(a)** to help calculate the **total** number of squares in Pattern 7

square numbers: $7^2 = 7 \times 7 = 49$

Answer 49 squares [1]

The number of **black** squares also follows a sequence.

(c) Use this sequence to help calculate the number of **white** squares in Pattern 7

Black: 1, 4, 7, 10, ... (add 3 each time)

Pattern 7: 10 + 3 + 3 + 3 = 19 black

White = 49 − 19 = 30

Answer 30 white squares [3]

[Turn over

13 A school canteen supervisor asked a sample of students what drink they bought in the canteen.

The table shows the results.

Drink	Frequency
Tea	6
Coffee	10
Orange juice	4
Hot chocolate	3
Water	7

On a later day, 300 students buy a drink in the canteen.

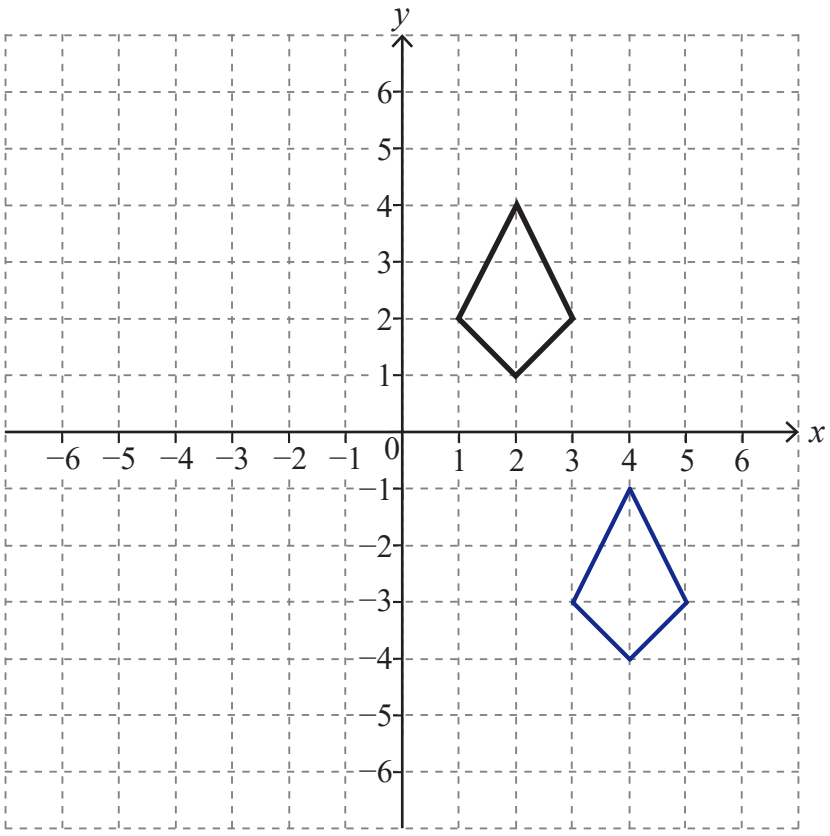
How many students do you expect to buy tea?

Total = 6 + 10 + 4 + 3 + 7 = 30

$\frac{6}{30} \times 300 = \frac{1}{5} \times 300 = 60$

Answer 60 students [2]

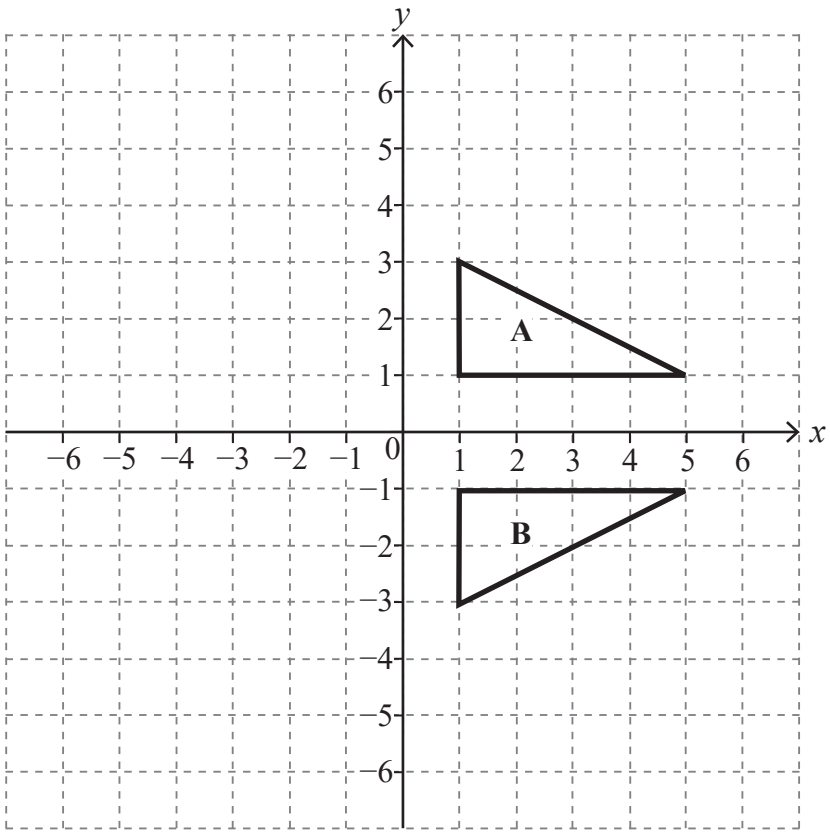
14 Translate the shape 2 to the right and 5 down.



[2]

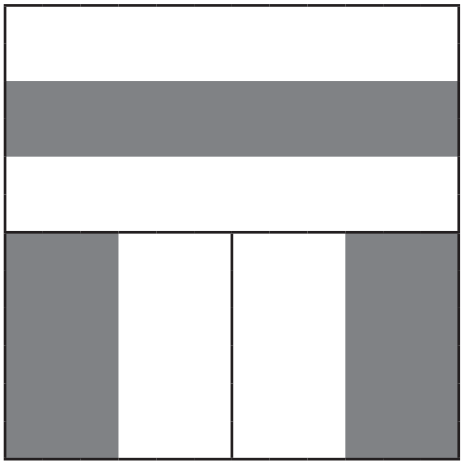
[Turn over

15 Describe fully the single transformation that maps **A** to **B**.



Answer Reflection in the x axis [2]

16



A square is divided into two halves.

The top half is divided into 3 equal parts.

The bottom half is divided into 4 equal parts.

What fraction of the whole square is shaded?

$\frac{1}{3} \times \frac{1}{2} = \frac{1}{6}$ (top shaded part)

$\frac{1}{4} \times \frac{1}{2} = \frac{1}{8}$ (each bottom shaded part)

$\frac{1}{6} + 2 \times \frac{1}{8} = \frac{1}{6} + \frac{1}{4} = \frac{2}{12} + \frac{3}{12} = \frac{5}{12}$

Answer $\frac{5}{12}$ [3]

THIS IS THE END OF THE QUESTION PAPER

BLANK PAGE

DO NOT WRITE ON THIS PAGE

stemup.co.uk

BLANK PAGE

DO NOT WRITE ON THIS PAGE

Sources: All images © CCEA unless stated

DO NOT WRITE ON THIS PAGE

For Examiner's use only	
Question Number	**Marks**
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	
16	
Total Marks	

Examiner Number

Permission to reproduce all copyright material has been applied for.
In some cases, efforts to contact copyright holders may have been unsuccessful and CCEA will be happy to rectify any omissions of acknowledgement in future if notified.

stemup.co.uk