Rewarding Learning

Centre Number

Candidate Number

General Certificate of Secondary Education
2019

Mathematics

StemUp Model Solution

Unit M5 Paper 2
(With calculator)
Foundation Tier



[GMC52]

GMC52

THURSDAY 6 JUNE, 10.45am–11.45am

TIME

1 hour.

INSTRUCTIONS TO CANDIDATES

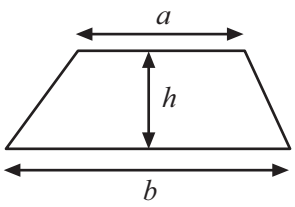
Write your Centre Number and Candidate Number in the spaces provided at the top of this page.
You must answer the questions in the spaces provided.
Do not write outside the boxed area on each page, on blank pages or tracing paper.
Complete in black ink only. **Do not write with a gel pen.**
Answer **all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

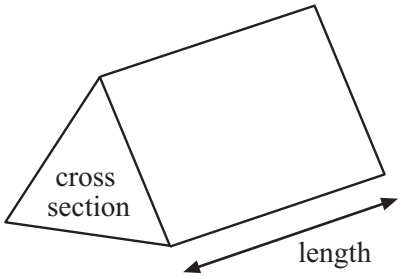
The total mark for this paper is 50.
Figures in brackets printed down the right-hand side of pages indicate the marks awarded to each question or part question.
You should have a calculator, ruler, compasses and a protractor.
The Formula Sheet is on page 2.

Formula Sheet

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

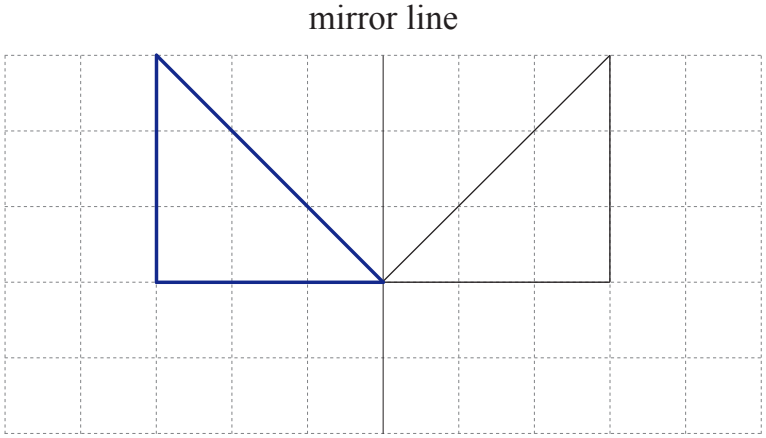


Volume of prism = area of cross section × length



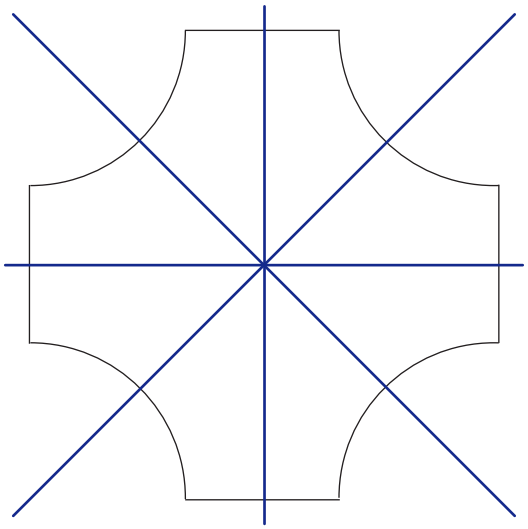
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1 **(a)** Reflect the triangle in the mirror line.



[2]

(b) Draw all the lines of symmetry on the shape below.



[2]

[Turn over

2 **(a)** Which **imperial** unit would be used to measure

(i) the distance from Enniskillen to Belfast,

Answer _____ *miles* _____ [1]

(ii) the capacity of a carton of milk?

Answer _____ *pints* _____ [1]

(b) Explain how to change pounds into kilograms.

Divide the number of pounds by 2.2
(1 kg ≈ 2.2 lb), e.g. 11 lb ÷ 2.2 = 5 kg

[2]

3 In Year 10

there are more boys than girls;
all pupils are 13 or 14 years old;
there are the same number of 13-year-olds as 14-year-olds;
everyone studies French.

One pupil is taken at random from Year 10

What is the probability that the pupil

(a) is a girl?

Circle the correct answer.

impossible | unlikely | evens | likely | certain [1]

(b) is 14 years old?

Circle the correct answer.

impossible | unlikely | evens | likely | certain [1]

(c) does **not** study French?

Circle the correct answer.

impossible | unlikely | evens | likely | certain [1]

[Turn over

4 **(a)** Jenny writes the first six square numbers as

2, 4, 9, 16, 25, 36

Explain why she is wrong.

Answer 2 is not a square number (the first is $1 = 1^2$) [1]

(b) Part of the sequence of triangular numbers is shown.

… 21, 28, 36, 45, 55, 66 …

(i) Which triangular number comes directly before 21?

$21 - 6 = 15$

Answer 15 [1]

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

66, 78, 91, 105

Answer 105 [1]

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5 **(a)** 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]

(b) Jan has 15 litres of oil.

How many pints is this?

$15 \div 0.568 = 26.40845...$

Answer 26.4 pints [2]

[Turn over

6 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?

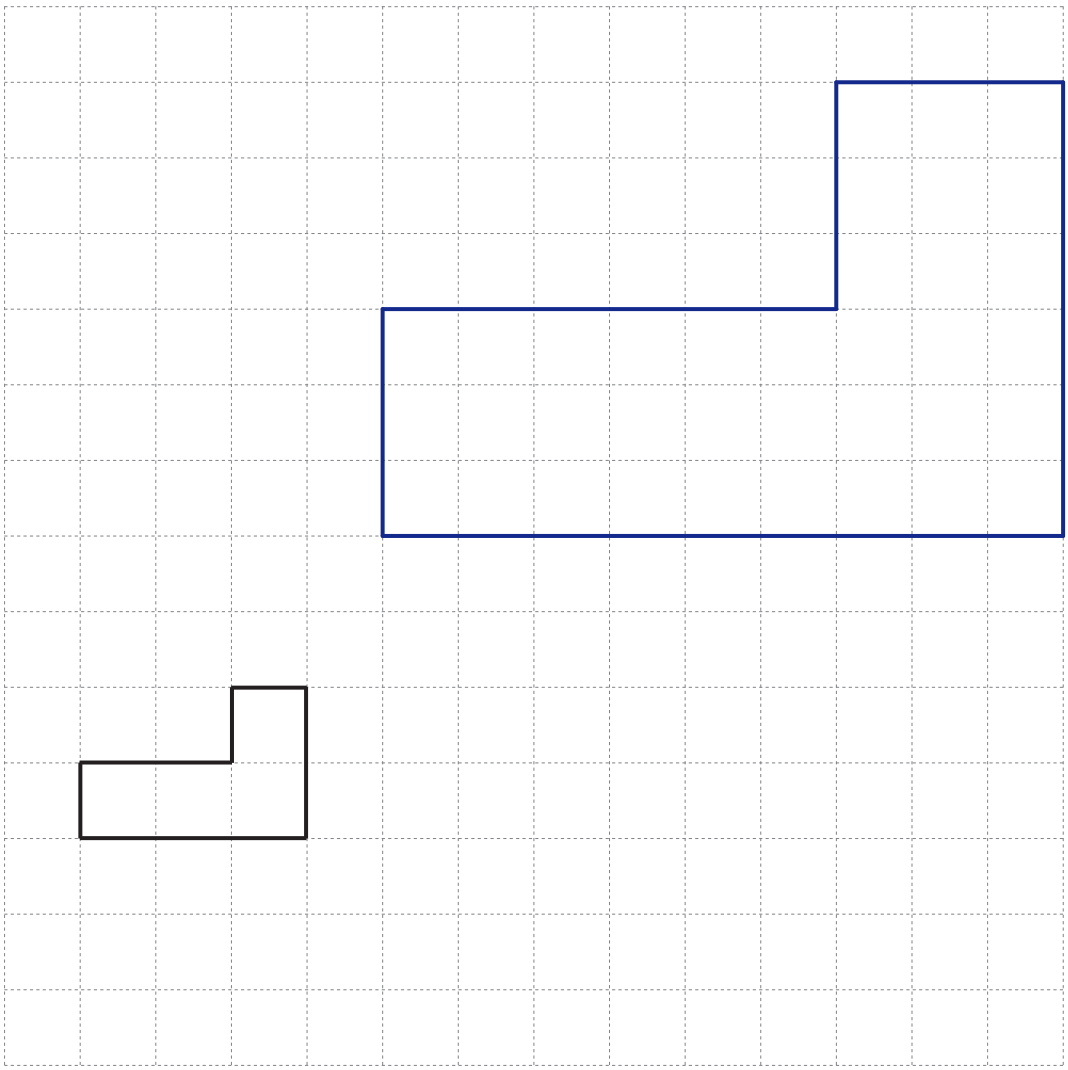
71 to 81 is 11 tickets

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

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

There is not an equal number of odd and even numbers (41 odd, 40 even) [1]

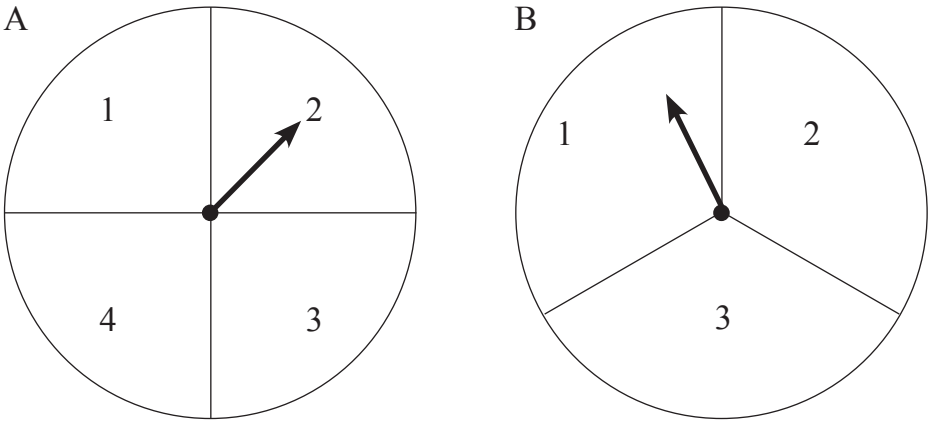
7 Enlarge the shape by scale factor 3



[2]

[Turn over

8



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) so 3 out of 12

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) so 6 out of 12

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

9 **(a)** 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
= 3 : 2 (÷ 12)

Answer 3 : 2 [2]

(b) There are 52 people in an orchestra.
The ratio of males to females is 3:1
Calculate the number of males and females in the orchestra.

3 + 1 = 4 parts
52 ÷ 4 = 13
males 3 × 13 = 39
females 1 × 13 = 13

Answer 39 males, 13 females [2]

[Turn over



10 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 a different colour (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

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

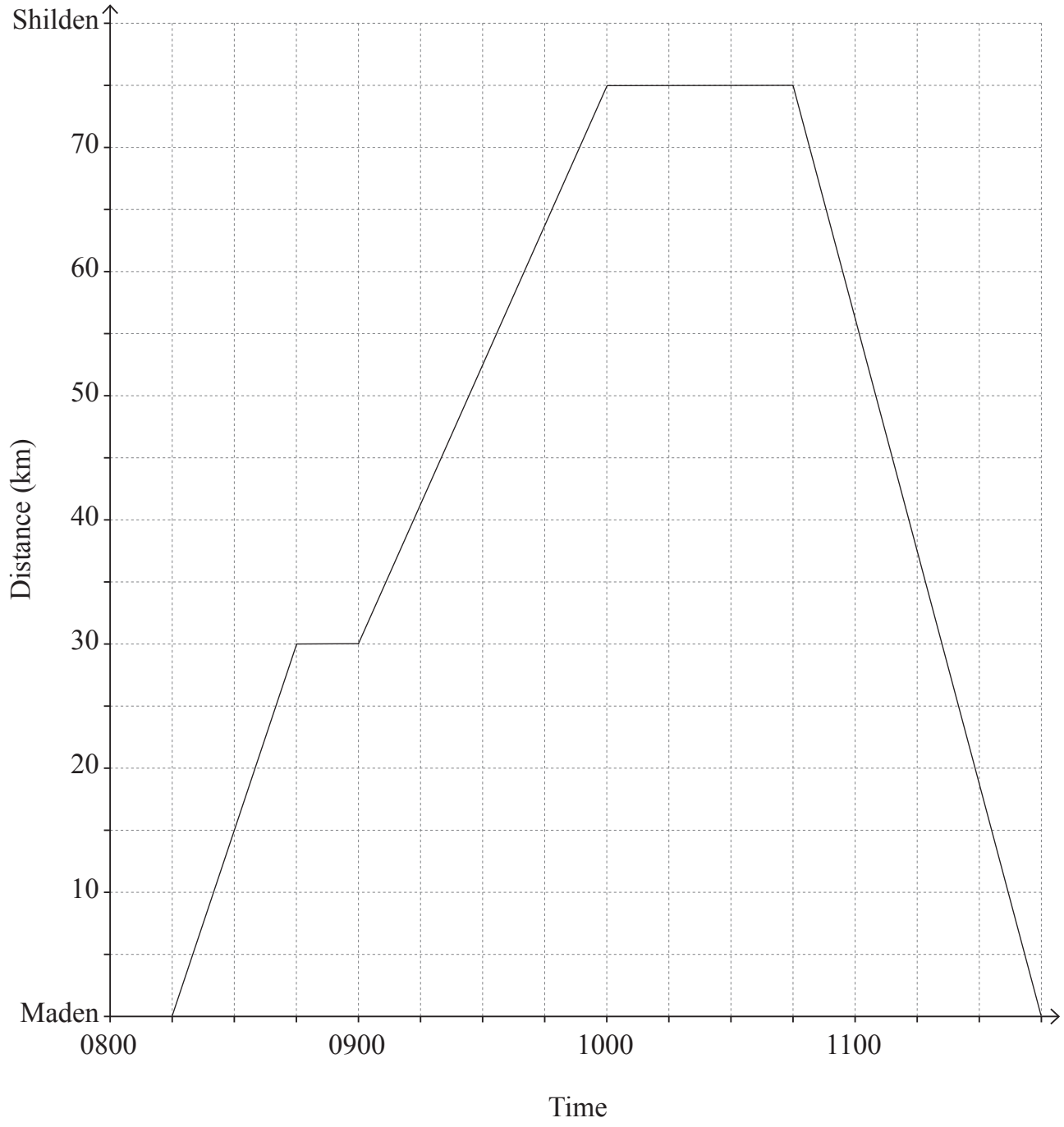
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(Questions continue overleaf)

[Turn over

11 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
15 + 45 = 60

Answer 60 minutes [1]

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

halfway between 30 and 75 km = 52.5

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

12 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

150 ml costs 5.40 ÷ 100 × 150 = £8.10

£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 150 ml is cheaper in Belfast

(check: 8.80 ÷ 1.07 = £8.22 > £8.10)

Answer *Belfast* [5]

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13 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?

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

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

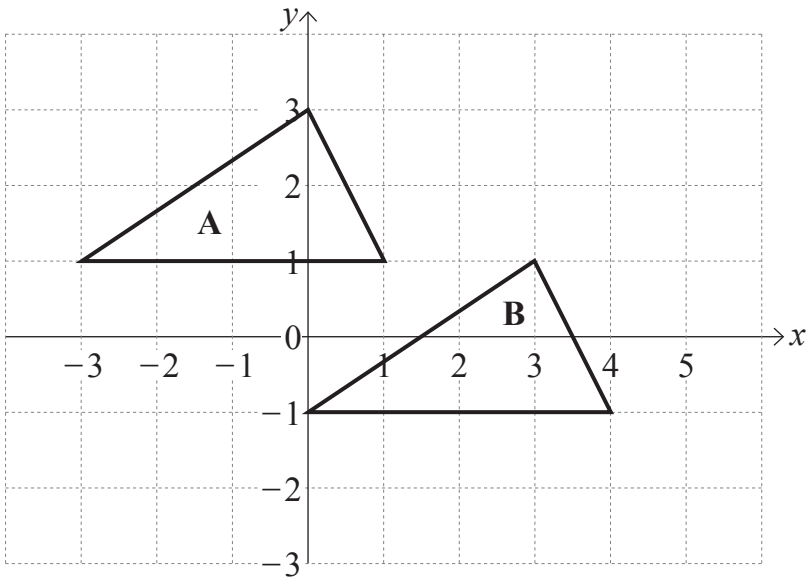
(b) What is the probability of credit or distinction?

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

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

[Turn over

14



Describe the **single** transformation which maps triangle **A** to triangle **B**.

Answer *Translation by the vector (3, −2); 3 right and 2 down* [2]

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For Examiner's use only	
Question Number	**Marks**
1	
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Total Marks	

Examiner Number

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