Rewarding Learning

Centre Number

Candidate Number

General Certificate of Secondary Education
2022

Mathematics

StemUp Model Solution

Unit M6 Paper 2
(With calculator)
Foundation Tier



[GMC62]

GMC62

MONDAY 13 JUNE, 10.45am–11.45am

TIME

1 hour.

INSTRUCTIONS TO CANDIDATES

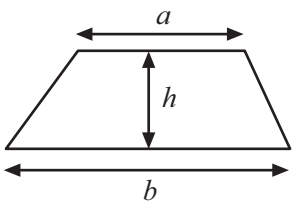
Write your Centre Number and Candidate Number in the spaces provided at the top of this page. **You are provided with Foundation Tier Additional Support Materials for use with this paper.**
You must answer the questions in the spaces provided.
Do not write outside the boxed area on each page, on blank 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

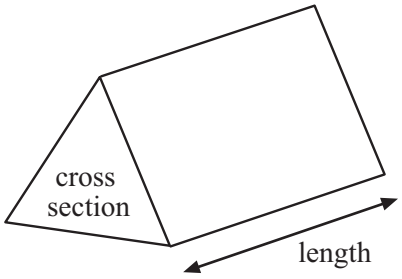
The total mark for this paper is 50.
Figures in brackets printed down the right-hand side of pages indicate the marks awarded to each question or part question.
You should have a calculator, ruler, compasses and a protractor.
The Formula Sheet is on page 2.

Formula Sheet

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

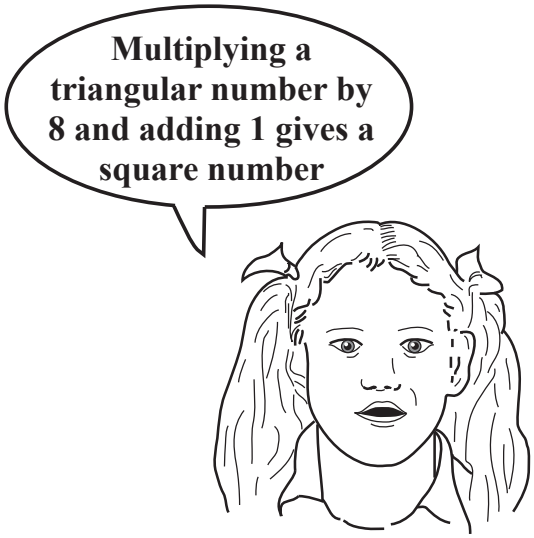


Volume of prism = area of cross section × length



1 **(a)** Fifteen is a triangular number.

Martha says



Show that Martha is correct for this triangular number.

$15 \times 8 = 120$

$120 + 1 = 121$

$121 = 11 \times 11 = 11^2$, which is a square number ✓

[2]

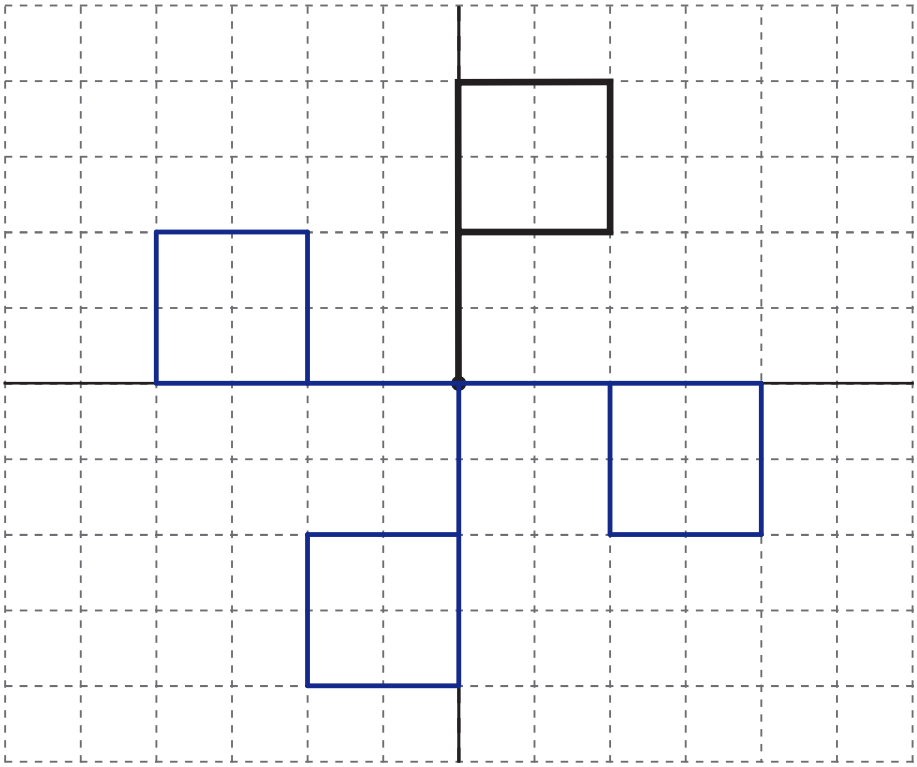
(b) Write down the triangular number between 40 and 50

1, 3, 6, 10, 15, 21, 28, 36, 45, 55

Answer 45 [1]

[Turn over

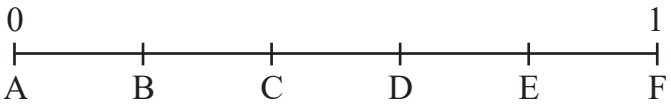
2 Complete the shape so that it has rotational symmetry of order 4



[2]

3 There are 2 ham sandwiches, 3 chicken sandwiches, 4 cheese sandwiches and 1 egg sandwich on a plate.

Benny takes a sandwich at random from the plate.



Which point (A, B, C, D, E or F) on the probability scale best matches the probability of Benny taking

(a) a prawn sandwich, Answer A [1]

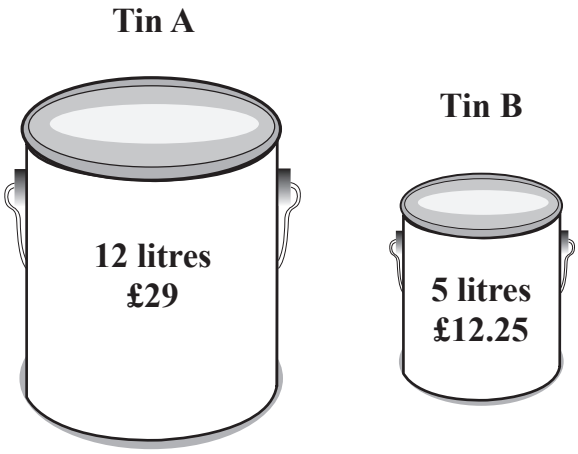
no prawn sandwiches, so P(prawn) = 0

(b) a cheese sandwich? Answer C [1]

P(cheese) = 4 ÷ 10 = 0.4, which is point C

[Turn over

4 Paint is sold in two sizes of tins.



(a) Which size of tin is better value?

Show your working.

Tin A: 29 ÷ 12 = 2.4166... = £2.42 per litre
Tin B: 12.25 ÷ 5 = £2.45 per litre
£2.42 < £2.45, so Tin A is better value

Answer Tin A [3]

(b) Why might a customer choose not to buy the size that is best value for money?

Answer They may not need more than 5 litres of paint [1]

(c) A painter is paid £84 for 6 hours' work.

How much would he be paid for 9 hours' work?

84 ÷ 6 = £14 per hour
14 × 9 = 126

Answer £ 126 [1]

5 Tallia goes pony riding.



She has been told that the pony she will ride is any age from 2 to 15 years old, inclusive.

There is only one pony of each age.

Tallia picks a pony at random.

What is the probability that the pony's age is less than 5?

Ages less than 5: 2, 3, 4 (3 ponies)
Ages 2 to 15 inclusive: 14 ponies

Answer $\frac{3}{14}$ [2]

[Turn over

6 **(a)** Winter 2018–19 was the wettest on record in the United States.



The average rainfall was 9.01 inches.

How many centimetres was this to the nearest centimetre?

1 inch = 2.54 cm

9.01 × 2.54 = 22.8854 cm
= 23 cm (nearest cm)

Answer 23 cm [3]

(b) A bag of potatoes weighs 5 kg.

How many pounds is this?

1 kg = 2.2 pounds
5 × 2.2 = 11

Answer 11 pounds [2]

7 Kendra flips a coin and rolls a dice.

(a) List all the possible outcomes in the table below.

Two have already been filled in for you.

Dice

Coin		**1**	**2**	**3**	**4**	**5**	**6**
	Heads (H)	H1	H2	H3	H4	H5	H6
	Tails (T)	T1	T2	T3	T4	T5	T6

[2]

Given that each outcome is equally likely, find the probability that

(b) Kendra gets a 5,

H5, T5: 2 out of 12 outcomes

Answer $\frac{2}{12}$ [1]

(c) Kendra gets a Tail and an odd number.

T1, T3, T5: 3 out of 12 outcomes

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

8 **(a)** Describe, in words, the rule for continuing the sequence

71, 66, 61, 56, 51 …

Answer Subtract 5 each time [1]

(b) Write down the next two terms in the sequence below.

1, 8, 27, 64, 125, 216 [2]

Cube numbers: 1^3, 2^3, 3^3, 4^3, so next are $5^3 = 125$ and $6^3 = 216$

[Turn over

9 A concrete mixture contains cement, sand and gravel in the ratio 1 : 2 : 3

(a) What weight of concrete contains 36 kg of gravel?

gravel: 3 parts = 36 kg, so 1 part = 12 kg
12 + 24 + 36 = 72

Answer 72 kg [2]

(b) Work out the weight of sand contained in 198 kg of concrete.

1 + 2 + 3 = 6 parts
198 ÷ 6 = 33 kg per part
sand = 33 × 2 = 66

Answer 66 kg [2]

10 Phil changed 230 euro into £ and Gerry changed 168 euro into £.

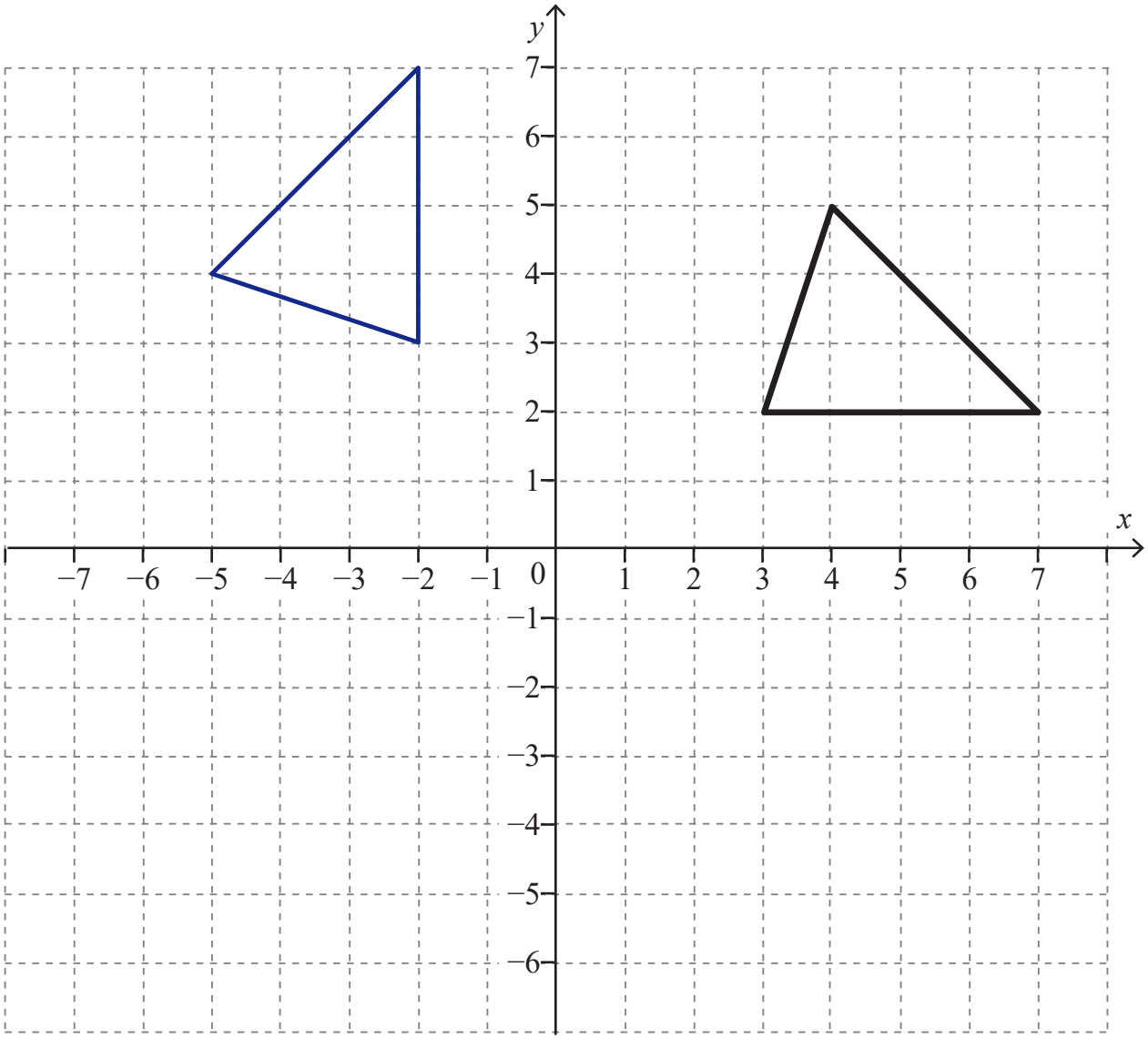
The exchange rate is £1 = 1.09 euro.

How much more did Phil receive in £?

230 − 168 = 62 euro more
62 ÷ 1.09 = 56.880733...
= £56.88

Answer £ 56.88 [3]

11 Rotate the triangle 90° anticlockwise about the origin (0, 0)



[3]

[Turn over

12 Marie has a recipe for Spaghetti Carbonara which requires the following ingredients.

Spaghetti	500 g
Bacon	200 g
Eggs	8
Cream	76 ml
Parmesan	48 g

Marie only has 150 g of bacon.

Work out how much of the other ingredients she should use.

150 ÷ 200 = 0.75
Spaghetti: 500 × 0.75 = 375 g
Eggs: 8 × 0.75 = 6
Cream: 76 × 0.75 = 57 ml
Parmesan: 48 × 0.75 = 36 g

Answer

Spaghetti	375 g
Eggs	6
Cream	57 ml
Parmesan	36 g

[3]

stemup.co.uk

13 Calculate the size of the angle a.

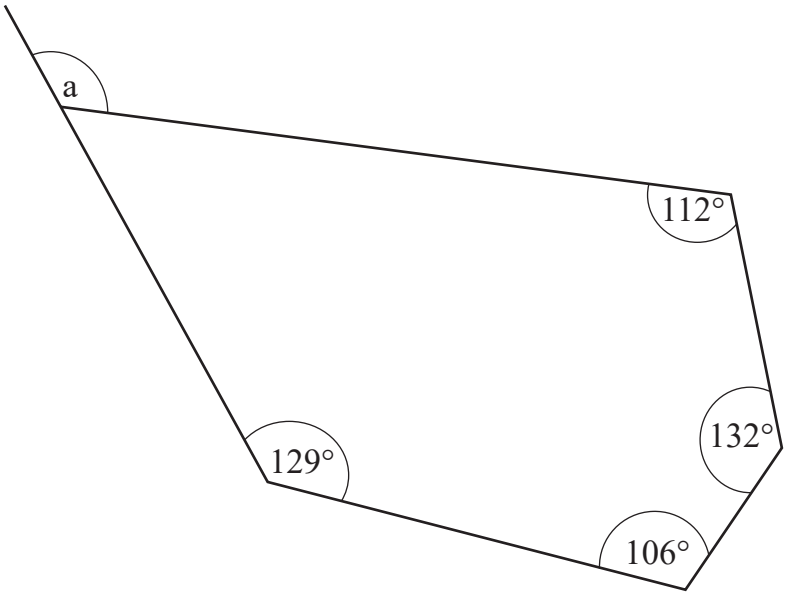


diagram not drawn accurately

Sum of interior angles = (5 − 2) × 180 = 540°
112 + 132 + 106 + 129 = 479°
Interior angle = 540 − 479 = 61°
a = 180 − 61 = 119° (angles on a straight line)

Answer Angle a = *119* ° [3]

[Turn over

14 The equation $x^3 - 3x = 34$ has a solution between 1 and 5

Use a trial and improvement method to find this solution.

Give your answer correct to one decimal place.

You must show ALL your working.

x	$x^3 - 3x$	
3	18	Too small
4	52	Too big
3.5	32.375	Too small
3.6	35.856	Too big
3.55	34.088875	Too big

3.55 is too big, so x is between 3.5 and 3.55

Answer x = 3.5 [4]

15 **(a)** When a spinner was spun 50 times, it landed on red 12 times.
When spun another 50 times, it landed on red another 9 times.

Calculate the relative frequency for red

(i) after the first 50 spins,

Answer $\frac{12}{50}$ [1]

(ii) after the 100 spins.

12 + 9 = 21 reds out of 100

Answer $\frac{21}{100}$ [1]

(b) The spinner landed on yellow 40 times in the 100 spins.

(i) Estimate the probability for this spinner landing on yellow.

Answer $\frac{40}{100}$ [1]

(ii) Estimate how many times the spinner will land on yellow in 300 spins.

Answer 120 [1]

40 ÷ 100 × 300 = 120

THIS IS THE END OF THE QUESTION PAPER

Sources: All images © CCEA

DO NOT WRITE ON THIS PAGE

For Examiner's use only	
Question Number	**Marks**
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	
Total Marks	

Examiner Number

Permission to reproduce all copyright material has been applied for.
In some cases, efforts to contact copyright holders may have been unsuccessful and CCEA will be happy to rectify any omissions of acknowledgement in future if notified.

Rewarding Learning

General Certificate of Secondary Education
Summer 2022

GCSE Mathematics

FOUNDATION TIER
ADDITIONAL SUPPORT MATERIALS
(For use in Summer 2022)

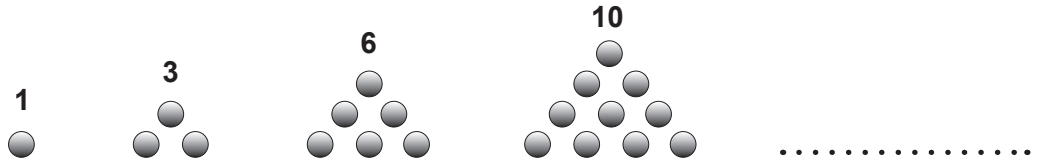
stemup.co.uk

FOUNDATION TIER ADDITIONAL SUPPORT MATERIALS (Summer 2022)

Numbers

Lowest common multiple (LCM): The lowest common multiple is the lowest multiple shared by 2 or more numbers.

Triangular numbers – are a pattern of numbers which form triangles. Each number in the sequence adds a new row of dots to the triangle.



Trial and Improvement

This is a method of trying different values in an equation until you get a suitable solution (e.g to 1 decimal place).

Measures

Conversion from metric to imperial units

1 kg = 2.2 pounds (lb)

Metric units

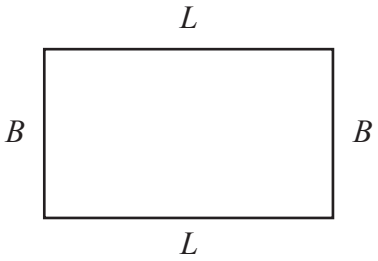
1 ml = 1 cm^3

Compound Measures

$$\text{Density} = \frac{\text{Mass}}{\text{Volume}}$$

$$\text{Average Speed} = \frac{\text{Distance}}{\text{Time}}$$

Perimeter and Volume



The perimeter of a rectangle is the distance around the outside of the rectangle. It is found by adding the lengths of the 4 sides of the rectangle.

$P = 2L + 2B$ where P is perimeter, L is length and B is breadth.

The volume of a cuboid is found by multiplying the length by the breadth by the height of the cuboid.

$V = L \times B \times H$ where V is volume, L is length, B is breadth and H is height.

The circumference (perimeter) of a circle is $C = 2\pi r$ where r is the radius of the circle. An alternative formula is $C = \pi d$ where d is the diameter of the circle.

Geometry and Angles

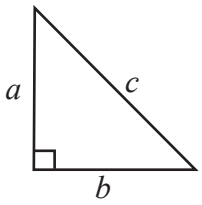
There are 180° on a straight line.
There are 180° inside a triangle.
An isosceles triangle is a triangle with 2 equal sides and 2 equal angles.
The sum of all the angles inside a polygon is given by $180(n - 2)$ where n is the number of sides in the polygon.

stemup.co.uk

Pythagoras' Theorem

If *a, b* and *c* are the sides of a right angled triangle shown below, then

$$a^2 + b^2 = c^2$$



Range

The range of a set of data is the difference between the largest value and the smallest value in the data set.

Mean

The mean of a set of data is the sum of all the data values divided by the number of data values.

Estimate for the mean of a grouped frequency distribution

Estimated mean = sum of (mid interval values multiplied by their frequency) divided by the sum of all the frequencies.

Pie Chart

In a pie chart, the total angle that corresponds to the entire data set is 360°

Probability

The sum of the probabilities of all outcomes equals 1

stemup.co.uk