Rewarding Learning

Centre Number

Candidate Number

General Certificate of Secondary Education
2024

Mathematics

StemUp Model Solution

Unit M5 Paper 1
(Non-Calculator)
Foundation Tier



[GMC51]

GMC51

MONDAY 3 JUNE, 9.15am – 10.15am

TIME

1 hour.

INSTRUCTIONS TO CANDIDATES

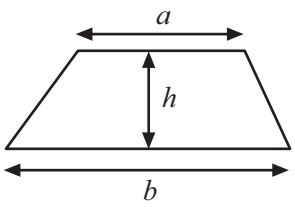
Write your Centre Number and Candidate Number in the spaces provided at the top of this page.
You must answer the questions in the spaces provided.
Do not write outside the boxed area on each page, on blank pages or tracing paper.
Complete in black ink only. **Do not write with a gel pen.**
Answer **all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

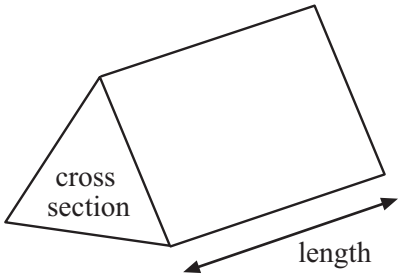
The total mark for this paper is 50.
Figures in brackets printed down the right-hand side of pages indicate the marks awarded to each question or part question.
You should have a ruler, compasses and a protractor.
The Formula Sheet is on page 2.

Formula Sheet

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

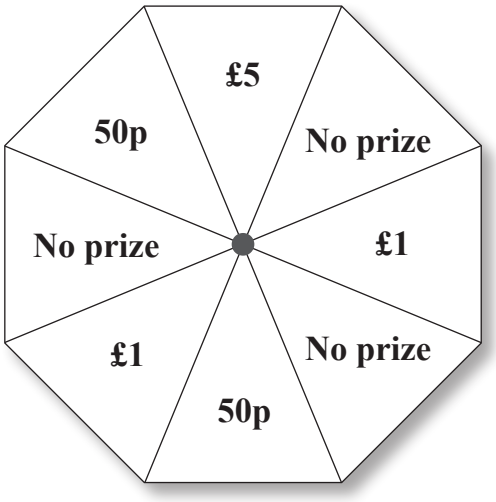


Volume of prism = area of cross section × length



14383

1 A fair 8-sided spinner is spun.



(a) Which outcome is least likely?

£5 is on only 1 section out of 8

Answer *£5* [1]

(b) Which outcomes have the same chance of happening?

Answer *50p* and *£1* [1]

(c) Which word best describes the chance of the spinner landing on "No prize"?

Circle your answer.

fifty-fifty likely (unlikely)

[1]

No prize: 3 out of 8, less than half

[Turn over

2



Source: © Getty Images

Dorothy gives sweets to each of her friends in the following order:

one to Aaron, one to Brenda, one to Cara and one to Dylan.

She then starts all over again until all the sweets are gone.

Dorothy has 27 sweets to give out.

Who gets the last sweet?

Show your working.

A B C D is one round of 4 sweets

27 ÷ 4 = 6 remainder 3

6 full rounds = 24 sweets

sweets 25, 26, 27 go to Aaron, Brenda, Cara

so the last sweet goes to Cara

Answer Cara [2]

3 Jamie has 6 ounces of butter.

He needs $\frac{1}{4}$ of a kilogram of butter for a recipe.

There are 36 ounces in a kilogram.

How many more ounces of butter does he need?

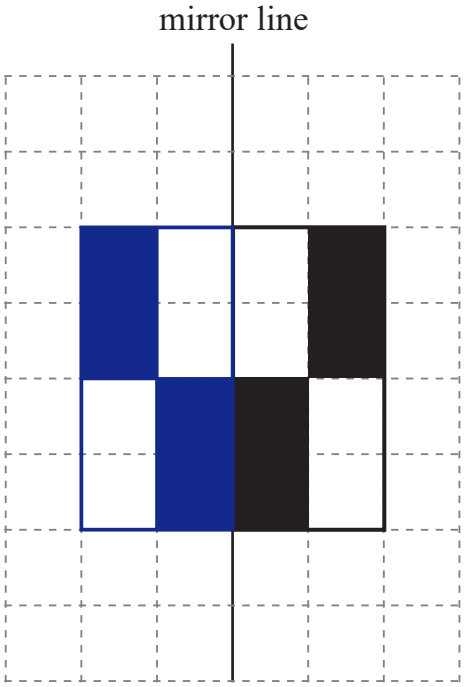
¼ of 36 = 36 ÷ 4 = 9 ounces needed

9 − 6 = 3

Answer 3 ounces [2]

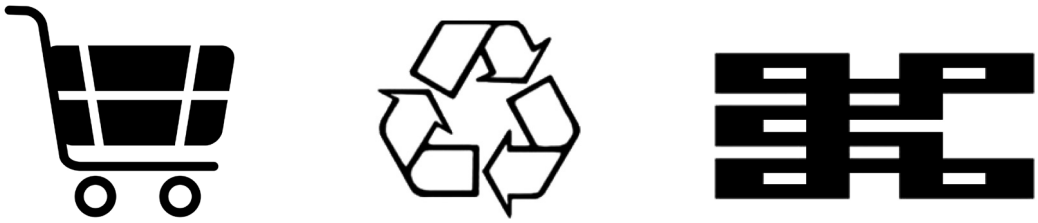
[Turn over

4 **(a)** Draw the reflection of the shape in the mirror line.



[2]

(b) How many of these shapes have line symmetry?



Circle the correct response.

None One Two Three

[1]

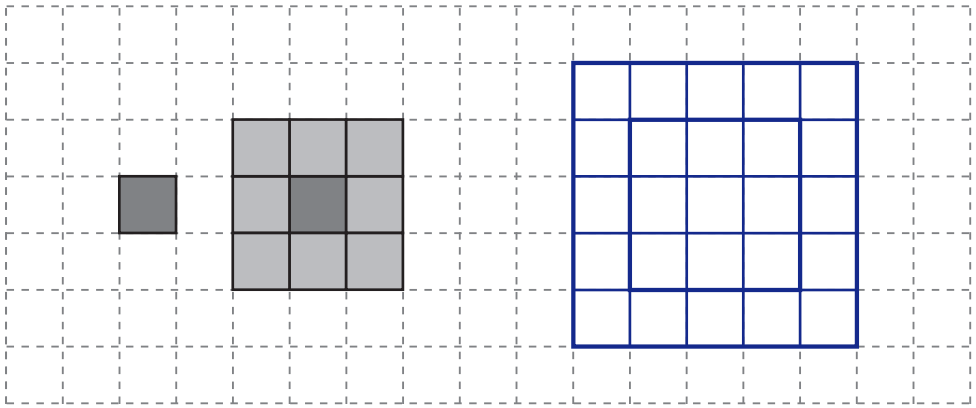
5 A pattern can be represented and built up using squares to completely surround the previous pattern.

Pattern 1 is 1 square.

Pattern 2 is Pattern 1 surrounded by **new** squares.

Pattern 3 is Pattern 2 surrounded by **new** squares.

(a) Draw Pattern 3



Pattern 1 Pattern 2 Pattern 3 [1]

(b) How many **new squares** are added to Pattern 2 to make Pattern 3?

Answer 16 squares [1]

5 × 5 = 25, 25 − 9 = 16

(c) How many **new squares** are added to Pattern 3 to make Pattern 4?

Answer 24 squares [1]

Pattern 4 is 7 × 7 = 49, 49 − 25 = 24

[Turn over

6 **(a)** Declan has some marbles.

Marie has 5 more than Declan.

Together they have 21 marbles.

How many marbles do they each have?

21 − 5 = 16

16 ÷ 2 = 8 Declan has 8

8 + 5 = 13 Marie has 13

check: 8 + 13 = 21

Answer Declan has 8 marbles

Marie has 13 marbles [2]

(b) Kirk is twice as old as Sharon.

The sum of their ages is 84

How old is Sharon?

Sharon = 1 part, Kirk = 2 parts, total 3 parts

84 ÷ 3 = 28

Answer 28 [2]

7 **(a)** **Estimate** the answer to

$$\frac{2.9 \times 30.1}{9.2}$$

Show your working clearly.

$\frac{2.9 \times 30.1}{9.2} \approx \frac{3 \times 30}{9} = \frac{90}{9} = 10$

Answer 10 [2]

(b) Jim wants to buy 2 adult tickets and 3 child tickets for a show.

An adult ticket costs £29.90

A child ticket costs £14.95

Jim has £100 to spend.

Use an **estimation method** to decide if Jim has enough money.

Show all your working.

£29.90 ≈ £30, £14.95 ≈ £15

2 × 30 = 60

3 × 15 = 45

60 + 45 = £105

£105 > £100, so Jim does not have enough money

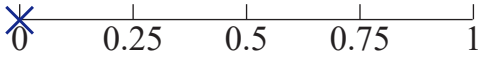
Does Jim have enough money? Answer No [2]

[Turn over

8 **(a)** A card is selected at random from a box of greetings cards.

The box contains only birthday cards, blank cards and congratulations cards.

(i) Mark on the scale, with an **X**, the probability of selecting a Christmas card.



[1]

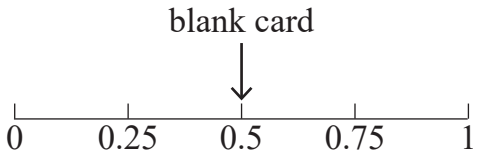
(ii) The probability of selecting a birthday card is 0.4

Explain why the statement below is incorrect.

"Over half the cards in the box are birthday cards"

Answer *0.4 is less than 0.5 (a half), so fewer than half of the cards are birthday cards.* [1]

(iii) The probability of selecting a blank card is shown.



Explain why there must be an **even** number of cards in the box.

Answer *P(blank) = 0.5, so exactly half the cards are blank. Half of an odd number is not a whole number, so total is even.* [1]

(b) A different box contains only postcards.

30 of the postcards say "Greetings from Portrush".



The probability of choosing a postcard at random from this box saying "Greetings from Portrush" is 0.5

How many postcards in total are in this box?

0.5 = ½, so 30 is half of the total

30 × 2 = 60

Answer 60 [1]

[Turn over

9 **(a)** What is the next number in the sequence?

5, 23, 41, 59, ...

+18 each time: 59 + 18 = 77

Answer 77 [1]

(b) A sequence starts with 8 and uses the rule add 15

8, 23, 38, 53, ...

Which one of the following is **not** true for the **6th term**?

A It is an odd number

B It is a prime number

C It is a multiple of 7

Answer C [2]

5th term = 53 + 15 = 68

6th term = 68 + 15 = 83

83 is odd, so A is true

83 is prime, so B is true

83 ÷ 7 = 11 r 6, not a multiple of 7, so C is not true

10 **(a)** Wayne has a playlist of 30 songs on his phone.

His favourite song is in this playlist.

What is the probability that a song chosen at random from the playlist is his favourite song?

Give your answer as a fraction.

1 favourite song out of 30

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

(b) Wayne deletes 5 songs from the playlist.

His favourite song is still in the playlist.

What is the probability now that a song chosen at random from the playlist is his favourite song?

Give your answer as a fraction.

30 − 5 = 25 songs left

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

[Turn over

11 6% of pupils at Marley Middle School are 6 feet tall or taller.

There are 700 pupils at the school.

How many pupils are **under** 6 feet tall?

1% of 700 = 700 ÷ 100 = 7

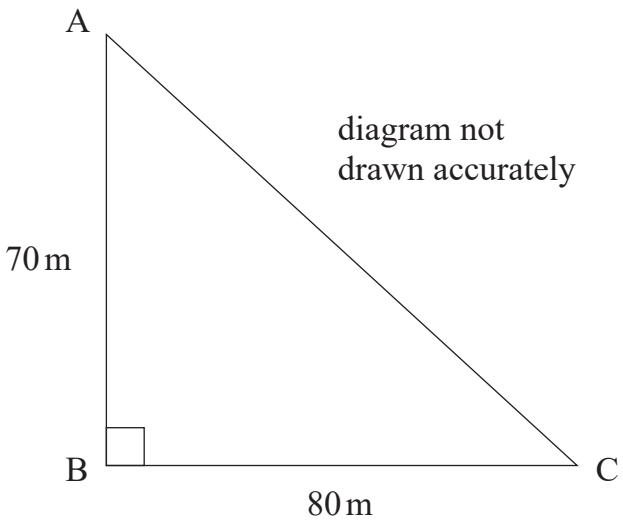
6% of 700 = 6 × 7 = 42 pupils 6 feet or taller

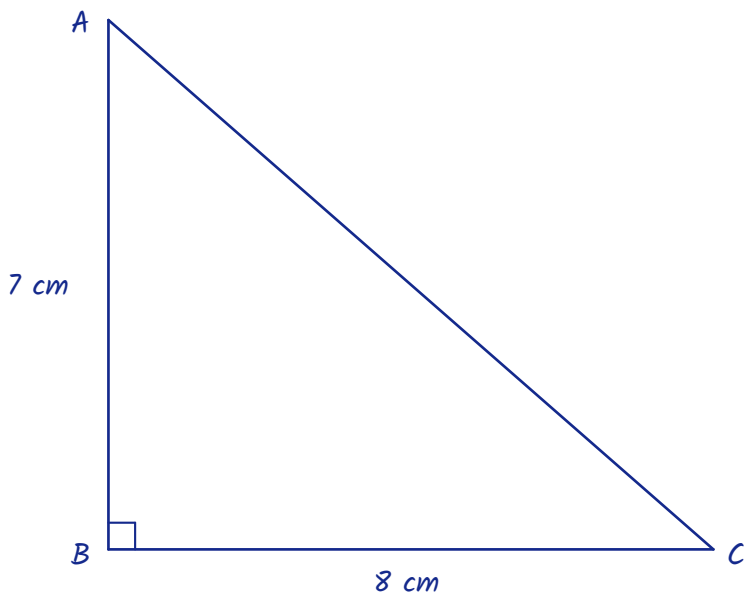
under 6 feet: 700 − 42 = 658

Answer 658 [3]

12 Draw a scale drawing to work out the actual length of the side AC of the triangle.

Use the scale 1 cm = 10 m





AB = 70 ÷ 10 = 7 cm

BC = 80 ÷ 10 = 8 cm

AC measures 10.6 cm

10.6 × 10 = 106 m

Answer 106 m [3]

[Turn over

13 A fair spinner has three equal sections labelled A, B and 4

It is spun twice.

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

	A	**B**	**4**
A	(A, A)	(A, B)	(A, 4)
B	(B, A)	(B, B)	(B, 4)
4	(4, A)	(4, B)	(4, 4)

[2]

(b) What is the probability of getting (4, 4)?

(4, 4) is 1 outcome out of 9

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

14 **(a)** Jeff earns £72 for 4 hours of tutoring.

How much does he earn for 10 hours of tutoring?

£72 ÷ 4 = £18 per hour

18 × 10 = 180

Answer £ 180 [2]

(b) A shop uses the following ingredients to make an ice cream sundae.

Ice cream	3 scoops
Sprinkles	4 spoonfuls
Whipped cream	2 tablespoons

How many scoops of ice cream were used on a day when they used 24 spoonfuls of sprinkles to make sundaes?

24 ÷ 4 = 6 sundaes

6 × 3 = 18 scoops

Answer 18 [2]

[Turn over

15 A café owner works out the probability of customers buying a drink with their meal.

Drink	Water	Milk	Hot drink	Other	None
Probability	0.24		0.3	0.15	0.12

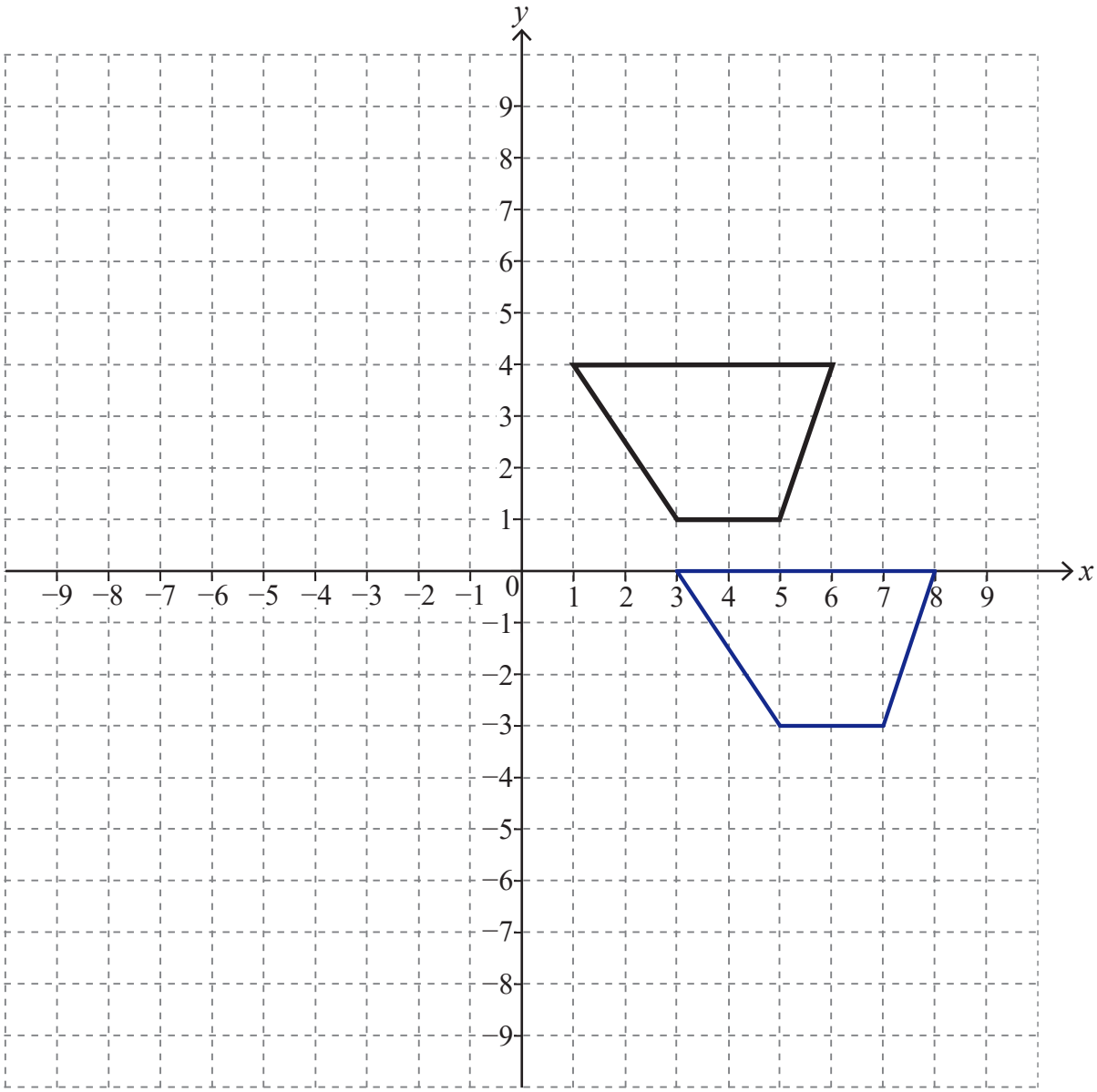
What is the probability that a customer, chosen at random, buys milk?

$0.24 + 0.3 + 0.15 + 0.12 = 0.81$

$1 - 0.81 = 0.19$

Answer 0.19 [2]

16 Translate the shape 2 to the right and 4 down.



[2]

[Turn over

17 In a box there are bronze, silver and gold medals.

There are 21 bronze and 42 silver medals.

A medal is taken at random from the box.

The probability of taking a gold medal is $\frac{3}{10}$

How many gold medals are there?

$1 - \frac{3}{10} = \frac{7}{10}$ *bronze and silver*

$21 + 42 = 63$

63 *is* $\frac{7}{10}$ *of the total,* $63 \div 7 = 9 = \frac{1}{10}$

total $= 9 \times 10 = 90$

gold $= 90 - 63 = 27$ *(or* $9 \times 3 = 27$*)*

Answer 27 [3]

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