Rewarding Learning

Centre Number

Candidate Number

General Certificate of Secondary Education
2019

Mathematics

StemUp Model Solution

Unit M6 Paper 1
(Non-Calculator)
Foundation Tier



[GMC61]

GMC61

THURSDAY 6 JUNE, 9.15am–10.15am

TIME

1 hour.

INSTRUCTIONS TO CANDIDATES

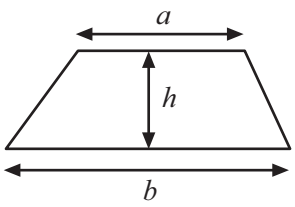
Write your Centre Number and Candidate Number in the spaces provided at the top of this page.
You must answer the questions in the spaces provided.
Do not write outside the boxed area on each page, on blank pages or tracing paper.
Complete in black ink only. **Do not write with a gel pen.**
Answer **all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

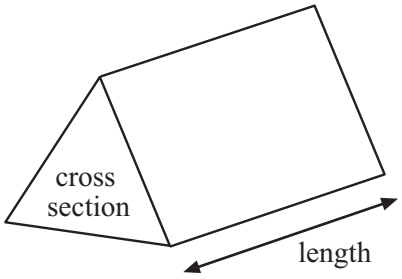
The total mark for this paper is 50.
Figures in brackets printed down the right-hand side of pages indicate the marks awarded to each question or part question.
You should have a ruler, compasses and a protractor.
The Formula Sheet is on page 2.

Formula Sheet

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



Volume of prism = area of cross section × length



stemup.co.uk

1 Anna buys these items for lunch.

Chicken Sandwich	£2.95
Banana	£0.89
Cup of coffee	£1.75
Bottle of water	£1.20

She pays with a £10 note.

She gets £2.21 change.

Is this change correct?

Show your working out.

£2.95
£0.89
£1.75
+ £1.20
£6.79

Total = £6.79

Change = £10.00 − £6.79
= £3.21

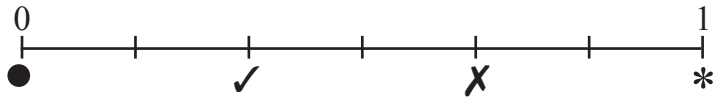
Check: £6.79 + £2.21 = £9.00
so she is £1 short

Answer No because the change should be £3.21, not £2.21 [3]

[Turn over



2



One letter is taken at random from the word COMMON.

Which of ●, ✓, ✗, * shows the probability that the letter is

(a) M, $P(M) = \frac{2}{6} = \frac{1}{3}$ Answer ✓ [1]

(b) T, $P(T) = 0$ Answer ● [1]

(c) a letter that appears twice in COMMON, M, O: $\frac{4}{6} = \frac{2}{3}$ Answer ✗ [1]

(d) a letter in the word MONOCLE? $P = 1$ Answer * [1]

3 **(a)** Fill in the next two terms of this sequence.

14, 13, 11, 8, [4], [−1] [2]

−1 −2 −3 −4 −5

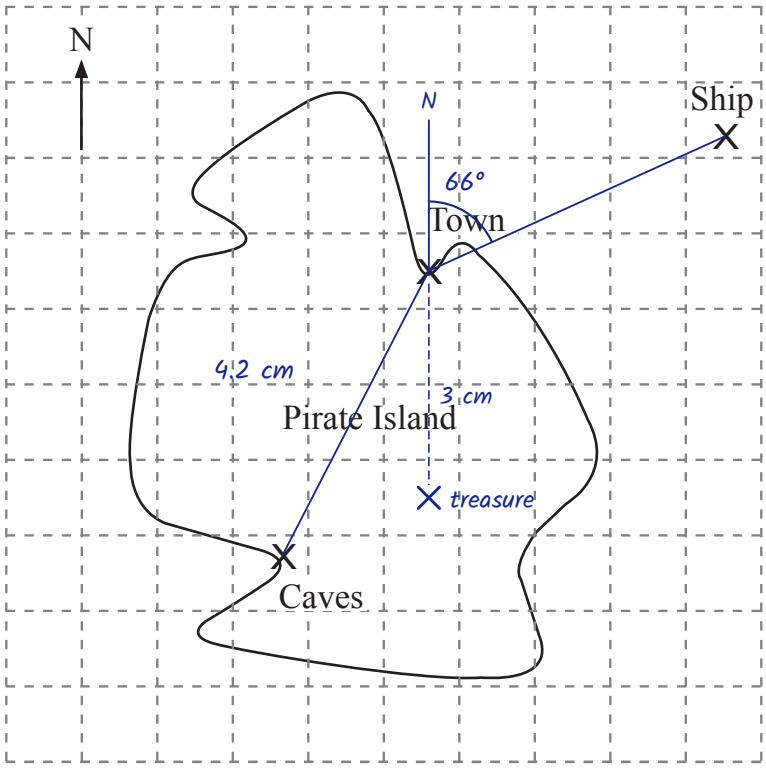
(b) Write down the name of the numbers in the sequence below.

1, 8, 27, 64, ...

1^3, 2^3, 3^3, 4^3

Answer Cube numbers [1]

4



SCALE
1 cm = 2 km

(a) Use the scale to find the distance from the town to the caves.

4.2 × 2 = 8.4

Answer 8.4 km [2]

(b) Mark, with an X, the position of the buried treasure which is 6 km due South of the town. [1]

(c) Measure and write down the bearing of the ship from the town.

bearing = 066°

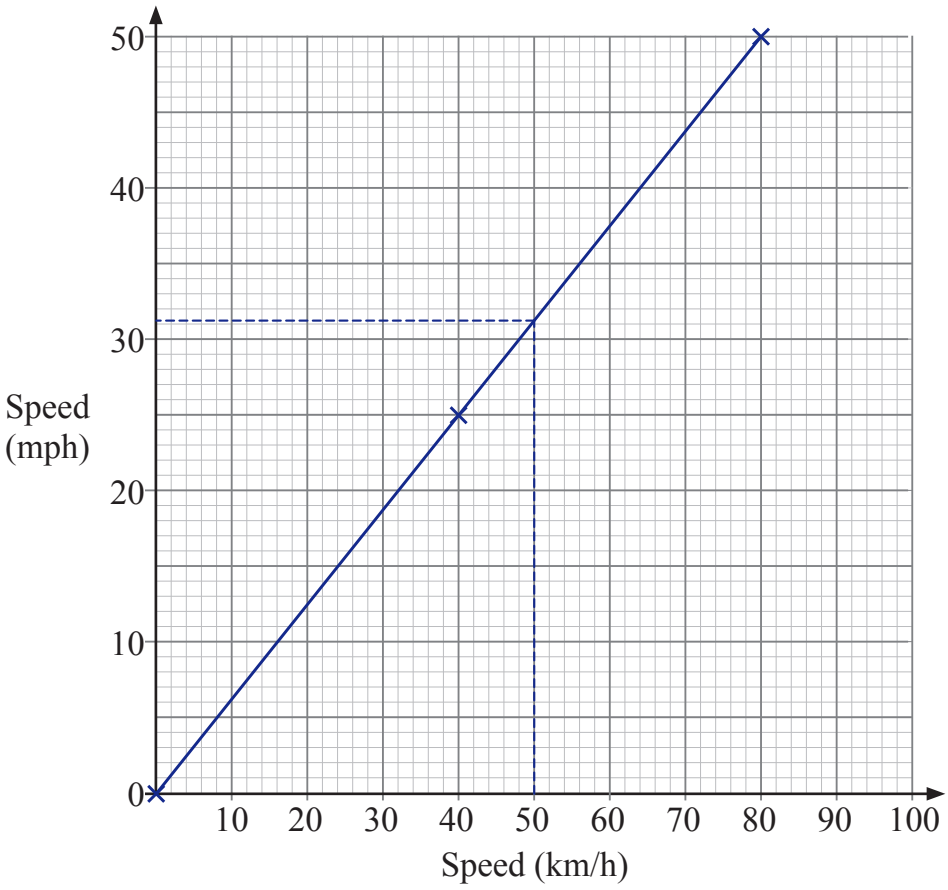
Answer 066 ° [2]

[Turn over

5 Speed can be measured in kilometres per hour (km/h) or miles per hour (mph).

(a) Use the values in the table to draw a conversion graph.

Speed (km/h)	0	40	80
Speed (mph)	0	25	50



[2]

(b) Jonah is travelling at 50 km/h.

Is he breaking the 30 mph speed limit?

You **must use** your graph to help explain your answer clearly.

Answer *Yes* because *50 km/h is about 31 mph on the graph, which is more than the 30 mph speed limit* [1]

6 Tom bought a full bag of coal.

After one week the bag was $\frac{2}{3}$ full.

During the next week he used $\frac{1}{4}$ of the remaining coal.

What fraction was left in the bag?

Used in week 2: $\frac{1}{4} \times \frac{2}{3} = \frac{2}{12} = \frac{1}{6}$

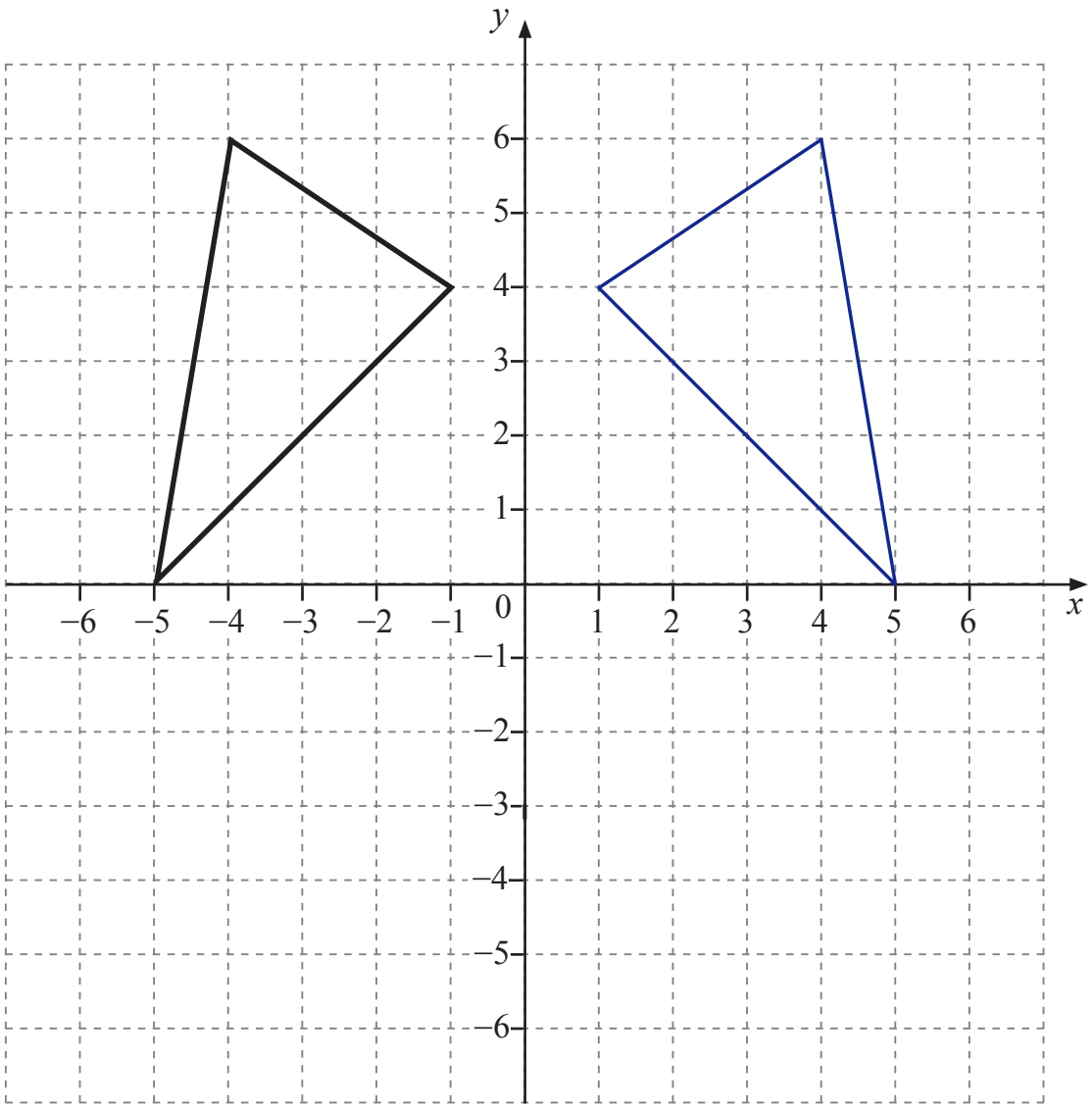
Left: $\frac{2}{3} - \frac{1}{6} = \frac{4}{6} - \frac{1}{6} = \frac{3}{6} = \frac{1}{2}$

(or $\frac{3}{4} \times \frac{2}{3} = \frac{6}{12} = \frac{1}{2}$)

Answer $\frac{1}{2}$ [2]

[Turn over

7 Reflect the triangle shown in the ***y*-axis**.



[1]

8 **(a)** Calculate the size of angle x.

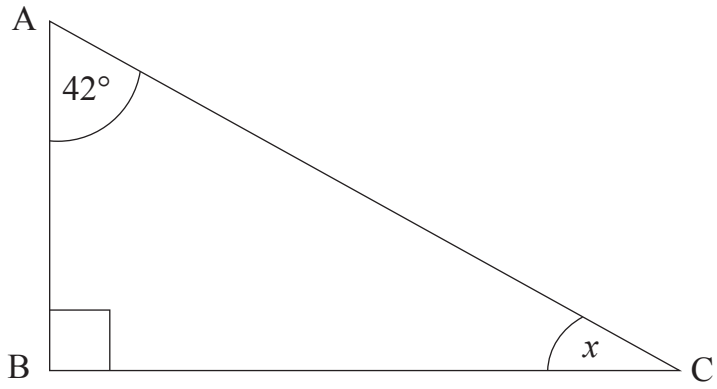


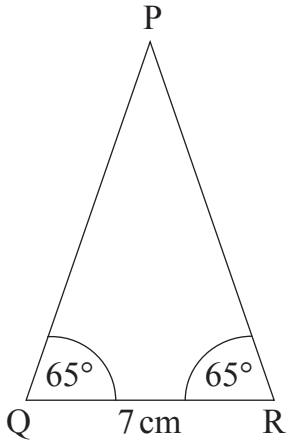
diagram not drawn accurately

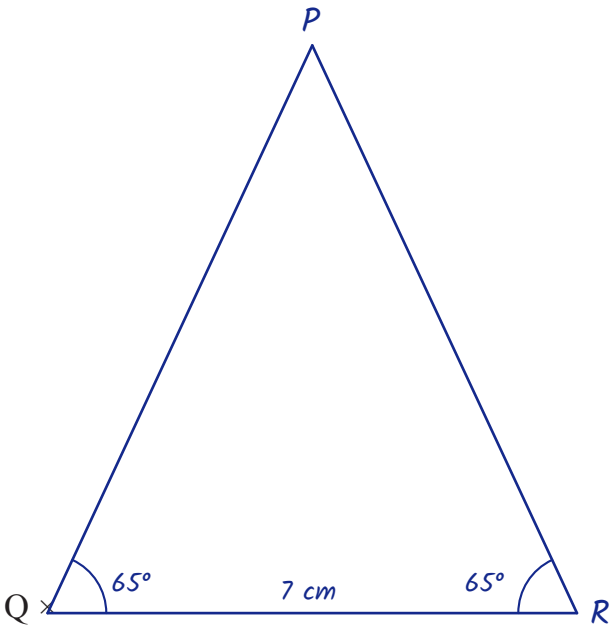
$x = 180 - 90 - 42$

$x = 48°$

Answer 48 ° [2]

(b) Make an accurate drawing of the triangle sketched below.





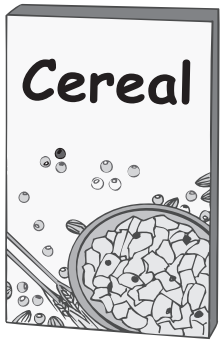
[3]

[Turn over

9 A machine fills boxes of breakfast cereal.

Each box should weigh 375 g.

Jason takes 100 boxes and tests the accuracy of the machine by weighing them.



Weight (g)	Less than 375	Exactly 375	More than 375
Number of boxes	9	58	33

(a) What is the probability that one of the boxes taken by Jason weighs less than 375 g?

Answer $\frac{9}{100}$ [1]

(b) The machine fills 5000 boxes.

Calculate the number of boxes you would expect to weigh less than 375 g.

$\frac{9}{100} \times 5000 = 9 \times 50 = 450$

Answer 450 [2]

10 Rewrite $4 + x = 9 - y$ to make y the subject.

Give your answer in its simplest form.

$4 + x = 9 - y$
$y + 4 + x = 9$
$y = 9 - 4 - x$
$y = 5 - x$

Answer $y =$ $5 - x$ [2]

11





The two rectangles above have the same area.

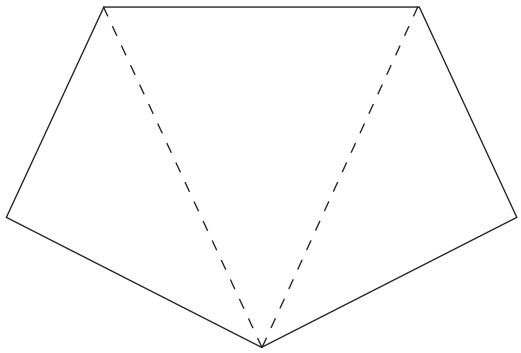
Using estimation, work out an estimate for the length, L, of the second rectangle.

$197 \approx 200, \quad 33 \approx 30, \quad 54 \approx 50$
Area $\approx 200 \times 30 = 6000\ cm^2$
$L \approx 6000 \div 50 = 120$

Answer L= 120 cm [2]

[Turn over

12



(a) (i) What is the total of all the angles in the three triangles shown?

$3 \times 180 = 540$

Answer 540 ° [1]

(ii) What is the sum of the interior angles of a five-sided polygon?

same as the 3 triangles

Answer 540 ° [1]

(b) What is the sum of the interior angles of a seven-sided polygon?

7 sides → 5 triangles
$5 \times 180 = 900$

Answer 900 ° [2]

13 Solve

$$8x < 6x + 7$$

$8x - 6x < 7$

$2x < 7$

$x < \frac{7}{2}$

$x < 3.5$

Answer $x < 3.5$ [2]

14 **(a)** Write the binary number 10101 as a decimal number.

16 8 4 2 1

1 0 1 0 1

16 + 4 + 1 = 21

Answer 21 [1]

(b) Write the decimal number 26 as a binary number.

26 = 16 + 8 + 2

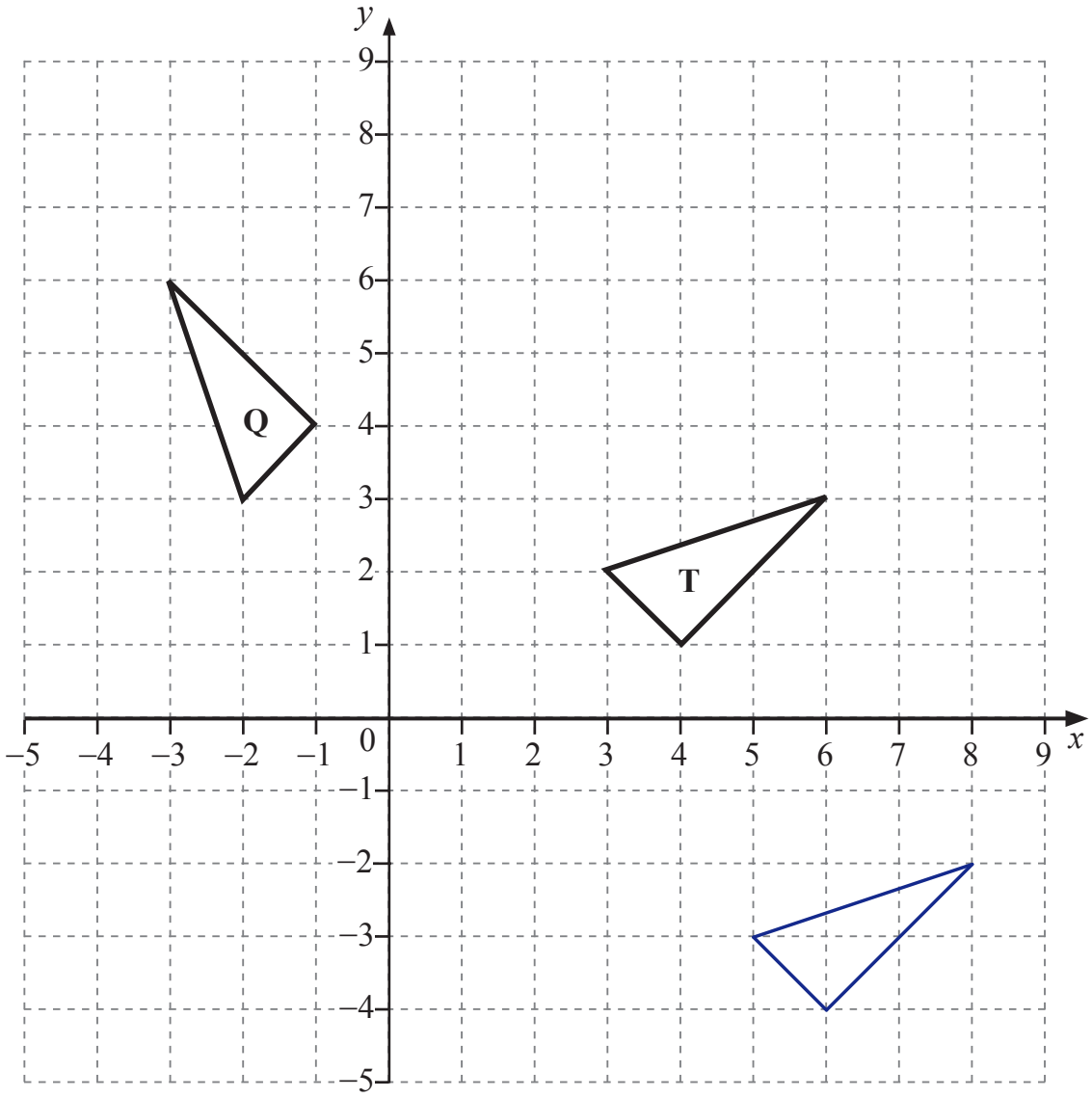
16 8 4 2 1

1 1 0 1 0

Answer 11010 [1]

[Turn over

15



(a) Describe fully the **single** transformation which maps triangle **T** onto triangle **Q**.

Answer *Rotation, 90° anticlockwise, about (0, 0)* [3]

(b) On the grid, draw the image of triangle **T** after a translation $\begin{pmatrix} 2 \\ -5 \end{pmatrix}$. [2]

16 A six-sided dice is rolled 800 times.

The table below shows the relative frequency of scoring a six after different numbers of rolls.

Number of rolls	Relative frequency of a six
100	0.3
200	0.26
300	0.27
500	0.23
800	0.25

(a) How many times was a six scored after 300 rolls?

Show how you obtained your answer.

$0.27 \times 300 = 27 \times 3 = 81$

Answer 81 [2]

(b) How many sixes would you expect to get if a **fair** six-sided dice was rolled 300 times?

$P(six) = \frac{1}{6}$

$\frac{1}{6} \times 300 = 300 \div 6 = 50$

Answer 50 [2]

THIS IS THE END OF THE QUESTION PAPER

DO NOT WRITE ON THIS PAGE

For Examiner's use only	
Question Number	**Marks**
1	
2	
3	
4	
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10	
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12	
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16	
Total Marks	

Examiner Number

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