Rewarding Learning

Centre Number

Candidate Number

General Certificate of Secondary Education
2019

Mathematics

StemUp Model Solution

Unit M6 Paper 2
(With calculator)
Foundation Tier



[GMC62]

GMC62

THURSDAY 6 JUNE, 10.45am–11.45am

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 fifteen** 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.

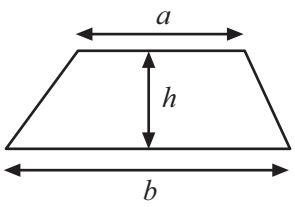
INFORMATION FOR CANDIDATES

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.

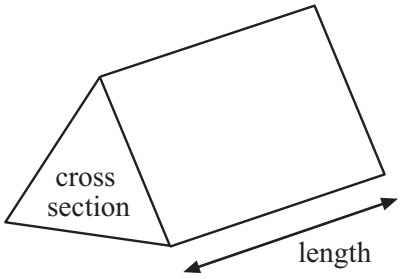
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Formula Sheet

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



Volume of prism = area of cross section × length



11944

1 Part of the sequence of triangular numbers is shown.

… 21, 28, 36, 45, 55, 66 …

(a) Which triangular number comes directly before 21?

21 − 6 = 15

Answer 15 [1]

(b) Write down the smallest triangular number which is greater than 100

66, 78, 91, 105

Answer 105 [1]

[Turn over

2 **(a)** **(i)** Joe has 12 pints of oil.

How many litres is this?

Use 1 pint = 0.568 litres.

$12 \times 0.568 = 6.816$

Answer 6.816 litres [2]

(ii) Jan has 15 litres of oil.

How many pints is this?

$15 \div 0.568 = 26.40845...$

Answer 26.4 pints [2]

(b) Explain how to change a weight in pounds into kilograms.

Divide the weight in pounds by 2.2
(1 kg ≈ 2.2 lb, so kg = pounds ÷ 2.2)

[2]

3 Tickets numbered from 1 to 81 are placed in a hat.
One winning ticket is taken at random.

(a) What is the probability that the winning ticket is the number 70?

Answer $\frac{1}{81}$ [1]

(b) What is the probability that the winning ticket is a number bigger than 70?

Numbers bigger than 70: 71 to 81 = 11 numbers

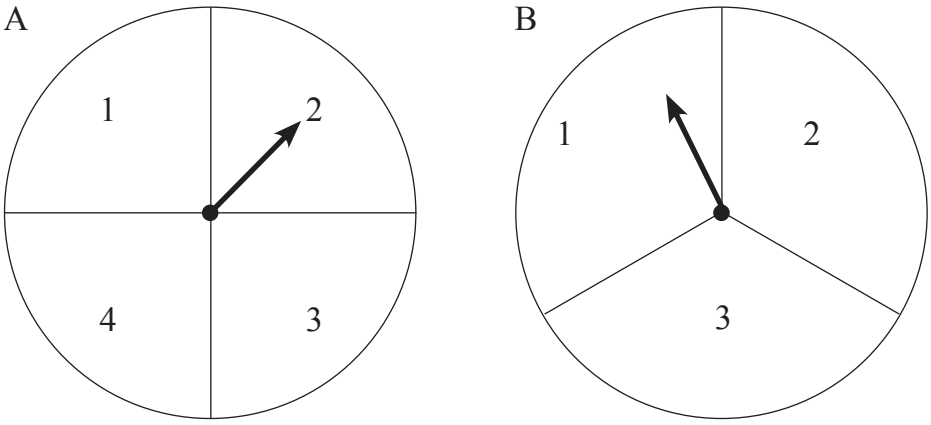
Answer $\frac{11}{81}$ [2]

(c) Explain why the probability of the winning ticket having an even number is not $\frac{1}{2}$

There are 41 odd numbers but only 40 even numbers (not equal) [1]

[Turn over

4



Spinners A and B are each spun once.

(a) Complete the table to show all the possible outcomes.

Spinner A \ Spinner B	**1**	**2**	**3**
1	1, 1	1, 2	1, 3
2	2, 1	2, 2	2, 3
3	3, 1	3, 2	3, 3
4	4, 1	4, 2	4, 3

[1]

(b) What is the probability of getting the same number on each spinner?

(1,1) (2,2) (3,3) = 3 outcomes

Answer $\frac{3}{12}$ [1]

(c) What is the probability of getting a bigger number on A than B?

(2,1) (3,1) (3,2) (4,1) (4,2) (4,3) = 6 outcomes

Answer $\frac{6}{12}$ [1]

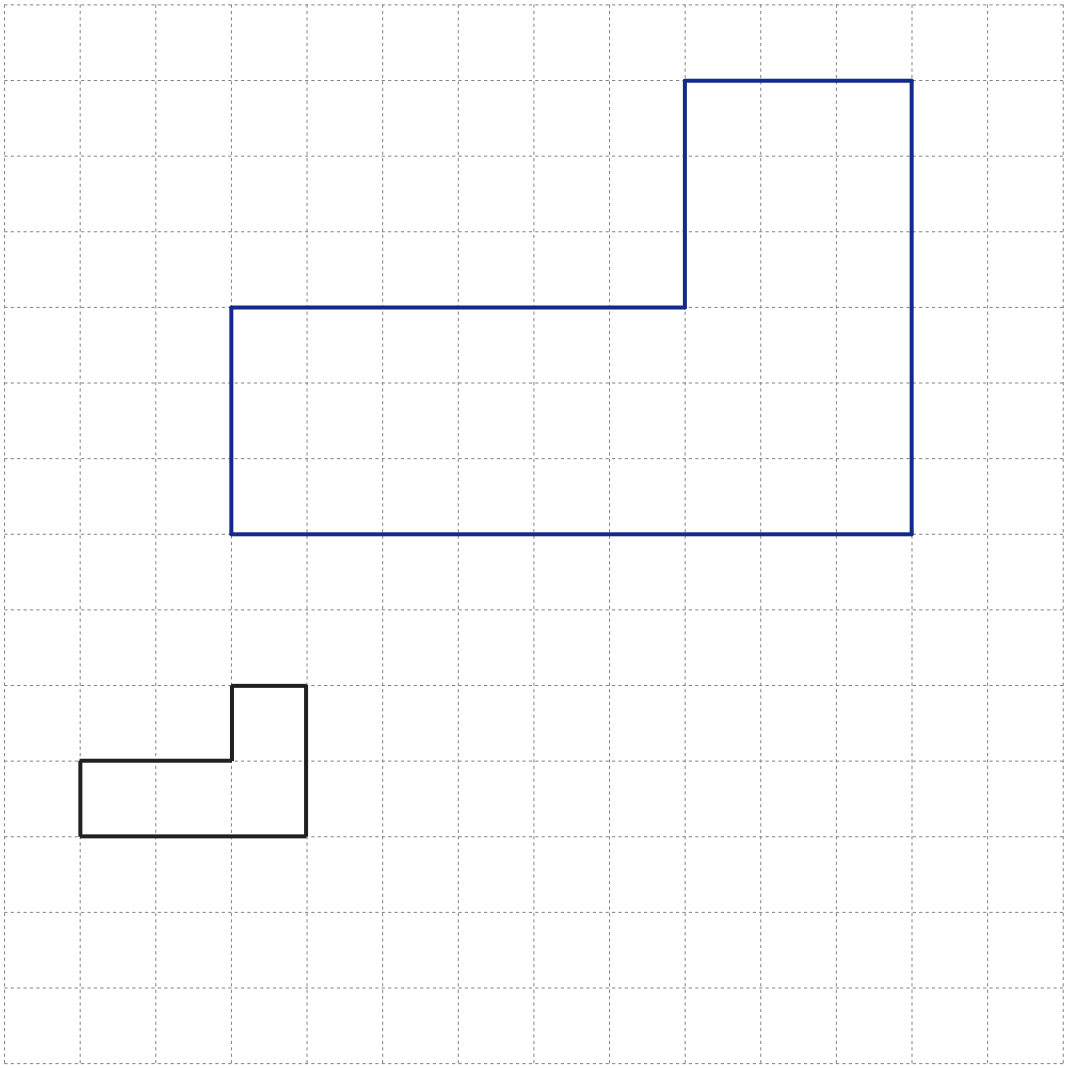
5 In a choir there are 36 female and 24 male singers.

Write down the ratio of female to male singers in its simplest form.

36 : 24 (÷ 12)

Answer 3 : 2 [2]

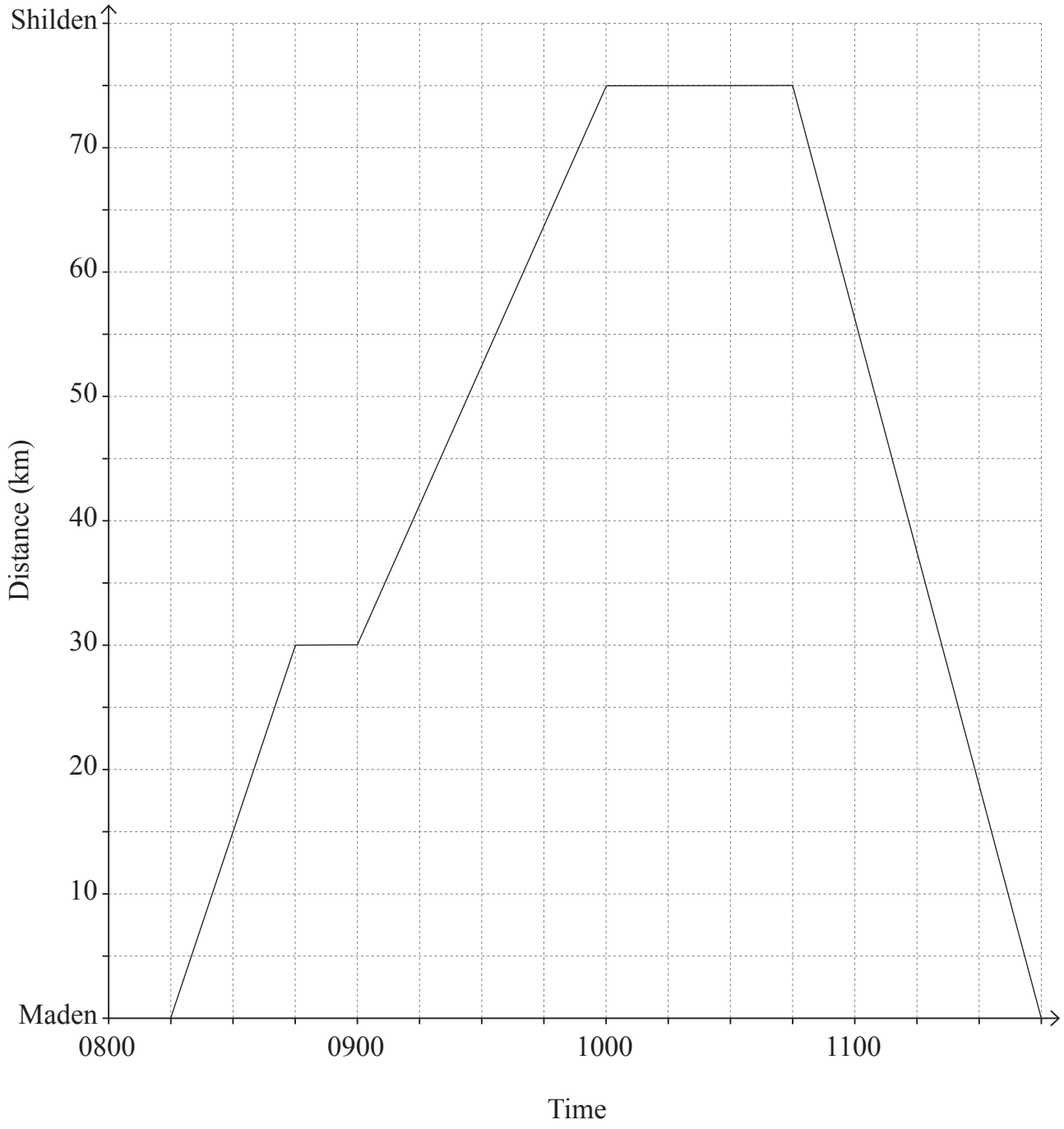
6 Enlarge the shape by scale factor 3



[2]

[Turn over

7 The graph shows Ryan's journey from Maden to Shilden and back to Maden.



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(a) During the total journey, for how long was Ryan not moving?

0845 to 0900 = 15 min, 1000 to 1045 = 45 min

Answer 60 minutes [1]

(b) How far is Ryan from Maden at 0930?

halfway between 30 km and 75 km

Answer 52.5 km [1]

(c) Calculate the average speed for the whole journey.

State the units of your answer.

Distance = 75 + 75 = 150 km
Time = 0815 to 1145 = 3.5 hours
Speed = 150 ÷ 3.5 = 42.857...

Answer 42.9 km/h [3]

[Turn over

8 There are 32 pupils in a class and all were present on Monday.

On Monday the teacher asked each pupil their favourite colour.

She recorded the results for green, blue and yellow accurately in a table.

	Green	**Blue**	**Yellow**	**Total**
Girls	3	5	4	12
Boys	4	7	2	13
Total	7	12	6	25

(a) Give a reason why the total number of boys and girls in the table is not 32

7 pupils picked other colours (not green, blue or yellow) [1]

(b) There are 18 girls in the class.

What is the probability that a girl said the colour blue?

Answer $\frac{5}{18}$ [1]

(c) What is the probability that a pupil in the class **did not** say green?

32 – 7 = 25 did not say green

Answer $\frac{25}{32}$ [1]

9

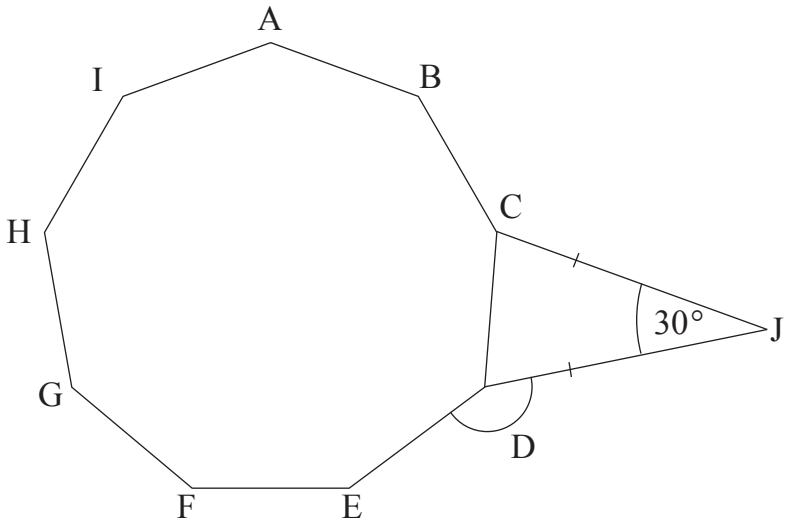


diagram not drawn accurately

The diagram shows a regular nonagon ABCDEFGHI with an isosceles triangle DCJ attached.

The angle DJC = 30°

Calculate the size of the angle EDJ.

Show your working clearly.

Triangle DCJ is isosceles: angle JDC = (180° − 30°) ÷ 2 = 75°
Exterior angle of nonagon = 360° ÷ 9 = 40°
Interior angle CDE = 180° − 40° = 140°
Angles at a point: EDJ = 360° − 140° − 75° = 145°

Answer 145 ° [4]

[Turn over

10 Sue bought 100 ml of suncream for £5.40 in Belfast.

While in Spain she bought 150 ml of suncream for 8.80 euro.

The exchange rate was £1 = 1.07 euro.

Was it better value in Belfast or in Spain?

Show your working.

Belfast: 100 ml costs £5.40
so 150 ml costs 5.40 ÷ 100 × 150 = £8.10
In euro: 8.10 × 1.07 = 8.667 euro
Spain: 150 ml costs 8.80 euro
8.67 euro < 8.80 euro, so Belfast is cheaper

Answer *Belfast* [5]

11 There are four possible results from a music examination.

Result	Fail	Pass	Credit	Distinction
Probability		$\frac{1}{2}$	$\frac{3}{10}$	$\frac{1}{20}$

The probabilities of some results are recorded in the table.

(a) What is the probability of fail?

$\frac{1}{2} + \frac{3}{10} + \frac{1}{20} = \frac{17}{20}$ $\quad 1 - \frac{17}{20} = \frac{3}{20}$

Answer $\frac{3}{20}$ [2]

(b) What is the probability of credit or distinction?

$\frac{3}{10} + \frac{1}{20} = \frac{6}{20} + \frac{1}{20} = \frac{7}{20}$

Answer $\frac{7}{20}$ [2]

12 Simplify $\frac{m^5 \times m^3}{m^2}$

$m^{5+3-2} = m^6$

Answer m^6 [1]

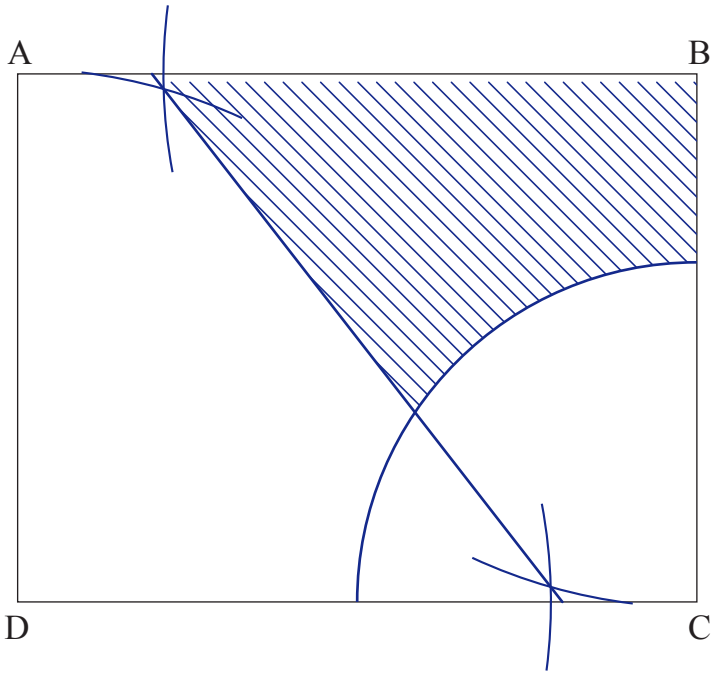
[Turn over

13 Work out the n^{th} term of the sequence 6, 3, 0, −3, ...

difference = −3, zero term = 6 + 3 = 9

Answer *9 − 3n* [2]

14



ABCD is a rectangle, with AB = 9 cm and BC = 7 cm.

Shade the region inside the rectangle which is the locus of all points that are

(i) greater than 4.5 cm from C

and **(ii)** nearer to B than D. [3]

15 Use trial and improvement to solve the equation $x^3 - 3x = 11$

Give your answer correct to one decimal place.

You must show your working

x	$x^3 - 3x$	
2	2	too small
3	18	too big
2.5	8.125	too small
2.6	9.776	too small
2.7	11.583	too big
2.65	10.659625	too small

2.65 is too small, so x is between 2.65 and 2.7

Answer 2.7 [4]

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	
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Total Marks	

Examiner Number

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