Rewarding Learning

Centre Number

Candidate Number

General Certificate of Secondary Education
November 2021

Mathematics

StemUp Model Solution

Unit M6 Paper 2
(With calculator)
Foundation Tier



[GMC62]

GMC62

THURSDAY 2 DECEMBER, 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 sixteen** 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.

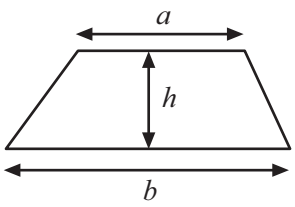
INFORMATION FOR CANDIDATES

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.

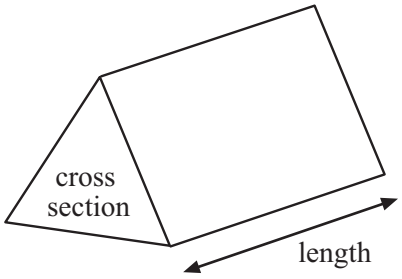
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Formula Sheet

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

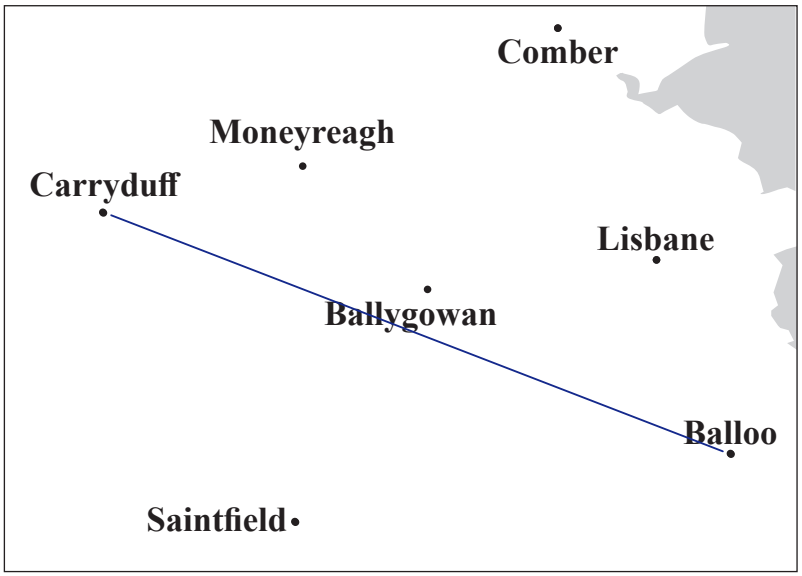


Volume of prism = area of cross section × length



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1 The map shows some places in Co Down.



Scale: 1 cm represents 1 mile

A bird flies direct from Carryduff to Balloo.

What is the actual distance the bird flies?

Distance on map = 8.9 cm
8.9 × 1 = 8.9 miles

Answer 8.9 miles [2]

[Turn over

2 **(a)** Gordon has 185 grams of flour.

He needs half a pound of flour for a recipe.

There are 454 grams in one pound.

How much **more** flour does he need?

Half a pound = 454 ÷ 2 = 227 g
227 – 185 = 42 g

Answer 42 g [2]

(b) Glenarm is 20 miles from Carrickfergus.

How many kilometres is this?

5 miles = 8 km
20 ÷ 5 × 8 = 32 km

Answer 32 km [2]

3 Cathy is working on a sequence:

4, 9, 14, 19, ____

She continues this sequence for a few more terms and spots a pattern.

She uses the pattern to predict correctly what the **last digit** is in the 30th term.

What is the last digit?

4, 9, 14, 19, 24, 29, 34, 39, ...
Odd terms end in 4, even terms end in 9
30th term = 5 × 30 − 1 = 149, which ends in 9

Answer 9 [1]

[Turn over

4 Some children are in a playground.

They are aged 10, 8, 11, 8, 9, 8 and 8 years old.

One of the children is chosen at random.

(a) What is the probability that the child is 8 years old?

Answer $\frac{4}{7}$ [1]

(b) What is the probability that the child is 7 years old?

Answer 0 [1]

(c) What is the probability that the child is not 11 years old?

Answer $\frac{6}{7}$ [1]

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5 **(a)** The probability that Matt eats breakfast is marked on the scale with a B.

What is the probability?



Answer 0.8 [1]

(b) Matt has a three-digit combination lock for his bike.



He has forgotten the code.

He knows the first digit is 2

The second digit is either 3 or 4

The third digit is 5, 6 or 7

List all the possible combinations of Matt's code.

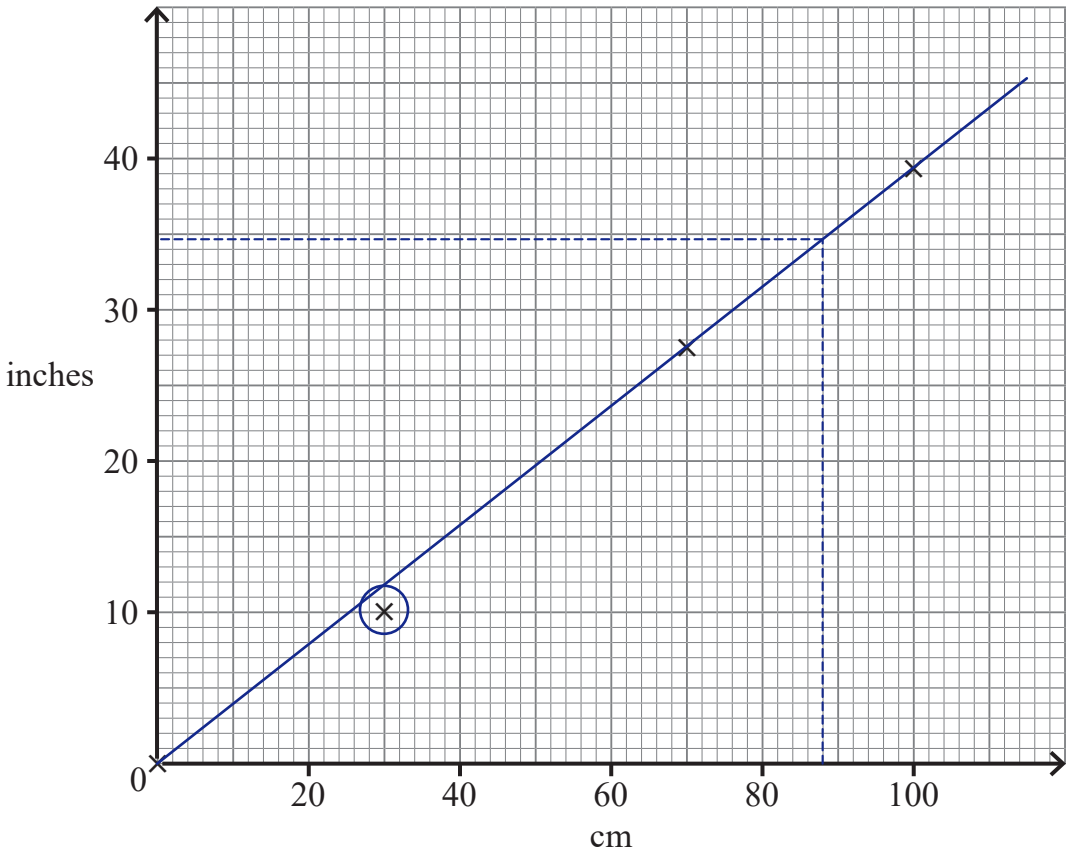
235 236 237

245 246 247

[2]

[Turn over

6 Pat plotted four points to make a conversion graph from centimetres to inches.



(a) One point is wrong. Circle the wrong point. [1]

(b) Draw the conversion graph. [1]

(c) Use the graph to convert 88 cm to inches.

Answer 35 inches [1]

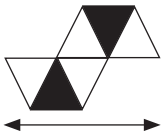
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7 A trapezium is divided into 3 equilateral triangles, 1 black and 2 white.

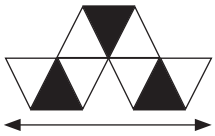
The trapezium has a side length of 20 cm as shown.



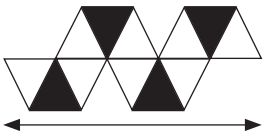
The trapeziums are lined up to make chain patterns.



Pattern 1



Pattern 2



Pattern 3

(a) Complete the table for the missing length for 10 trapeziums.

Number of trapeziums	1	2	3	4	.....	10
Length of chain (cm)	20	30	40	50	.....	110

Each extra trapezium adds 10 cm
10 × 10 + 10 = 110 cm

[2]

(b) Complete the table for the missing number of **white triangles** when the pattern number is 10

Pattern number	1	2	3	.....	10
Number of white triangles	4	6	8	.....	22

Each pattern adds 2 white triangles: 2 × 10 + 2 = 22

[1]

[Turn over

8



Raisins are sold in three different sizes of tubs.

Which is the best value for money?

You must show your working.

Cost of 100 g:

500 g: £3.50 ÷ 5 = 70p

200 g: £1.50 ÷ 2 = 75p

900 g: £6.50 ÷ 9 = 72.22...p

70p is the cheapest per 100 g

Answer 500 g tub (£3.50) [4]

9 Bob changed £35 into euro.

Bev changed £42 into euro.

The exchange rate was £1 = 1.06 euro.

How many more euro did Bev get than Bob?

Bob: 35 × 1.06 = 37.10 euro

Bev: 42 × 1.06 = 44.52 euro

44.52 − 37.10 = 7.42 euro

Answer 7.42 euro [3]

[Turn over

10 **(a)** A roll of wallpaper has a width of 53 cm, measured to the nearest centimetre.

What is the maximum width of this roll of wallpaper?

Answer 53.5 cm [1]

(b) A television has a screen width of 88.6 cm, measured to one decimal place.

What is the minimum screen width of this television?

Answer 88.55 cm [1]

11 One Saturday, 460 people visited the museum.

180 were children of which $\frac{3}{5}$ were girls.

280 were adults and the ratio of men to women was 4:3

Paul says that, altogether, more males than females visited the museum that Saturday.

Is he correct?

Show all your working.

Children: $180 \div 5 = 36$

Girls $= 3 \times 36 = 108$, Boys $= 180 - 108 = 72$

Adults: $280 \div 7 = 40$

Men $= 4 \times 40 = 160$, Women $= 3 \times 40 = 120$

Males $= 72 + 160 = 232$

Females $= 108 + 120 = 228$

$232 > 228$, so more males than females.

Yes, Paul is correct.

Answer Yes [4]

[Turn over



12

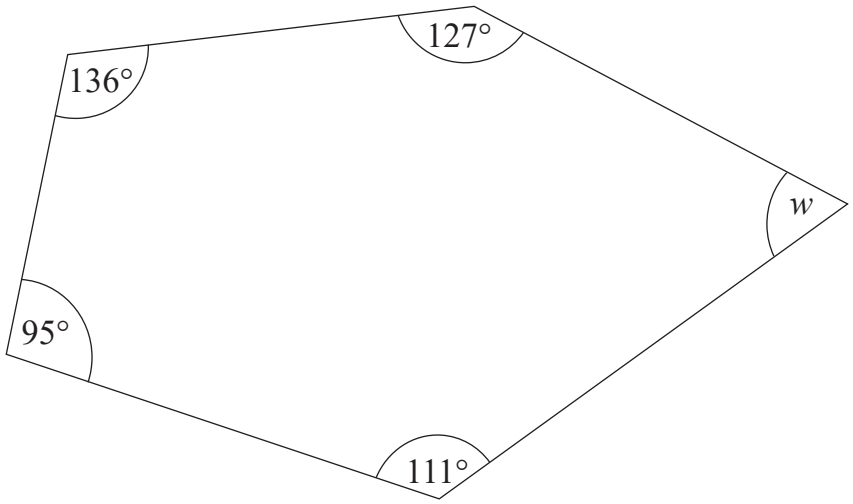


diagram not drawn accurately

Work out the size of the angle w in the pentagon drawn above.

Sum of angles in a pentagon = (5 − 2) × 180 = 540°

127 + 136 + 95 + 111 = 469°

w = 540 − 469 = 71°

Answer w = 71 ° [3]

13 A company makes memory chips.

The probability that one of these memory chips is faulty is 0.025

The company makes 1800 memory chips each hour.

Work out an estimate for the number of memory chips made per hour that will **not** be faulty.

P(not faulty) = 1 − 0.025 = 0.975

1800 × 0.975 = 1755

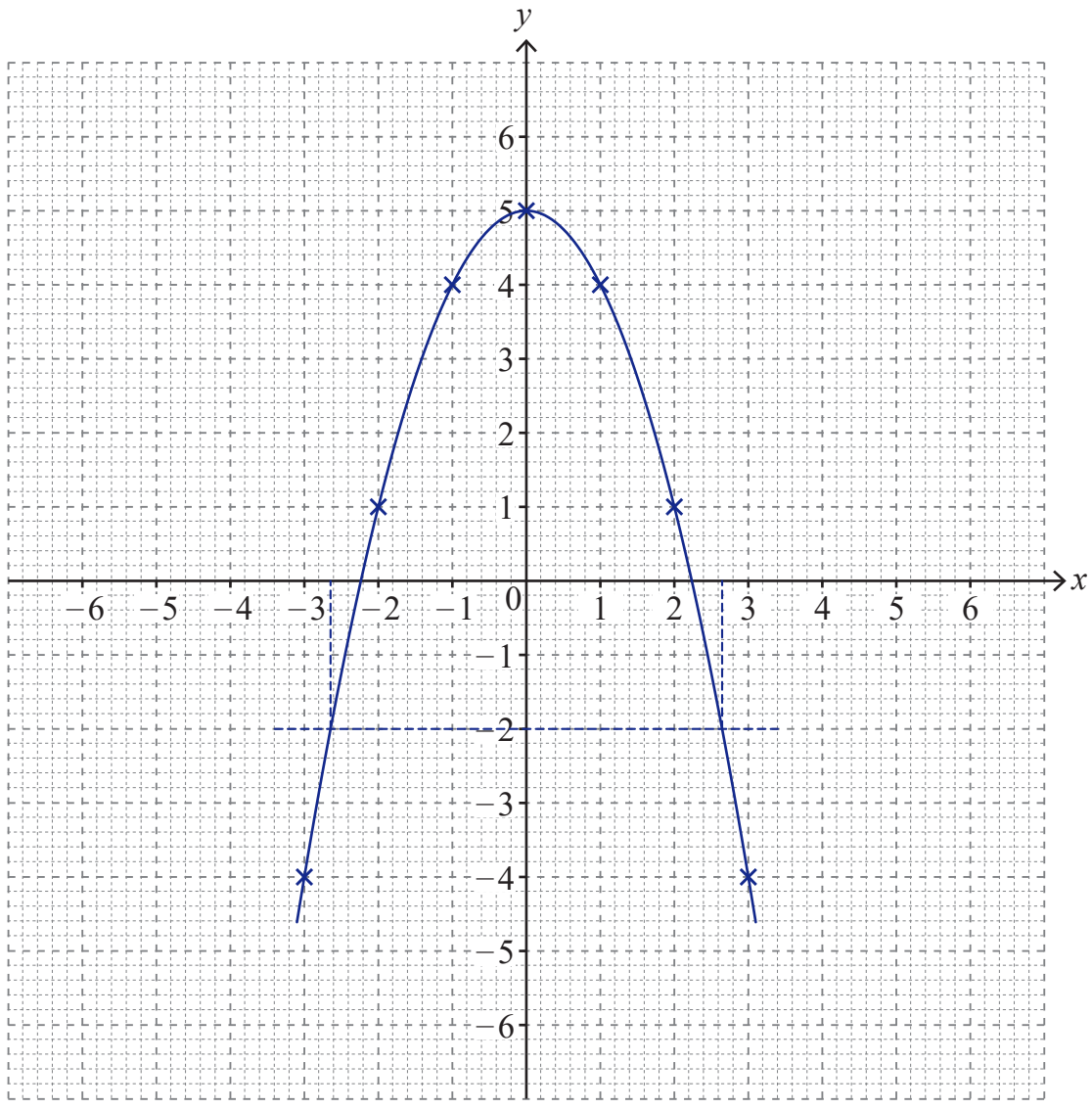
Answer 1755 [3]

[Turn over

14 (a) Draw the graph of $y = 5 - x^2$

Use the table below to help you.

x	–3	–2	–1	0	1	2	3
y	–4	1	4	5	4	1	–4



[3]

(b) Use the graph of $y = 5 - x^2$ to solve the equation $5 - x^2 = -2$

Read where the curve crosses $y = -2$

Answer $x =$ -2.6 or $x =$ 2.6 [1]

15 **(a)** Simplify

(i) $12x^5 \div 3x^3$

$12 \div 3 = 4$, $x^5 \div x^3 = x^{5-3} = x^2$

Answer $4x^2$ [2]

(ii) $(x^3)^4$

$x^{3 \times 4} = x^{12}$

Answer x^{12} [1]

(b) Eva wants to find the nth term of this sequence.

1, 5 , 9, 13, 17 ...

She knows that it starts with $4n$

Complete the nth term for this sequence.

Difference = 4, 4n gives 4, 8, 12, 16, 20; subtract 3

Answer $4n - 3$ [1]

[Turn over

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16 **(a)** Work out the size of an exterior angle of a 24-sided regular polygon.

Exterior angles add up to 360°
360 ÷ 24 = 15°

Answer *15* ° [2]

(b) The sum of the interior angles of a regular polygon is 1800°

Work out how many sides this polygon has.

180(n − 2) = 1800
n − 2 = 10
n = 12

Answer *12* [2]

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Question Number	**Marks**
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Examiner Number

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