Rewarding Learning

General Certificate of Secondary Education

Centre Number

Candidate Number

Mathematics

StemUp Model Solution

Unit M6 Paper 1
(Non-Calculator)
Foundation Tier



[GMC61]
Assessment

GMC61

Assessment Level of Control:
Tick the relevant box (✓)

Controlled Conditions	
Other	

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.

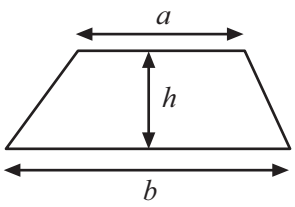
INFORMATION FOR CANDIDATES

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.

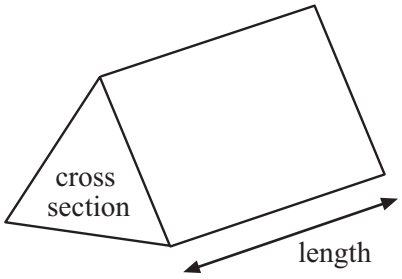
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Formula Sheet

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



Volume of prism = area of cross section × length



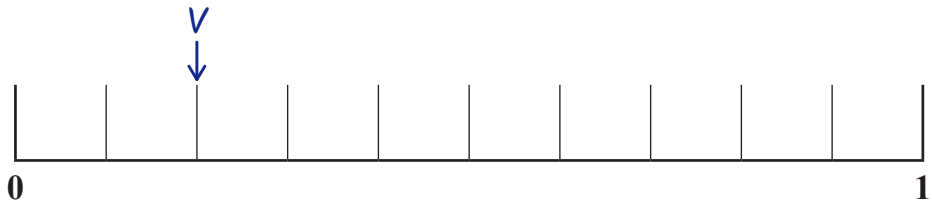
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1 Ben has five flags from Asia.

They are from Malaysia, Mongolia, Myanmar, Taiwan, and Vietnam.

Ben takes one of these flags at random.

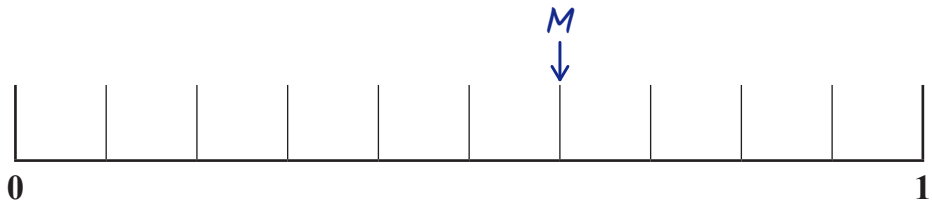
(a) Mark on the probability scale with a **V** the probability that the flag taken is Vietnam.



[1]

P(Vietnam) = $\frac{1}{5}$ = 0.2

(b) Mark on the probability scale with an **M** the probability that the flag taken is from a country beginning with the letter M.



[1]

Malaysia, Mongolia, Myanmar: $\frac{3}{5}$ = 0.6

[Turn over

2 **(a)** Circle the two units of capacity.

gallons miles pints pounds stones yards [1]

(b) Jack is 6 feet 3 inches tall.

Jill is 5 feet 8 inches tall.

1 foot = 12 inches.

How many inches taller is Jack than Jill?

Jack: 6 × 12 + 3 = 72 + 3 = 75 inches
Jill: 5 × 12 + 8 = 60 + 8 = 68 inches
75 − 68 = 7 inches

Answer 7 inches [2]

3 Use $5 \times 12 = 60$ $60 \div 5 = 12$ and $12 \div 5 = 2.4$

to complete the following.

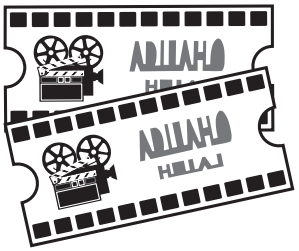
(a) 50 × 12 = 600 [1]

(b) 600 ÷ 5 = 120 [1]

(c) 12 ÷ 50 = 0.24 [1]

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4 A cinema has two screens.



500 people go to this cinema on a Saturday evening.

$\frac{3}{5}$ of these people go to screen 1

40% of the people who go to screen 2 are children.

How many children go to screen 2?

Show all your working.

Screen 1: $\frac{3}{5} \times 500 = 500 \div 5 \times 3 = 300$

Screen 2: 500 − 300 = 200 people

10% of 200 = 20

40% of 200 = 4 × 20 = 80 children

Answer 80 [3]

[Turn over

5 **(a)** Write in its simplest form the ratio 12 : 30

12 : 30 (÷ 6) = 2 : 5

Answer 2 : 5 [1]

(b) **(i)** Mark and Dylan have a number of toy bricks

in the ratio 3 : 2

What fraction of the bricks does Mark have?

3 + 2 = 5 parts, Mark has 3

Answer $\frac{3}{5}$ [1]

(ii) They have 35 bricks in total.

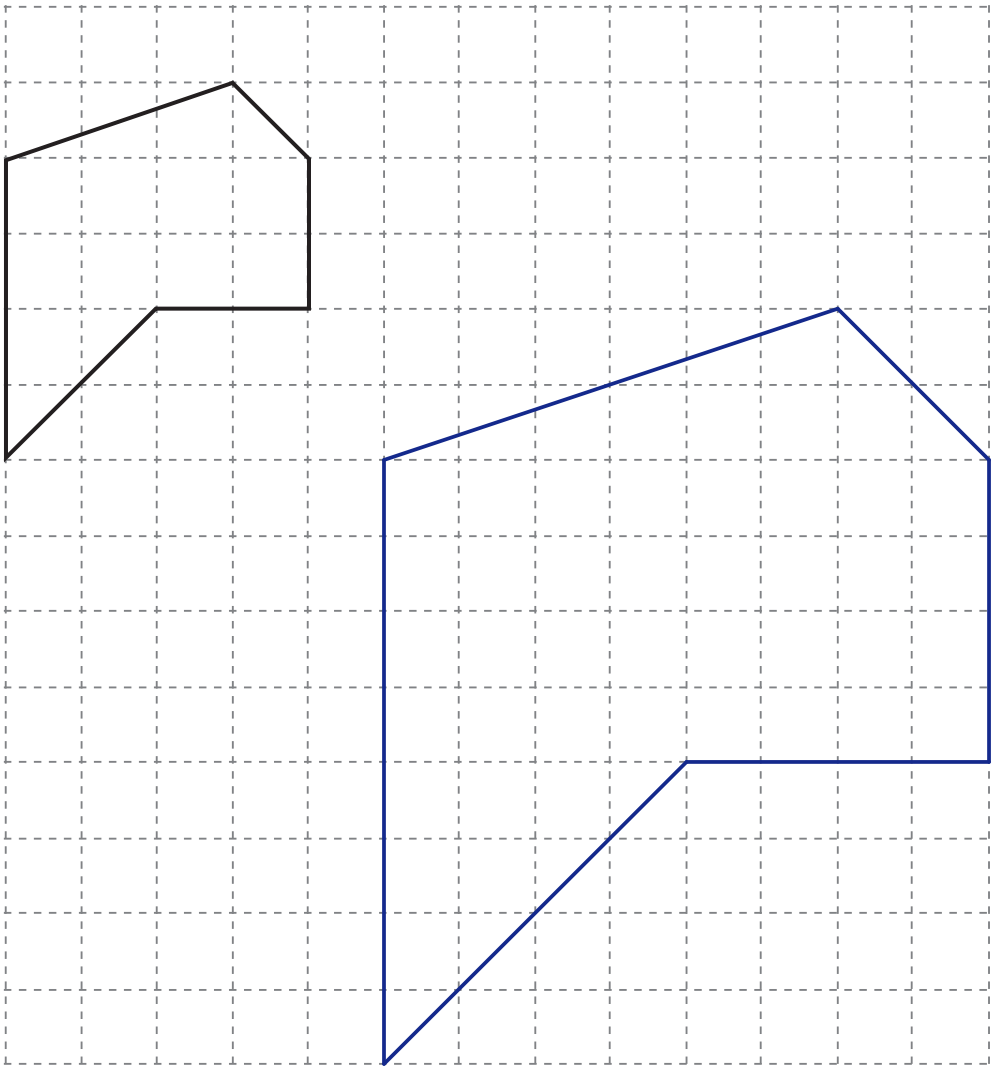
How many do they each have?

Mark: $\frac{3}{5}$ × 35 = 35 ÷ 5 × 3 = 21

Dylan: 35 − 21 = 14

Answer Mark has 21, Dylan has 14 [2]

6 On the grid, enlarge the shape with a scale factor of 2



[2]

[Turn over

7 Which of the numbers below shows that the following statement is not true?

"If P is any odd number, then P + 2 is always a prime number."

Show all working before you tick the correct box.

P = 1: 1 + 2 = 3 prime

P = 3: 3 + 2 = 5 prime

P = 5: 5 + 2 = 7 prime

P = 7: 7 + 2 = 9 = 3 × 3 not prime

P = 1	☐	P = 5	☐
P = 3	☐	P = 7	☑

[2]

8 In a Year 12 class, the following information was recorded.

	Boys	**Girls**
Wears glasses	3	5
Does not wear glasses	10	6

(a) What fraction of the pupils in the class wear glasses?

Glasses: 3 + 5 = 8 Total: 3 + 5 + 10 + 6 = 24

Answer $\frac{8}{24}$ [2]

(b) A pupil was chosen at random from the class.

What is the probability that the pupil was a boy who does not wear glasses?

Boys without glasses = 10

Answer $\frac{10}{24}$ [1]

(c) The next week a new boy joins the class.

He wears glasses.

Will this change the probability of now choosing at random a girl who wears glasses?

Explain your answer clearly.

Before: P(girl with glasses) = $\frac{5}{24}$

After: 25 pupils, still 5 girls wear glasses = $\frac{5}{25}$

Answer Yes because it changes from 5/24 to 5/25 (total is now 25) [2]

[Turn over

9 Change 20 miles/h to km/h.

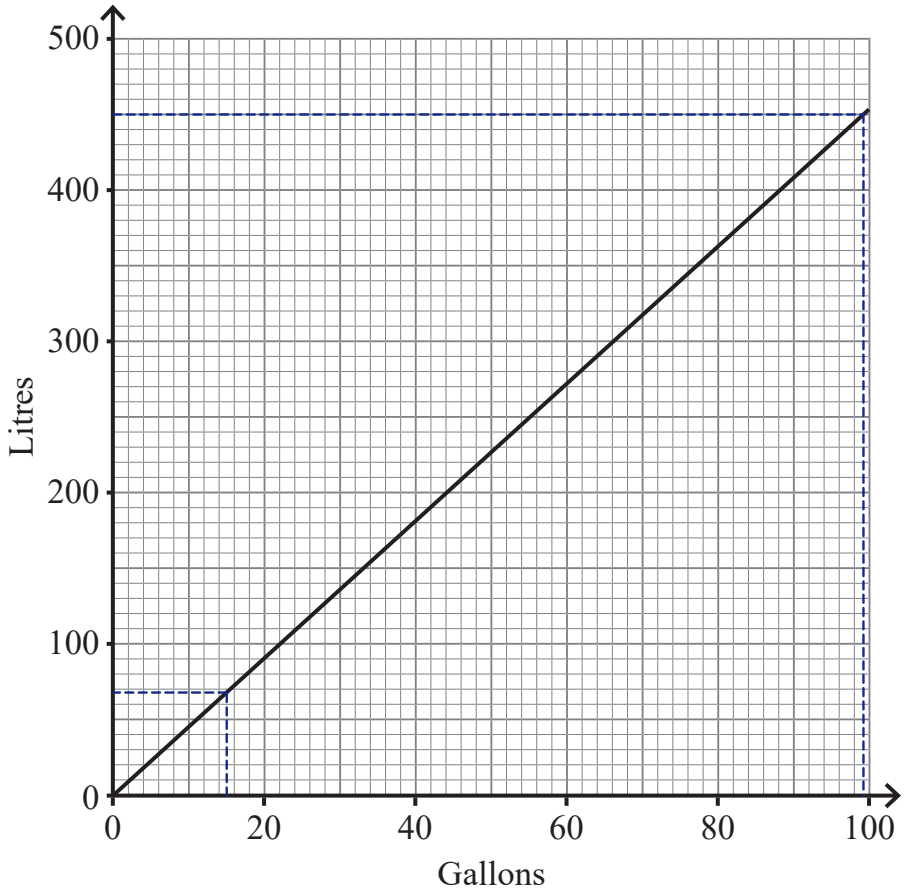
5 miles ≈ 8 km

20 miles = 4 × 5 miles

4 × 8 = 32 km/h

Answer 32 km/h [2]

10 Use this conversion graph to answer the following.



(a) An oil drum holds 15 gallons of oil.

How many litres of oil is this?

Answer 68 litres [1]

(b) An oil tank holds 900 litres of oil.

How many gallons of oil is this?

450 L ≈ 99 gallons, so 900 L ≈ 2 × 99 = 198

Answer 198 gallons [1]

(c) Complete this sentence.

100 gallons ≈ 450 litres, 450 ÷ 100 = 4.5

A gallon is about 4.5 times greater than a litre. [1]

[Turn over

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11 "Look Dad," said Erin.

"Here are all the silver coins from my piggy bank."

"How much have you got?" said Dad.

"$\frac{1}{3}$ are 5p coins, $\frac{1}{4}$ are 10p coins and the other 10 coins are 50p coins," said Erin.

What is Erin's total amount of money?

Show all working.

$\frac{1}{3} + \frac{1}{4} = \frac{4}{12} + \frac{3}{12} = \frac{7}{12}$ are 5p and 10p coins

50p coins: $1 - \frac{7}{12} = \frac{5}{12}$

$\frac{5}{12}$ = 10 coins, so $\frac{1}{12} = 10 \div 5 = 2$ coins

Total coins = $12 \times 2 = 24$

5p: $\frac{1}{3} \times 24 = 8$ coins 10p: $\frac{1}{4} \times 24 = 6$ coins

$8 \times 5p = 40p$, $6 \times 10p = 60p$, $10 \times 50p = 500p$

$40 + 60 + 500 = 600p = £6.00$

Answer £6.00 [5]

12 ABCDE is a pentagon.

Lines AF and CG are straight lines.

Work out the value of $x + y + z$

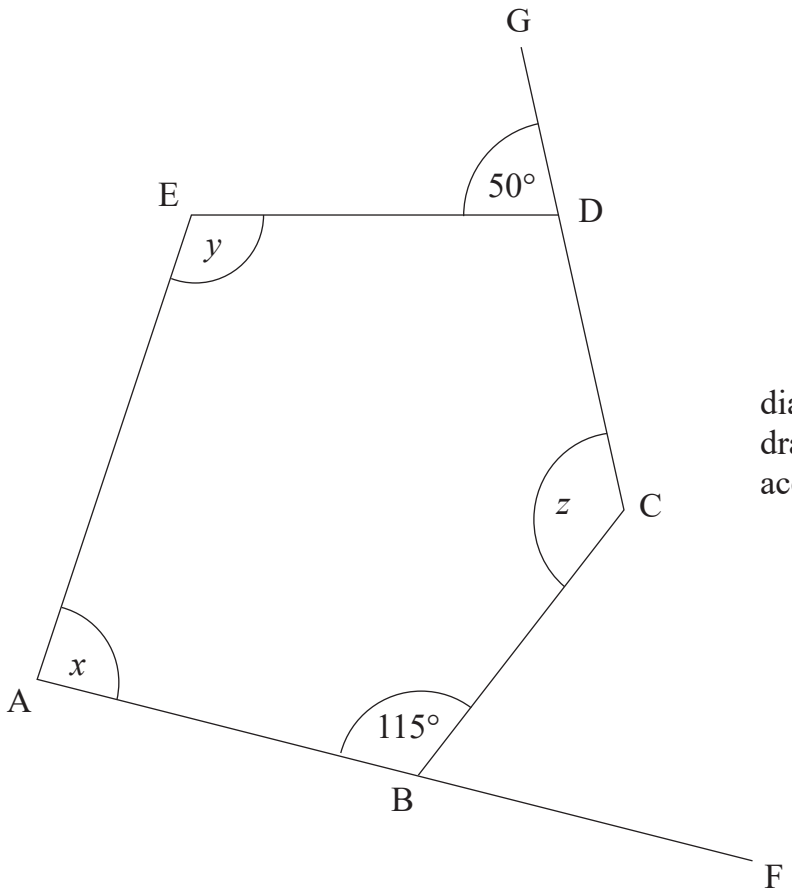


diagram not drawn accurately

Angle CDE = 180° – 50° = 130° (angles on a straight line)

Angle ABC = 115°

Angles in a pentagon = 3 triangles = 3 × 180° = 540°

115° + 130° = 245°

x + y + z = 540° – 245° = 295°

Answer 295 ° [5]

[Turn over

13 Simplify each of the following.

(a) $4p^3 \times 3p^4$

$4 \times 3 = 12, \quad p^3 \times p^4 = p^{3+4} = p^7$

Answer $12p^7$ [1]

(b) $(q^2)^3 \div q^8$

$(q^2)^3 = q^6, \quad q^6 \div q^8 = q^{6-8}$

Answer q^{-2} [1]

14 Find the nth term of the sequence

7, 4, 1, −2, ...

Difference = −3 → −3n

−3n: −3, −6, −9, −12

7 − (−3) = 10 → −3n + 10

Answer nth term = $-3n + 10$ [2]

15 Tony tests a six-sided dice which he thinks is biased towards the even numbers.

He carries out an experiment by rolling the dice.

He records the results as E (even) or O (odd).

E O E O E E O E E O E O

(a) What is the relative frequency of an even number?

E appears 7 times out of 12 rolls

Answer $\frac{7}{12}$ [1]

(b) How could Tony improve the experiment?

Answer Roll the dice many more times (increase the number of trials) [1]

16 Make y the subject of

$$3y - 12 = 4x$$

$3y = 4x + 12$

$y = \frac{4x + 12}{3}$

Answer $y = \frac{4x + 12}{3}$ [2]

[Turn over

17 A rectangle has a length of $3x$ cm and a width of $(x + 5)$ cm.

The length is greater than the width.

(a) Write this information as an inequality in x.

Answer $3x > x + 5$ [1]

(b) (i) Solve the inequality.

$3x > x + 5$

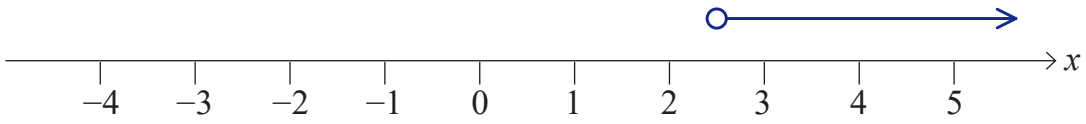
$3x - x > 5$

$2x > 5$

$x > 2.5$

Answer $x > 2.5$ [1]

(ii) Show your answer on the number line below.



[1]

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

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