Rewarding Learning

Centre Number

Candidate Number

General Certificate of Secondary Education
November 2025

Mathematics

StemUp Model Solution

Unit M6 Paper 1
(Non-Calculator)
Foundation Tier

[GMC61]

GMC61

THURSDAY 20 NOVEMBER, 9.15am–10.15am

TIME

1 hour.

INSTRUCTIONS TO CANDIDATES

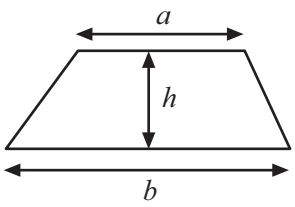
Write your Centre Number and Candidate Number in the spaces provided at the top of this page.
You must answer the questions in the spaces provided.
Do not write outside the boxed area on each page, on blank pages or tracing paper.
Complete in black ink only. **Do not write with a gel pen.**
Questions 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 nineteen** questions.

INFORMATION FOR CANDIDATES

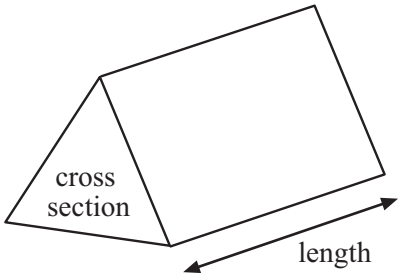
The total mark for this paper is 50.
Figures in brackets printed down the right-hand side of pages indicate the marks awarded to each question or part question.
You should have a ruler, compasses and a protractor.
The Formula Sheet is on page 2.

Formula Sheet

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



Volume of prism = area of cross section × length



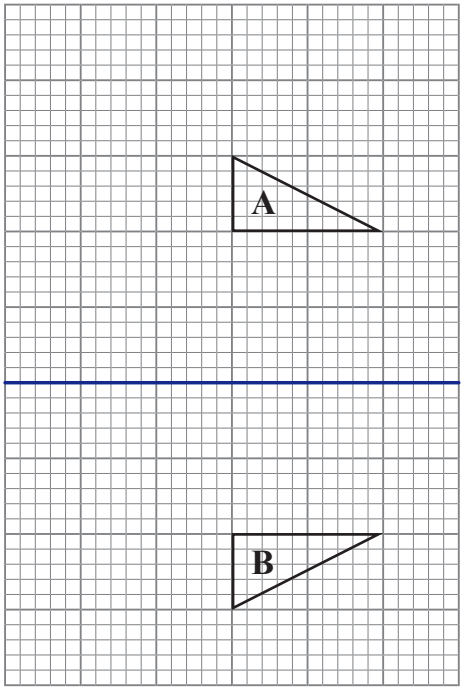
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(Questions begin overleaf)

1 **(a)** Triangle **A** is reflected and its image labelled **B**.

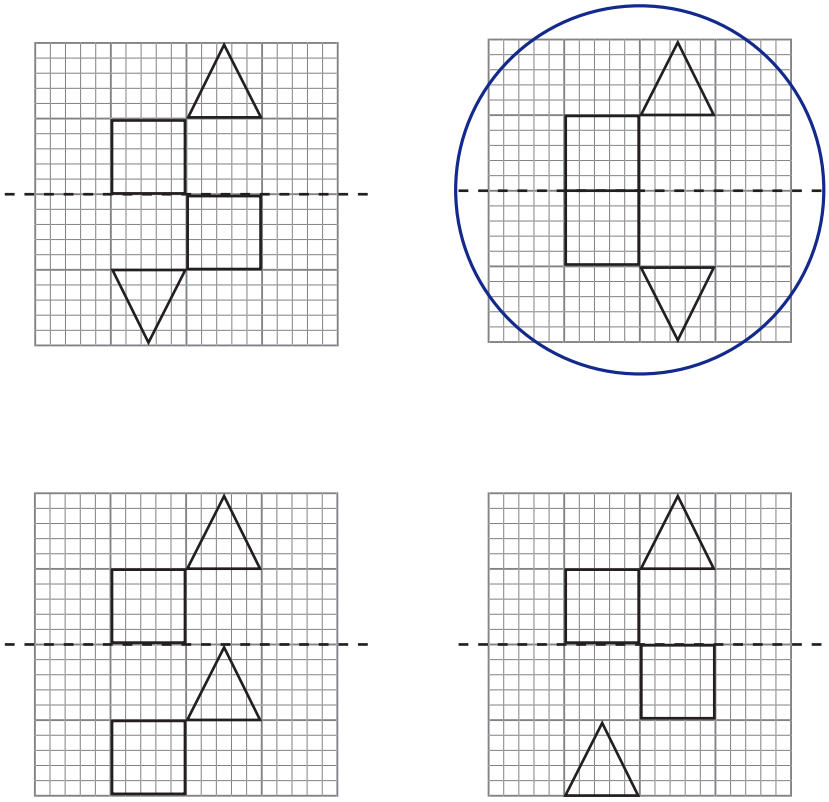
Draw the mirror line on the grid.



[1]

(b) Which one of the reflections is correct?

Circle your answer.



[1]

[Turn over

2 There are 11 boys and 14 girls in a class.

(a) One student is chosen at random from the class.

What is the probability that a girl is chosen?

Give your answer as a fraction.

11 + 14 = 25 students, 14 are girls

Answer $\frac{14}{25}$ [1]

(b) The probability that a student in the class has a mobile phone is $\frac{4}{5}$

How many students in the class have a mobile phone?

$\frac{4}{5}$ × 25 = 100 ÷ 5 = 20

Answer 20 [1]

3 Jonah's dad is 40 years old.

Jonah is a fifth of his dad's age.

What will be the difference in their ages in 6 years' time?

Jonah = 40 ÷ 5 = 8 years old

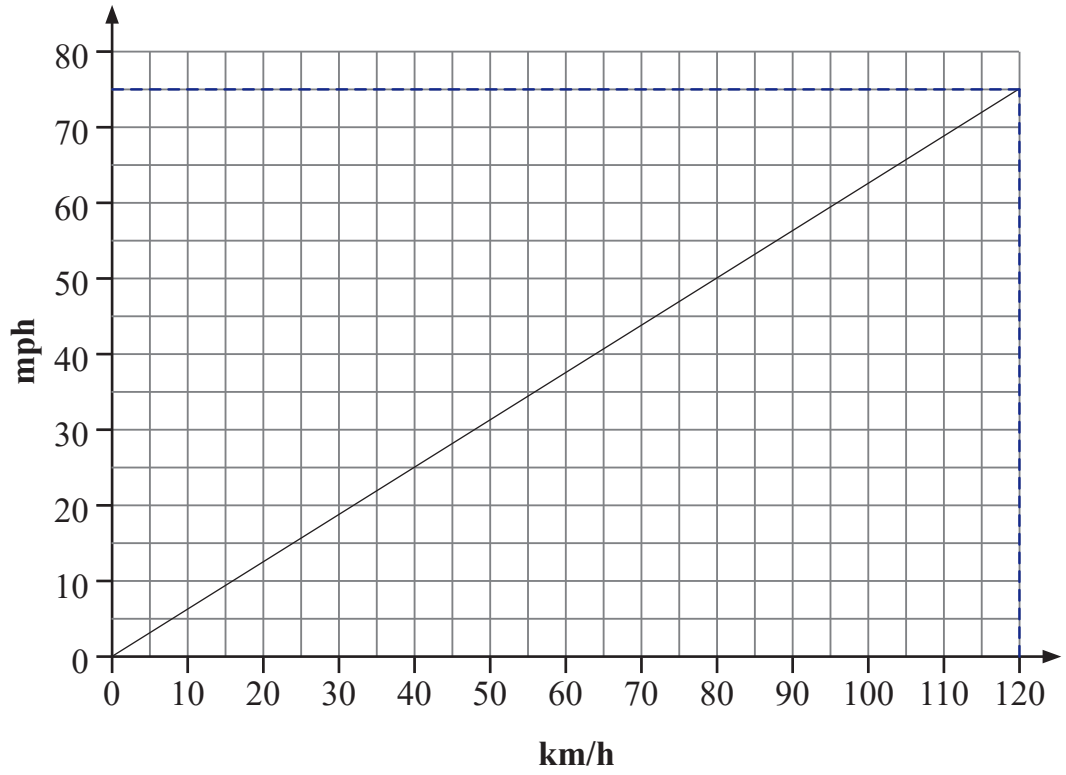
In 6 years: dad = 40 + 6 = 46, Jonah = 8 + 6 = 14

Difference = 46 − 14 = 32

Answer 32 years [3]

[Turn over

4



The take-off speed of a jet is 240 kilometres per hour (km/h).

Use the graph to find the take-off speed of this jet in miles per hour (mph).

From the graph: 120 km/h = 75 mph

240 km/h = 2 × 120 km/h

so take-off speed = 2 × 75 = 150 mph

Answer *150* mph [2]

5 **Estimate** the value of

(a) $(20.3)^2$

$20.3 \approx 20$

$20^2 = 20 \times 20 = 400$

Answer 400 [1]

(b) $\sqrt{103}$

$\sqrt{100} = 10$ and 103 is close to 100

so $\sqrt{103} \approx 10$

Answer 10 [1]

[Turn over

6 Pat's car journey took 7 hours.

She spent 15% of the journey stopped at service stations.

How many **minutes** of the journey were spent driving?

Show your working out clearly.

7 hours = 7 × 60 = 420 minutes

10% of 420 = 42

5% of 420 = 42 ÷ 2 = 21

15% = 42 + 21 = 63 minutes stopped

Driving = 420 − 63 = 357 minutes

Answer 357 minutes [4]

7 **(a)** Fill in the two missing numbers in this sequence.

−2 , 1, 6, 13, 22, 33, 46 [2]

+3 +5 +7 +9 +11 +13

(b) Each new number in a different sequence is found by using the rule

"Square the previous term and add 7"

The first term is 3

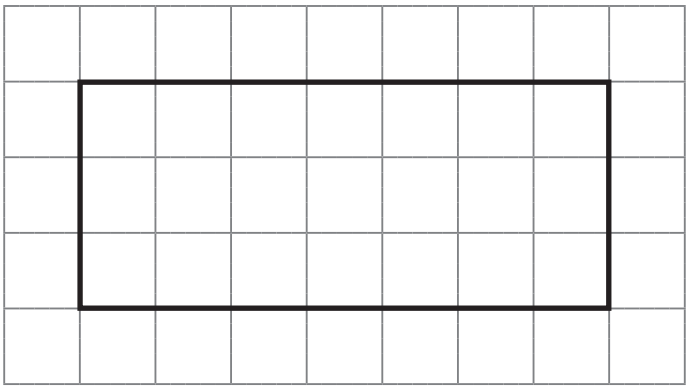
Find the second term.

$3^2 + 7 = 9 + 7 = 16$

Answer 16 [1]

[Turn over

8 This is a scale drawing of the floor of Jacob's warehouse.



The scale is 1 cm = 5 m

Work out the actual perimeter of the floor of the warehouse.

Drawing: length = 7 cm, width = 3 cm

Perimeter = 7 + 3 + 7 + 3 = 20 cm

Actual perimeter = 20 × 5 = 100 m

Answer *100* m [3]

9 Jenny has some tins of soup.

4 are lentil

6 are lentil and bacon

3 are chicken

Total tins
= 4 + 6 + 3 = 13

One tin is taken at random.

What is the probability of taking a tin which

(a) is chicken, $\frac{3}{13}$ [1]

(b) is mushroom, $\frac{0}{13} = 0$ [1]

4 + 6 = 10

(c) contains lentils? $\frac{10}{13}$ [1]

10 The ratio of flour to sugar is 7 : 6 in a recipe.

There are 180 grams of sugar.

How many grams of flour are there?

180 ÷ 6 = 30 grams for each part

Flour = 7 × 30 = 210 grams

Answer 210 grams [2]

[Turn over

11 Chloe goes on holiday.

She spends $\frac{3}{7}$ of her time at the beach.

She spends 25% of her time sightseeing.

The rest of her time is spent at the hotel.

What **fraction** of Chloe's time is spent at the hotel?

Show your working out clearly.

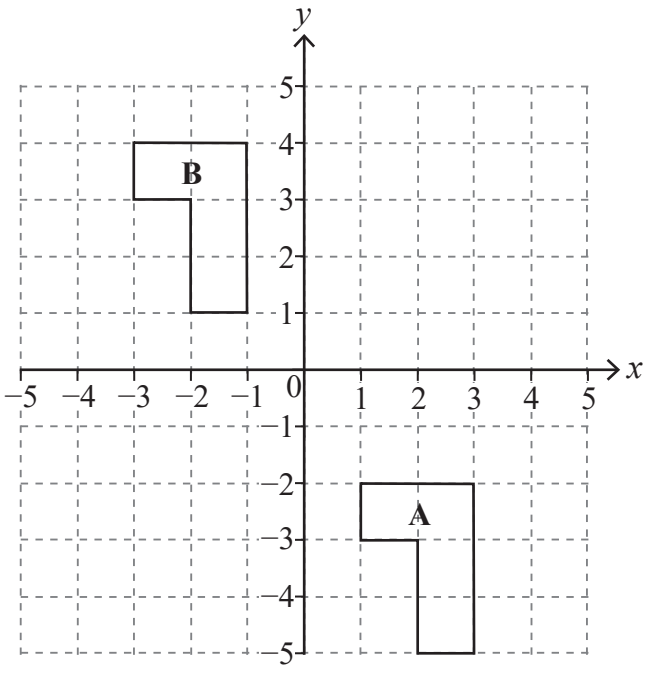
$25\% = \frac{1}{4}$

$\text{Beach + sightseeing} = \frac{3}{7} + \frac{1}{4} = \frac{12}{28} + \frac{7}{28} = \frac{19}{28}$

$\text{Hotel} = 1 - \frac{19}{28} = \frac{28}{28} - \frac{19}{28} = \frac{9}{28}$

Answer $\frac{9}{28}$ [3]

12 Describe fully the single transformation that maps B to A.



Answer Translation, 4 units right and 6 units down [2]

13 The length of a sports pitch is 92 m to the nearest metre.

Write down the shortest possible length of the sports pitch.

Answer 91.5 m [1]

[Turn over

14 Find the sum of the angles in the polygon ABCDEFGH.

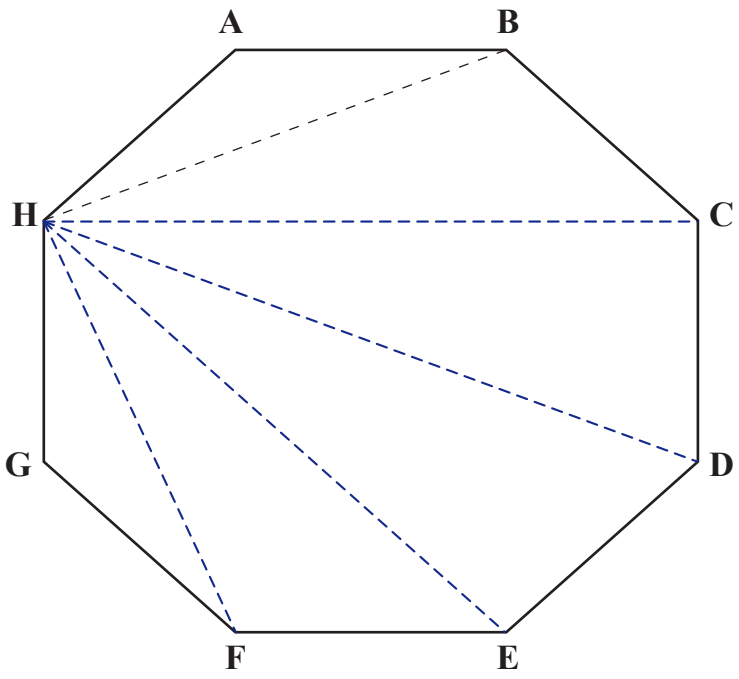


diagram not drawn accurately

8 sides, so the octagon splits into 6 triangles from H

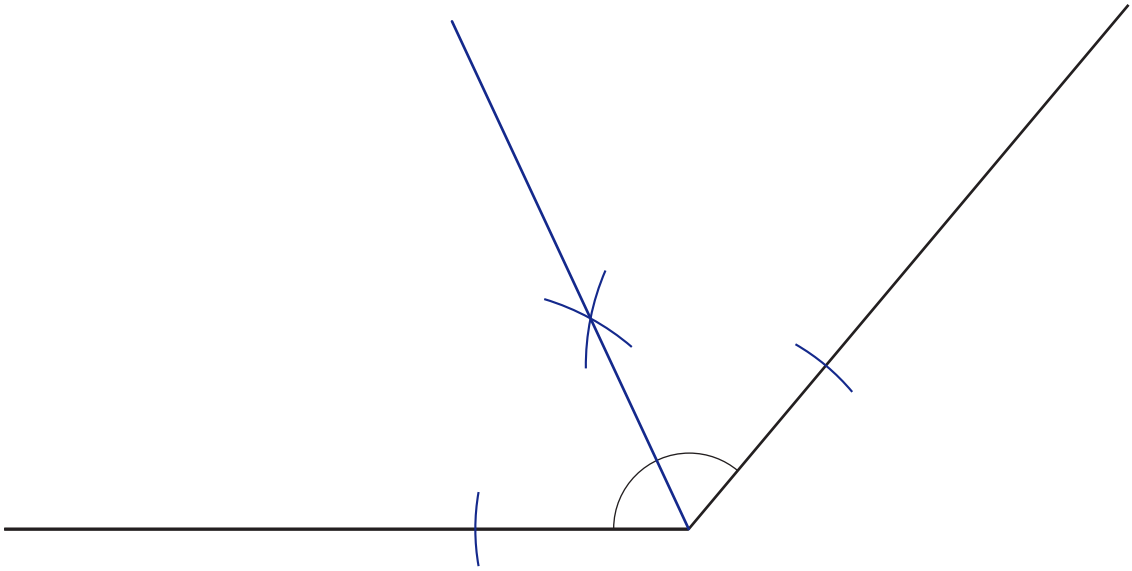
Angles in a triangle add up to 180°

Sum = 6 × 180° = 1080°

Answer 1080 ° [3]

15 Use a ruler and compasses to construct the bisector of the angle.

You must show all your construction arcs.



[2]

[Turn over

16 Jan asks some delivery drivers how much money they spend on fuel each week.

The results are shown below.

Amount, £A	Frequency
$0 < A \leqslant 40$	12
$40 < A \leqslant 80$	18
$80 < A \leqslant 120$	26
$120 < A \leqslant 160$	27
$160 < A \leqslant 200$	17

There are 2000 delivery drivers in the area.

Estimate how many delivery drivers in the area spend over £160 on fuel each week.

Show your working out clearly.

Total = 12 + 18 + 26 + 27 + 17 = 100 drivers

17 out of 100 spend over £160

$\frac{17}{100} \times 2000 = 17 \times 20 = 340$

Answer 340 [2]

17 A college has 270 students.

120 of the students are male.

The probability that a male student plays sport is $\frac{7}{20}$

The probability that a female student plays sport is 0.4

What **fraction** of the students who play sport are male?

Male: $\frac{7}{20} \times 120 = 7 \times 6 = 42$ play sport

Female: $270 - 120 = 150$ students

$0.4 \times 150 = 60$ play sport

Total playing sport $= 42 + 60 = 102$

Fraction male $= \frac{42}{102} = \frac{21}{51} = \frac{7}{17}$

Answer $\frac{7}{17}$ [4]

[Turn over

18 **(a)** Explain why 105001 is not a binary number.

Answer *it has a 5; binary numbers only use the digits 0 and 1* [1]

(b) Write the number 23 as a binary number.

$23 = 16 + 4 + 2 + 1$

16	8	4	2	1
1	0	1	1	1

Answer *10111* [1]

(c) Jim says that the binary number 110001 is a square number when it is changed into a decimal number.

Is Jim correct?

Show your working out clearly.

32	16	8	4	2	1
1	1	0	0	0	1

$110001 = 32 + 16 + 1 = 49$

$49 = 7 \times 7 = 7^2$

Answer *Yes* because *$110001 = 49 = 7^2$, a square number* [2]

19 The first 6 terms in sequence P are

3, 5, 7, 9, 11, 13, …

The first 6 terms in sequence Q are

1, 5, 9, 13, 17, 21, …

Joanne adds the first term of sequence P to the first term of sequence Q.

She adds the second term of sequence P to the second term of sequence Q.

She continues in this way to produce a new sequence.

(a) Write down the nth term for this new sequence.

New sequence: 4, 10, 16, 22, 28, 34, …

Goes up by 6 each time, so 6n

6 × 1 = 6, 6 − 2 = 4

Answer 6n − 2 [2]

(b) Find the 20th term for this new sequence.

6 × 20 − 2 = 120 − 2 = 118

Answer 118 [1]

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For Examiner's use only	
Question Number	**Marks**
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Examiner Number

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