Rewarding Learning

Centre Number

Candidate Number

General Certificate of Secondary Education
2024

Mathematics

StemUp Model Solution

Unit M6 Paper 2
(With calculator)
Foundation Tier



[GMC62]

GMC62

MONDAY 3 JUNE, 10.45 am – 11.45 am

TIME

1 hour.

INSTRUCTIONS TO CANDIDATES

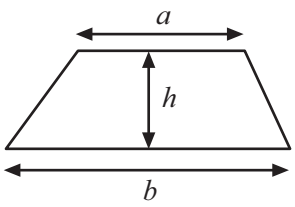
Write your Centre Number and Candidate Number in the spaces provided at the top of this page.
You must answer the questions in the spaces provided.
Do not write outside the boxed area on each page, on blank pages or tracing paper.
Complete in black ink only. **Do not write with a gel pen.**
Answer **all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

INFORMATION FOR CANDIDATES

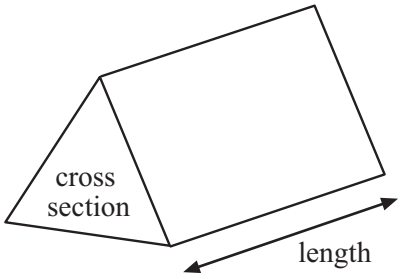
The total mark for this paper is 50.
Figures in brackets printed down the right-hand side of pages indicate the marks awarded to each question or part question.
You should have a calculator, ruler, compasses and a protractor.
The Formula Sheet is on page 2.

Formula Sheet

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



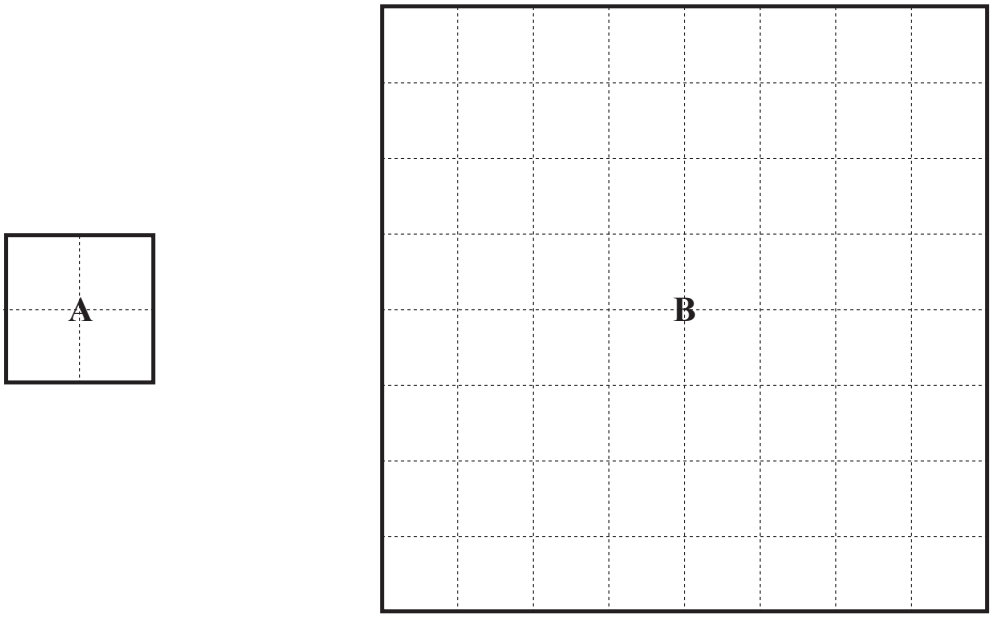
Volume of prism = area of cross section × length



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1 **(a)** Square **A** has been enlarged to Square **B**.

What is the scale factor of the enlargement?

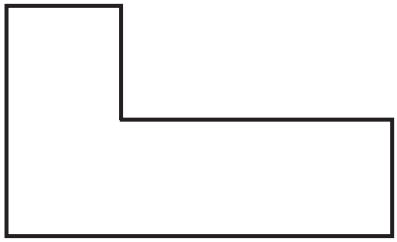


Side of A = 2 squares, side of B = 8 squares
8 ÷ 2 = 4

Answer _____4_____ [1]

[Turn over

(b) Sammy enlarges the shape below.



This is Sammy's enlargement.



Which statement is correct?

A Sammy's enlargement is correct.

B We can't tell if Sammy's enlargement is correct as we don't know the scale factor used.

C Sammy's enlargement is incorrect.

Answer C [1]

The whole shape is doubled but the top part is not, so the sides are not all × the same scale factor

2 Morgan wants to have a heavy package delivered 28 miles.

She has two options.

Deliver it there
£35 for up to 20 miles, and £2.50 per extra mile

Ready to go local
£42.50, plus £9.50 for distances between 25 miles and 40 miles

Which is the cheaper option and by how much?

Deliver it there: 28 − 20 = 8 extra miles
35 + 8 × 2.50 = 35 + 20 = £55
Ready to go local: 28 is between 25 and 40
42.50 + 9.50 = £52
55 − 52 = £3

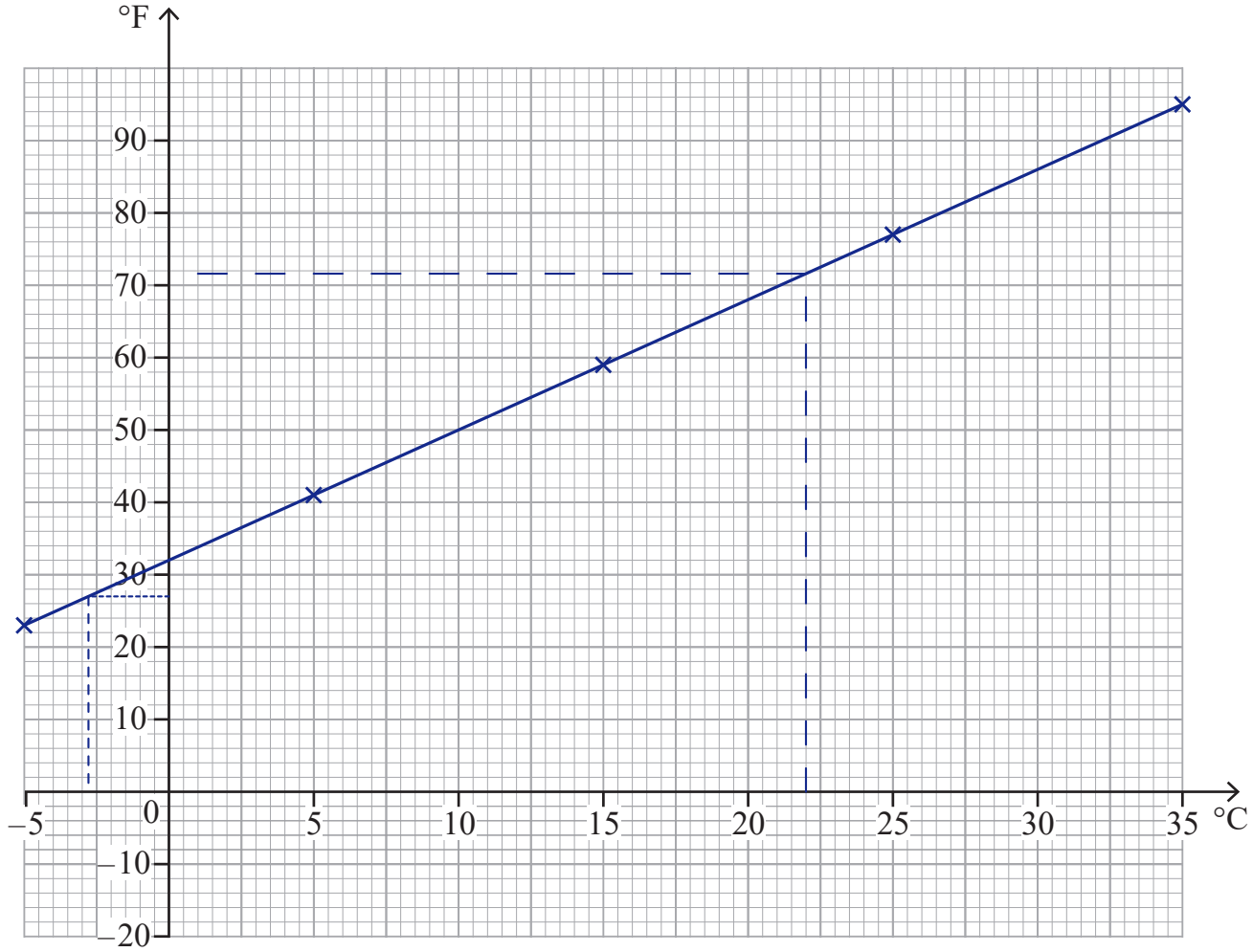
Answer _____*Ready to go local*_____ is cheaper by _____*£3*_____ [4]

[Turn over

3 (a)

°C	–5	5	15	25	35
°F	23	41	59	77	95

Use the table to draw the conversion graph from °C (centigrade) to °F (Fahrenheit) on the grid below. [3]



(b) Use your graph to convert 22 °C to °F.

Answer 72 °F [1]

(c) Use your graph to convert 27 °F to °C.

Answer –3 °C [1]

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

divide by 3 and then subtract 5

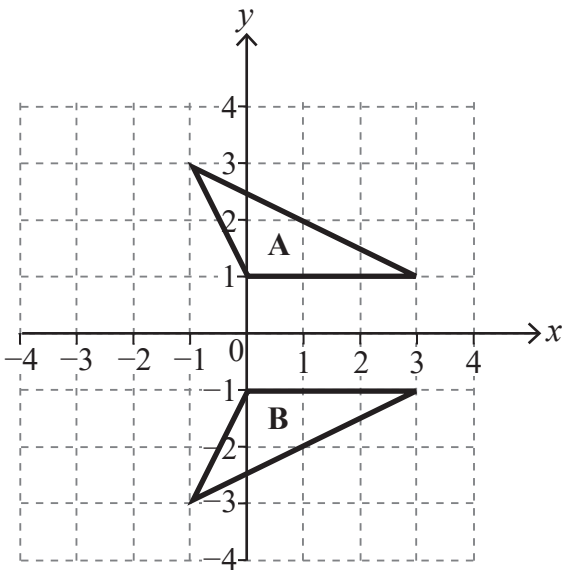
Find the next two numbers in this sequence.

24, 3 , −4

24 ÷ 3 = 8, 8 − 5 = 3
3 ÷ 3 = 1, 1 − 5 = −4

[2]

5 Describe fully the **single** transformation that takes triangle **A** to triangle **B**.



Answer Reflection in the x-axis [2]

[Turn over

6



Source: © Getty Images

Pete is filling 5-litre petrol cans from a large tank of petrol.

The tank contains 16 gallons.

Pete knows that 1 gallon = 4.5 litres.

How many 5-litre cans does he need to empty the tank?

16 × 4.5 = 72 litres
72 ÷ 5 = 14.4 cans
14 cans is not enough, so he needs 15 cans

Answer 15 cans [2]

7 Jack ran 4 km each day during the month of June.

He thinks he has run the length of 3 marathons.

A marathon is 26.2 miles long.

Is he right?

Explain your answer.

June has 30 days: 4 × 30 = 120 km
3 marathons = 26.2 × 3 = 78.6 miles
1 mile = 1.6 km: 78.6 × 1.6 = 125.76 km
120 km < 125.76 km
125.76 − 120 = 5.76 km short

Answer No because he has only run 120 km but 3 marathons are 125.76 km, so he needs to run 5.76 km more [4]

[Turn over

8 The heights (in cm) of students in a Year 1 class are recorded in the table below.

	$90 \leqslant h < 95$	$95 \leqslant h < 100$	$100 \leqslant h < 110$
Girl	6	5	2
Boy	4	7	6

A student is taken at random from the class.

(a) What is the probability of taking

(i) a girl with height $100 \leqslant h < 110$,

Answer $\frac{2}{30}$ [1]

(ii) a boy,

$4 + 7 + 6 = 17$

Answer $\frac{17}{30}$ [1]

(iii) a student with height $90 \leqslant h < 95$,

$6 + 4 = 10$

Answer $\frac{10}{30}$ [1]

(iv) a girl with height $90 \leqslant h < 100$?

$6 + 5 = 11$

Answer $\frac{11}{30}$ [1]

Total = 6 + 5 + 2 + 4 + 7 + 6 = 30 students

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(b) An event is held for Year 1 students.

600 Year 1 students attend.

Estimate how many of the students have height $100 \leqslant h < 110$

Girls and boys $100 \leqslant h < 110$: $2 + 6 = 8$

$\frac{8}{30} \times 600 = 160$

Answer 160 [2]

[Turn over

9 The number of oysters collected by divers for a number of dives is recorded.

Name	Number of dives	Number of oysters collected
Diving Dan	16	84
Scuba Sam	11	33
Clammy Colin	24	102

Which diver is the best at collecting oysters?

Show your working clearly.

Dan: 84 ÷ 16 = 5.25 oysters per dive

Sam: 33 ÷ 11 = 3 oysters per dive

Colin: 102 ÷ 24 = 4.25 oysters per dive

Answer Diving Dan

because he collects the most oysters per dive (5.25) [2]

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10 Work out the value of x in the pentagon below.

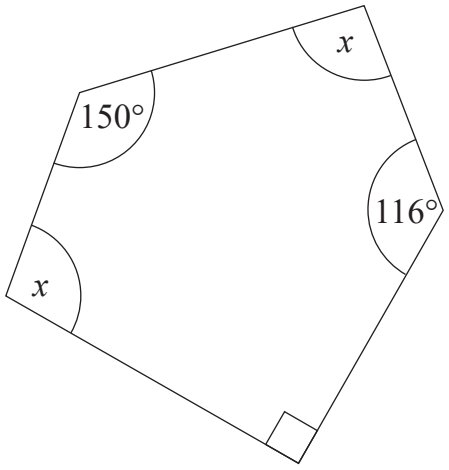


diagram not drawn accurately

Sum of angles in a pentagon = (5 − 2) × 180 = 540°

540 − 150 − 116 − 90 = 184

2x = 184

x = 184 ÷ 2 = 92

Answer $x =$ 92 ° [4]

[Turn over

11 In a local election the following figures were recorded at three polling stations.

Station	Number who voted	Number registered to vote
A	645	1270
B	860	1548
C	1450	3015

Of the total number of those registered to vote, what percentage voted?

Total voted = 645 + 860 + 1450 = 2955

Total registered = 1270 + 1548 + 3015 = 5833

2955 ÷ 5833 × 100 = 50.660037...

= 50.66% (2 d.p.)

Answer 50.66 % [3]

12 Tammy makes cordial using fruit juice and sparkling water in the ratio 1:3

Tammy has 800 ml of fruit juice and 2100 ml of sparkling water.

What is the greatest amount of cordial she can make?

800 ml fruit juice needs 800 × 3 = 2400 ml water
She only has 2100 ml water, so water limits it
2100 ml water needs 2100 ÷ 3 = 700 ml fruit juice
700 + 2100 = 2800 ml

Answer *2800* ml [3]

[Turn over

13 Sarah rolls a fair dice and tosses a fair coin.

What is the probability that she gets a number less than 5 and a Head?

Show your working out.

Outcomes: H1 H2 H3 H4 H5 H6
T1 T2 T3 T4 T5 T6 (12 outcomes)
Less than 5 and a Head: H1, H2, H3, H4 (4 outcomes)

$P = \frac{4}{12} = \frac{1}{3}$

Answer $\frac{1}{3}$ [2]

14 $x^a \times x^4 = x^{12}$

Find the value of a.

$x^{a+4} = x^{12}$
$a + 4 = 12, \quad a = 12 - 4 = 8$

Answer $a =$ 8 [1]

15 The equation $x^3 - 12x - 2 = 0$ has a solution between 2 and 5

Use a trial and improvement method to find this solution, correct to one decimal place.

You must show all your working.

x	$x^3 - 12x - 2$	
3	−11	too small
4	14	too big
3.5	−1.125	too small
3.6	1.456	too big
3.55	0.138875	too big

Solution is between 3.5 and 3.55, so x = 3.5 (1 d.p.)

Answer $x =$ 3.5 [4]

[Turn over

16 There are 200 students in Year 8 and 160 students in Year 9

There are 120 girls in Year 8 and 100 girls in Year 9

The probability that a girl plays a musical instrument is 0.3

The probability that a boy plays a musical instrument is 0.25

A student is taken at random from the students who play a musical instrument.

What is the probability that it is a boy?

Boys: Year 8 = 200 − 120 = 80, Year 9 = 160 − 100 = 60

Girls who play = 0.3 × (120 + 100) = 0.3 × 220 = 66

Boys who play = 0.25 × (80 + 60) = 0.25 × 140 = 35

Total who play = 66 + 35 = 101

$P(\text{boy}) = \frac{35}{101}$

Answer $\frac{35}{101}$ [4]

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Question Number	**Marks**
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Examiner Number

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