Rewarding Learning

Centre Number

Candidate Number

General Certificate of Secondary Education
January 2020

Mathematics

StemUp Model Solution

Unit M5 Paper 2
(With calculator)
Foundation Tier



[GMC52]

GMC52

WEDNESDAY 15 JANUARY, 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.

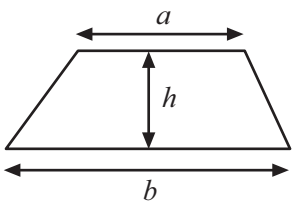
INFORMATION FOR CANDIDATES

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.

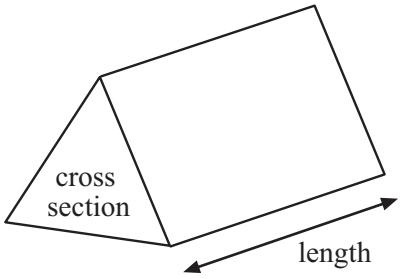
12510

Formula Sheet

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



Volume of prism = area of cross section × length



12510

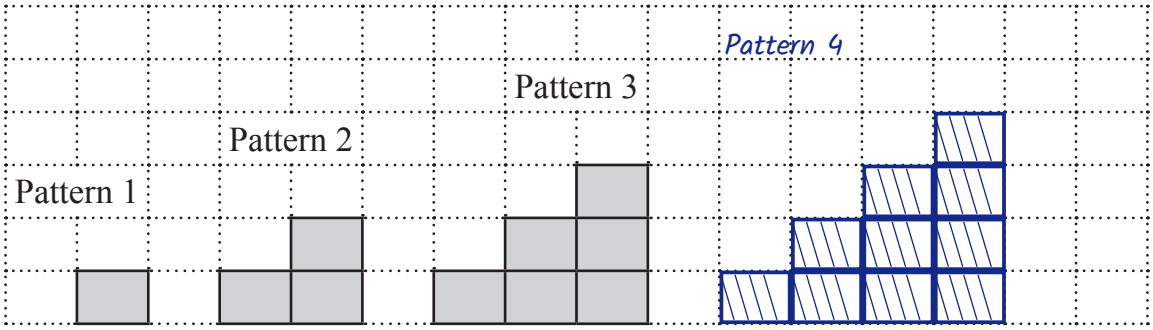
1 Part of a sequence of numbers is shown.

… 25, 36, 49, 64, 81, …

(a) What is the name of the sequence?

Answer Square numbers [1]

(b) Here is a pattern of bricks representing the first three triangular numbers.



(i) Draw pattern 4 on the grid above. [1]

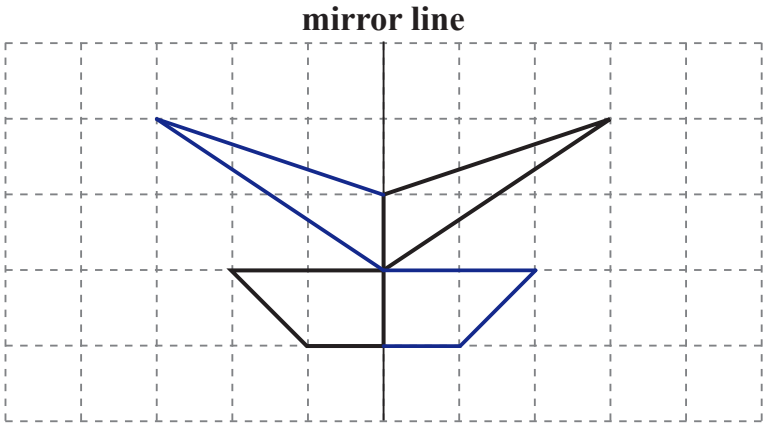
(ii) Complete the table for the number of bricks in the pattern.

Pattern 1	Pattern 2	Pattern 3	Pattern 4
1	3	6	10

[1]

[Turn over

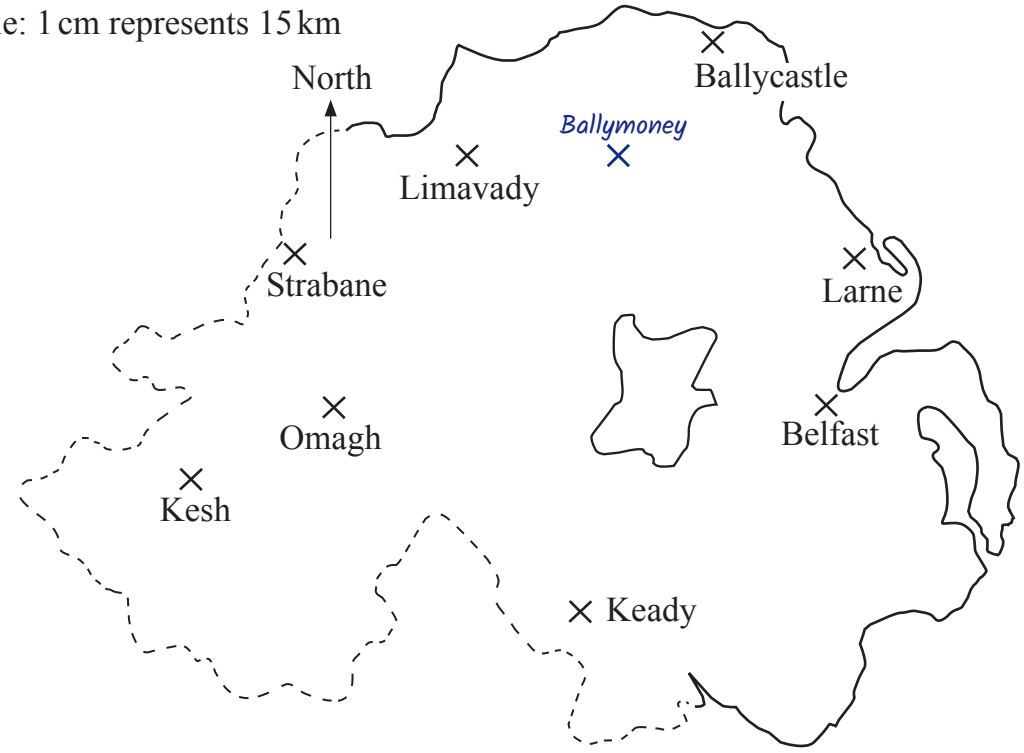
2 Reflect the shapes in the mirror line.



[2]

3 Some places in Northern Ireland are shown on the map.

Scale: 1 cm represents 15 km



(a) Which place shown on the map is furthest west?

Answer Kesh [1]

(b) Which place shown on the map is north east of Omagh?

Answer Ballycastle [1]

(c) A bird flies directly from Keady to Larne.
What is the actual distance the bird flies?

5.9 cm × 15 = 88.5

Answer 88.5 km [2]

(d) Ballymoney is 30 km due east of Limavady.
Mark Ballymoney on the map with an ×. [2]

[Turn over

4 Mel has some T-shirts.

8 are white, 5 are red, 2 are yellow and 1 is grey.

She takes one at random.

(a) Circle the chance that it is red.

impossible (unlikely) evens likely certain [1]

(b) Circle the chance that it is white.

impossible unlikely (evens) likely certain [1]

(c) Circle the chance that it is green.

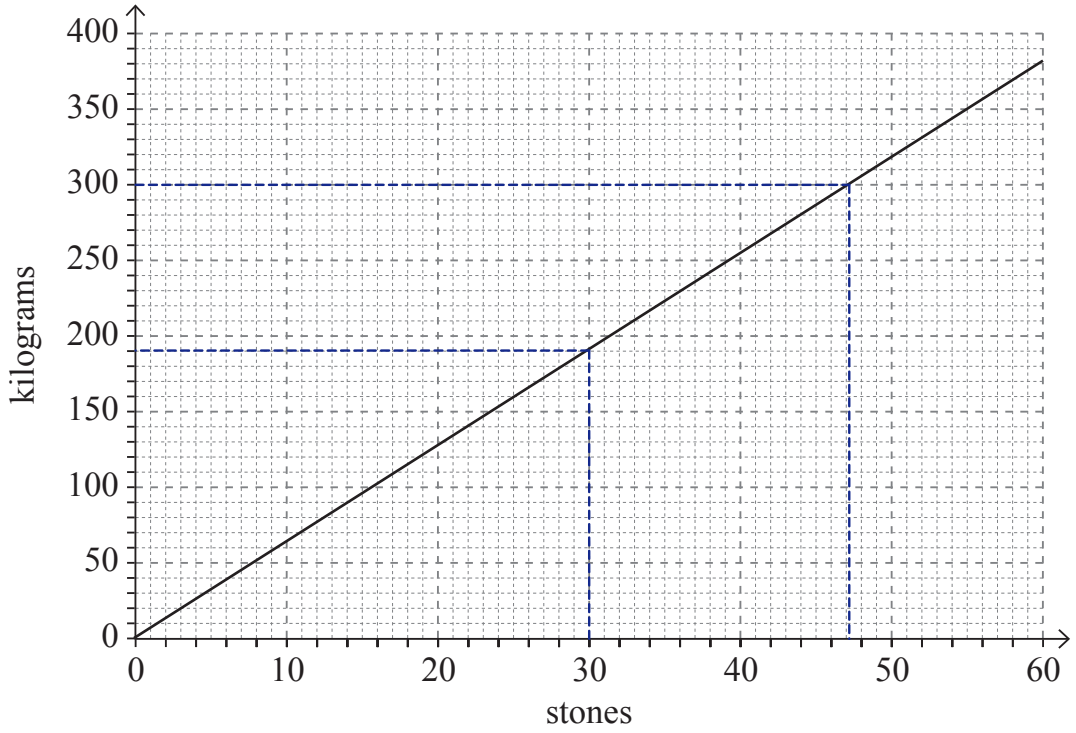
(impossible) unlikely evens likely certain [1]

5 Change 40 miles into kilometres.

5 miles = 8 km
40 ÷ 5 = 8
8 × 8 = 64

Answer 64 km [2]

6 You can use this graph to change between stones and kilograms.



(a) Use the graph to change 30 stones into kilograms.

Answer 190 kilograms [1]

(b) Nick orders 900 kilograms of topsoil.

Use the graph to change 900 kilograms into stones.

Show clearly how you used the graph.

300 kg = 47 stones (from graph)
900 = 3 × 300
3 × 47 = 141 stones

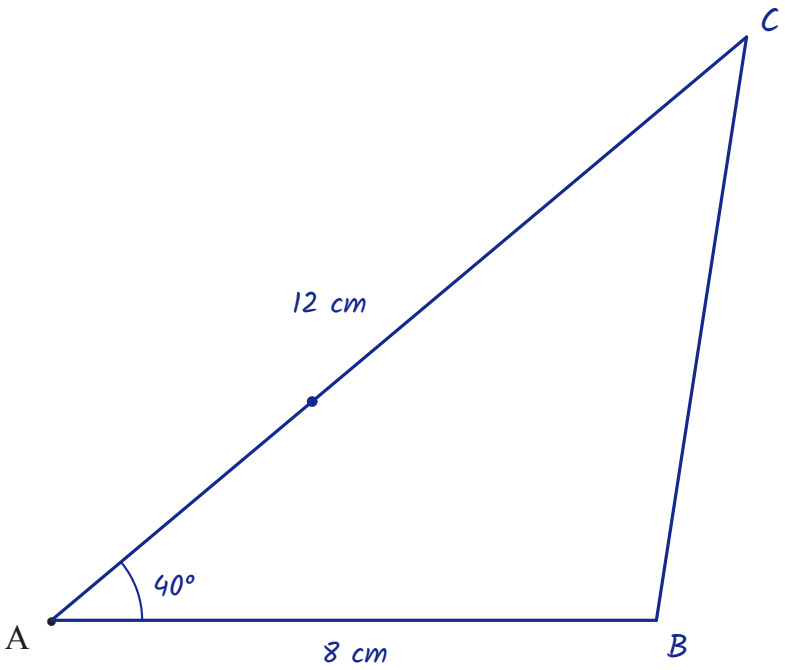
Answer 141 stones [2]

[Turn over

7 **(a)** Sarah read the following instructions to draw a triangle:

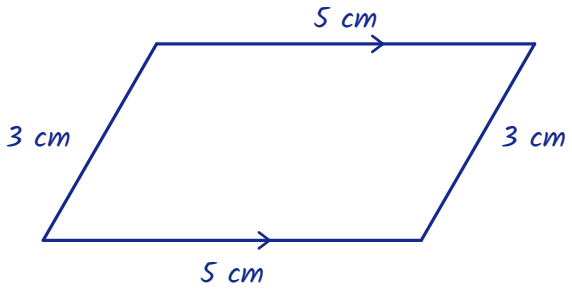
- Using a ruler, draw an 8 cm horizontal line from A.
- Label the other end B.
- Place a protractor at point A on the baseline AB and measure an angle of 40° Mark it with a dot.
- Draw a 12 cm line from A through your dot.
- Label the end of the line C.
- Join C to B.

Follow the instructions and draw Sarah's triangle below.



[3]

(b) Draw a parallelogram with sides of length 5 cm and 3 cm.

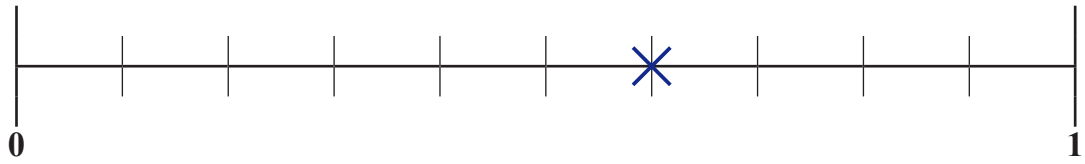


[2]

[Turn over

8 **(a)** The probability that it will rain tomorrow is 0.4

Mark with an X on the scale the probability that it will **not rain** tomorrow.



1 − 0.4 = 0.6

[1]

(b) A fair dice has the numbers 1, 2, 2, 4, 5 and 8 marked on its faces.

Explain clearly why the probability of getting a prime number is less than the probability of getting an even number.

Primes: 2, 2, 5 so P(prime) = $\frac{3}{6}$

Evens: 2, 2, 4, 8 so P(even) = $\frac{4}{6}$

$\frac{3}{6}$ is less than $\frac{4}{6}$ [3]

9 Alan wants to take his family on a 13-night trip to Florida.

He must pay for four adults and three children.

His children will be charged at half the adult price.

He had planned to go at Christmas but now will go in April.

How much extra will he have to pay?

Show all working.



© Getty Images

FLORIDA HOLIDAY PRICES

Departs	7th Sept to 15th Nov	16th Nov to 17th Jan	18th Jan to 13th Mar	14th Mar to 5th June	6th June to 30th June
13 nights	1699	1899	2049	2149	1899

Prices shown are for adults in £s per person.

Christmas (16th Nov to 17th Jan): adult £1899, child £949.50

4 × 1899 + 3 × 949.50 = 7596 + 2848.50 = £10 444.50

April (14th Mar to 5th June): adult £2149, child £1074.50

4 × 2149 + 3 × 1074.50 = 8596 + 3223.50 = £11 819.50

Extra = 11 819.50 − 10 444.50 = £1375

Answer £ 1375 [5]

[Turn over

10 Here are the first three terms of a number sequence.

90 84 78

(a) Write down the 8th term in this number sequence.

90, 84, 78, 72, 66, 60, 54, 48 (subtract 6 each time)

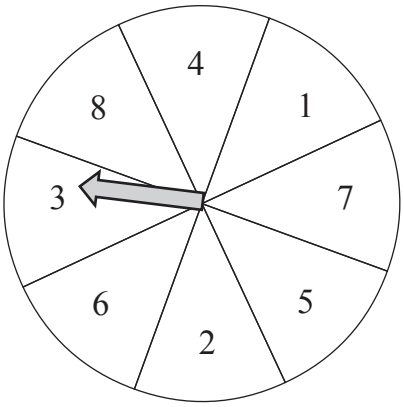
Answer 48 [1]

(b) Daniel says that 5 cannot be a term in this number sequence.

Is Daniel correct? Explain why.

Answer Yes, all the terms are even and 5 is odd [1]

11



A spinner consists of a circular wheel which is divided into eight sectors numbered 1 to 8 as in the diagram.

When spun, the arrow will point to one of the sectors.

(a) What is meant if the spinner is described as a **fair** spinner?

Answer *Each number has an equal chance of coming up,*

because every sector is the same size. [1]

(b) The spinner is **not** fair.

The probability of the arrow pointing to the sector numbered 7 is 0.15

Work out the probability of the arrow not pointing to the sector numbered 7

1 − 0.15 = 0.85

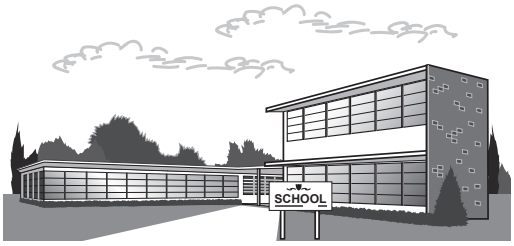
Answer *0.85* [2]

[Turn over

12 There are 648 pupils in a school.

The ratio of boys to girls is 4 : 5

How many girls are in the school?



4 + 5 = 9 parts
648 ÷ 9 = 72
72 × 5 = 360

Answer 360 [2]

13

Instructions for Fizzy Juice

Mix 3 parts Fruit Juice

with

7 parts Lemonade



Molly has 600 ml of fruit juice.

She also has 1800 ml of lemonade.

What is the maximum number of litres of fizzy juice she can make?

Fruit juice: 600 ÷ 3 = 200 ml per part

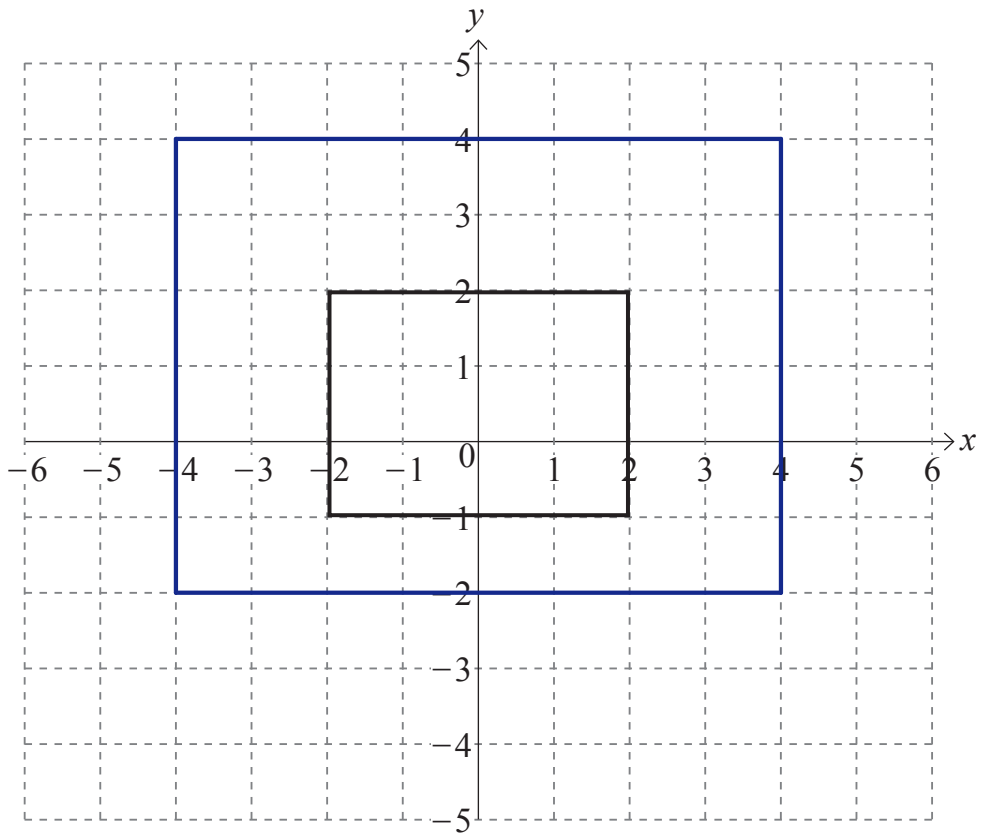
Lemonade needed: 7 × 200 = 1400 ml (she has 1800 ml)

600 + 1400 = 2000 ml = 2 litres

Answer *2* litres [3]

[Turn over

14



Enlarge the rectangle shown using a scale factor of 2 and centre of enlargement (0,0)

Corners (−2, −1), (2, −1), (2, 2), (−2, 2) × 2 →
(−4, −2), (4, −2), (4, 4), (−4, 4)

[3]

15 In America, Dave bought a book for 28 dollars.

The exchange rate was 1 dollar = 81p.

In France, Evie bought a book for 25 euro.

The exchange rate was £1 = 1.09 euro.

Who paid more and how much more?

Dave: 28 × 0.81 = £22.68

Evie: 25 ÷ 1.09 = 22.9357... = £22.94

22.94 − 22.68 = 0.26

Evie paid £0.26 = 26p more

Answer _____Evie_____ paid _____26p_____ more [4]

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

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