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Elite Mathematics
Pearson Edexcel International GCSE

IGCSE LINEAR · 4MA1

4MA1/2H November 2025 Worked Solutions

November 2025 paper rebuilt with the worked solution after each question.

26	2020–2026	Single-paper solutions
paper questions	52 past papers	checked by Dr Eslam



Dr Eslam Ahmed
Assistant Lecturer, Faculty of Engineering, Cairo University
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PAST PAPER

4MA1/2H November 2025

November 2025

26	100	2 h
questions	marks	exam time

Each question is followed by its worked solution and final answer.

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Question 1

2 marks | Linear Graphs

1 The point P has coordinates $(3, 4)$
The point Q has coordinates $(9, 16)$

M is the midpoint of the line PQ

Find the coordinates of M

(..... , ...)

(Total for Question 1 is 2 marks)

WORKED SOLUTION

Question 1 · 4MA1/2H November 2025

1 Calculate value

$$P = (-3, 0), \qquad Q = (9, 16)$$

2 The midpoint is

The midpoint is

$$\left(\frac{-3+9}{2}, \frac{0+16}{2}\right)$$

$$= (3, 8)$$

FINAL ANSWER

$(3, 8)$.

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Question 2

3 marks | Simultaneous Equations

2 Solve the simultaneous equations

$$5x + y = 11$$
$$3x - y = 9$$

Show clear algebraic working.

$x =$ .....

$y =$ .....

(Total for Question 2 is 3 marks)

WORKED SOLUTION

Question 2 · 4MA1/2H November 2025

1 Solve simultaneous equations

$$5x + y = 11$$

$$3x - y = 9$$

2 Add the equations

Add the equations:

$$8x = 20$$

$$x = 2.5$$

3 Solve simultaneous equations

Substitute into $5x + y = 11$:

$$5(2.5) + y = 11$$

$$y = -1.5$$

FINAL ANSWER

$x = 2.5$, $y = -1.5$.

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Question 3

4 marks | Fractions

3 A box contains only

9 red bricks
43 blue bricks
and some yellow bricks

$\frac{7}{20}$ of the bricks are yellow bricks.

Each brick weighs 35 grams.

Work out the total weight of the yellow bricks.

..... grams

(Total for Question 3 is 4 marks)

WORKED SOLUTION

Question 3 · 4MA1/2H November 2025

1 There are red and blue

There are $9 + 43 = 52$ red and blue bricks.

2 Simplify fraction

Let the total number of bricks be T.

3 Simplify fraction

Since $\frac{7}{20}$ of the bricks are yellow, the remaining fraction is

$$1 - \frac{7}{20} = \frac{13}{20}$$

4 Simplify fraction

So

$$\frac{13}{20}T = 52$$

$$T = 52 \times \frac{20}{13} = 80$$

5 **Yellow bricks**

Yellow bricks:

$$\frac{7}{20} \times 80 = 28$$

6 **Simplify fraction**

Each brick weighs 35 grams, so total yellow-brick weight is

$$28 \times 35 = 980$$

✓ **FINAL ANSWER**

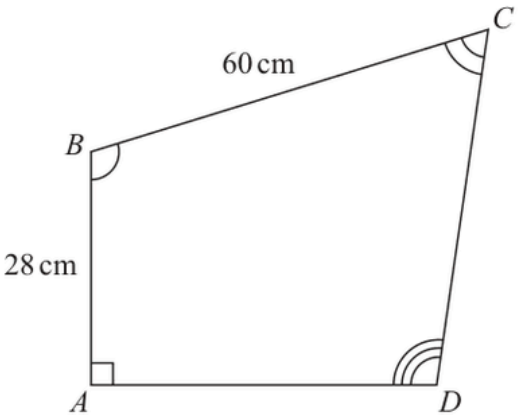
980 grams

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Question 4

3 marks | Similar Shapes

4 Here are three similar quadrilaterals.



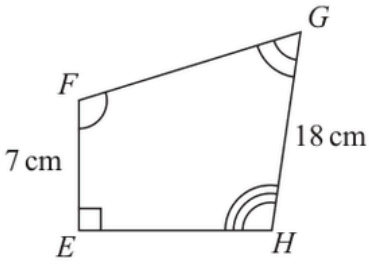
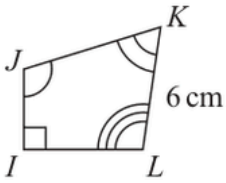


Diagram **NOT** accurately drawn



Work out the length of JK

..... cm

(Total for Question 4 is 3 marks)

WORKED SOLUTION

Question 4 · 4MA1/2H November 2025

1 The scale factor from the

The scale factor from the largest quadrilateral to the middle quadrilateral is

$$\frac{7}{28} = \frac{1}{4}$$

2 Evaluate fraction

So the side corresponding to $60\ \text{cm}$ in the middle shape is

$$60 \times \frac{1}{4} = 15$$

3 The scale factor from the

The scale factor from the middle quadrilateral to the smallest quadrilateral is

$$\frac{6}{18} = \frac{1}{3}$$

$$JK = 15 \times \frac{1}{3} = 5$$

FINAL ANSWER

5 cm.

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Question 5

6 marks | Compound Interest & Depreciation

5 Otis sells ice creams.

On Friday, Otis sells 75 ice creams.
On Saturday, Otis sells 87 ice creams.

(a) Work out the percentage increase in the number of ice creams Otis sells from Friday to Saturday.

.....%
(3)

Claudia buys an ice cream machine for 960 Swiss francs.

The value of the ice cream machine depreciates by 20% each year.

(b) Work out the value of the ice cream machine at the end of 3 years.

..... Swiss francs
(3)

(Total for Question 5 is 6 marks)

WORKED SOLUTION

Question 5 · 4MA1/2H November 2025

1 Use compound interest

For part (a), the increase is

$$87 - 75 = 12$$

2 Percentage increase

Percentage increase:

$$\frac{12}{75} \times 100 = 16$$

3 Use compound interest

For part (b), a depreciation of 20% gives multiplier

$$0.80$$

4 **Use compound interest**

After 3 years,

$$960(0.80)^3 = 491.52$$

✓ **FINAL ANSWER**

(a) 16%, (b) 491.52 Swiss francs

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Question 6

5 marks | Circles, Arcs & Sectors

6 A large circle with centre O contains 3 identical small circles.
Each circle touches two other circles.

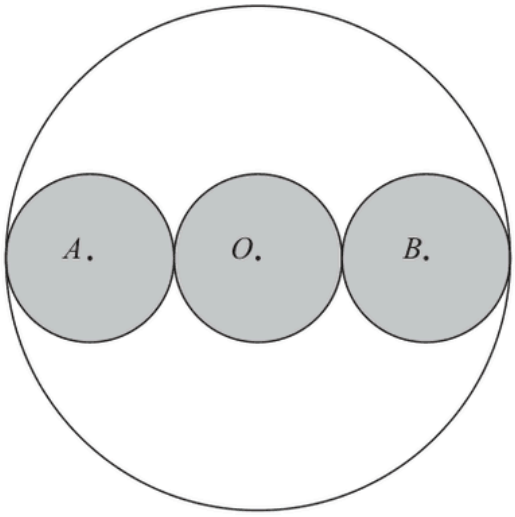


Diagram **NOT** accurately drawn

A, O and B are the centres of the small circles.
AOB is a straight line.

The circumference of the large circle is 160 cm

Work out the area of one small circle.
Give your answer correct to 3 significant figures.

..... cm^2

(Total for Question 6 is 5 marks)

WORKED SOLUTION

Question 6 · 4MA1/2H November 2025

1 **The circumference of the large**

The circumference of the large circle is $160\ \text{cm}$, so

$$2\pi R = 160$$

$$R = \frac{80}{\pi}$$

2 The three equal small circles

The three equal small circles fit along the diameter of the large circle, so

$$2R = 6r$$

$$r = \frac{R}{3} = \frac{80}{3\pi}$$

3 Area of one small circle

Area of one small circle is

$$\pi r^2 = \pi\left(\frac{80}{3\pi}\right)^2$$

$$= 226.35\ldots$$

FINAL ANSWER

$226\ \text{cm}^2$ to 3 significant figures.

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Question 7

3 marks | Factorising

7 (i) Factorise $x^2 + 2x - 48$

.....

(2)

(ii) Hence, solve $x^2 + 2x - 48 = 0$

.....

(1)

(Total for Question 7 is 3 marks)

WORKED SOLUTION

Question 7 · 4MA1/2H November 2025

1 Factorise expression

$$x^2 + 2x - 48 = (x + 8)(x - 6)$$

2 Factorise expression

So

$$(x + 8)(x - 6) = 0$$

FINAL ANSWER

$x = -8$ or $x = 6$

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Question 8

3 marks | Standard Form

8 (a) Write 5.76×10^4 as an ordinary number.

.....

(1)

(b) Work out $\dfrac{3 \times 10^5 + 8 \times 10^3}{4 \times 10^{-2}}$

Give your answer in standard form.

.....

(2)

(Total for Question 8 is 3 marks)

WORKED SOLUTION

Question 8 · 4MA1/2H November 2025

1 Convert standard form

$$5.76 \times 10^4 = 57600$$

2 Convert standard form

For part (b), simplify the numerator:

$$3 \times 10^5 + 8 \times 10^3 = 300000 + 8000 = 308000$$

3 Convert standard form

Then

$$\frac{308000}{4 \times 10^{-2}} = \frac{308000}{0.04} = 7700000$$

4 In standard form

In standard form:

$$7700000 = 7.7 \times 10^6$$

FINAL ANSWER

(a) 57600, (b) 7.7×10^6

Question 9

3 marks | Probability Toolkit

9 Mark has three bags, bag A, bag B and bag C

Bag A contains 120 counters.
The probability of taking at random a red counter from bag A is 0.45

Bag B contains 80 counters.
The probability of taking at random a red counter from bag B is 0.3

Bag C is empty.

Mark puts all the counters from bag A and bag B into bag C

Mark takes at random a counter from bag C

Work out the probability that he takes a red counter.

.....

(Total for Question 9 is 3 marks)

1 Red counters in each bag

Bag A: $120 \times 0.45 = 54$. Bag B: $80 \times 0.3 = 24$.

2 Probability of red from bag C

Bag C has $54 + 24 = 78$ red counters out of $120 + 80 = 200$.

$$\frac{78}{200} = 0.39$$

FINAL ANSWER

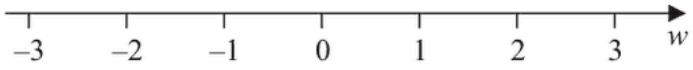
0.39

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Question 10

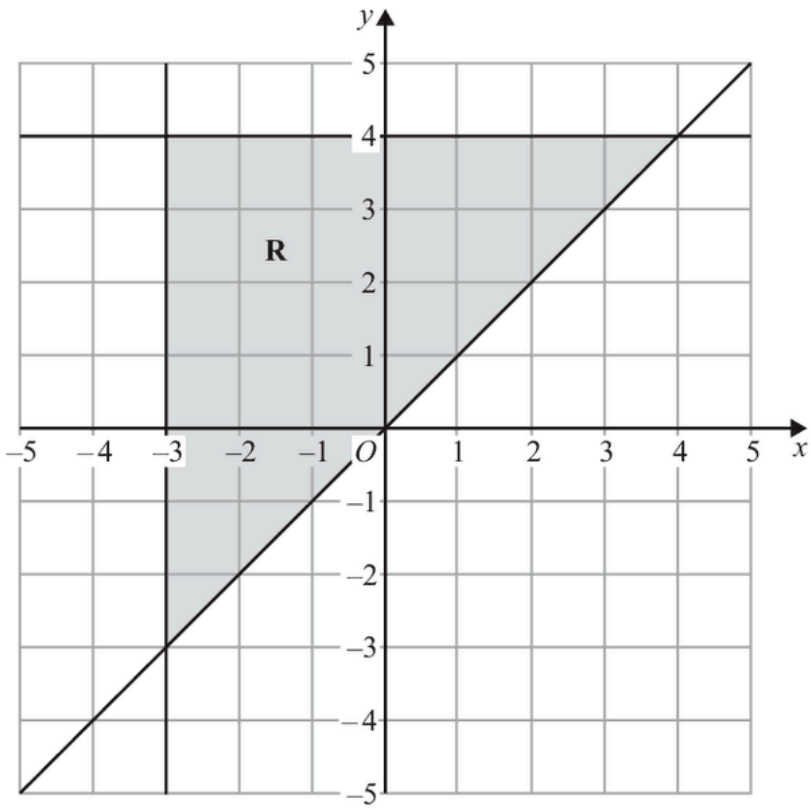
4 marks | Inequalities (Solving & Graphing)

10 (a) On the number line, represent the inequality $w < 1$



(1)

The region **R**, shown shaded in the diagram, is bounded by three straight lines.



(b) Write down the three inequalities that define the region **R**

.....

(3)

(Total for Question 10 is 4 marks)

WORKED SOLUTION

Question 10 · 4MA1/2H November 2025

1 **Read the graph**

For part (a), $w < 1$ is shown with an open circle at 1 and an arrow to the left.

2 **Read the graph**

For part (b), the region is right of $x = -3$, below $y = 4$, and above $y = x$:

$$x \geq -3$$

$$y \leq 4$$

$$y \geq x$$

FINAL ANSWER

(a) Open circle at 1, shade left. (b) $x \geq -3$, $y \leq 4$, $y \geq x$.

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Question 11

4 marks | Right-Angled Triangles - Pythagoras & Trigonometry

11 The diagram shows a right-angled triangle ABC

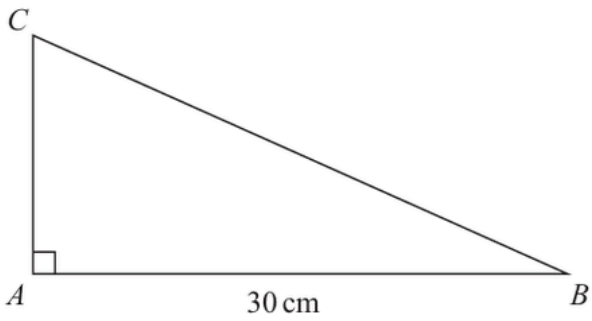


Diagram **NOT** accurately drawn

Area of triangle $ABC = 240\,\text{cm}^2$

Work out the perimeter of triangle ABC

..... cm

(Total for Question 11 is 4 marks)

WORKED SOLUTION

Question 11 · 4MA1/2H November 2025

1 Use the area to find

Use the area to find AC:

$$\frac{1}{2} \times 30 \times AC = 240$$

$$15AC = 240$$

$$AC = 16$$

2 Use trigonometry

Then

$$BC^2 = 30^2 + 16^2 = 1156$$

$$BC = 34$$

3 **Perimeter**

Perimeter:

$$30 + 16 + 34 = 80$$

✓ **FINAL ANSWER**

$80\ \text{cm}$.

Question 12

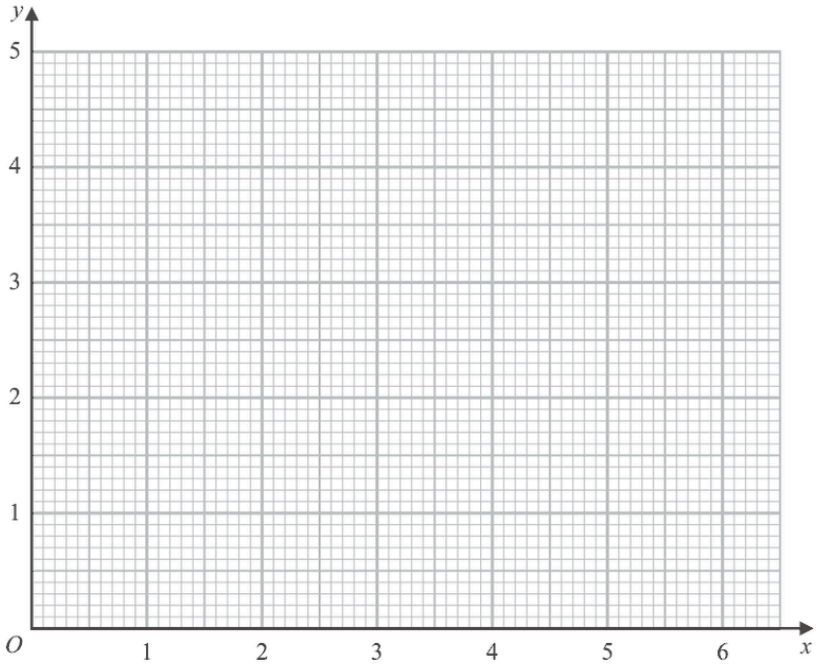
5 marks | Graphs of Functions

12 (a) Complete the table of values for $y = \frac{1}{2}\left(x + \frac{4}{x}\right)$

x	0.5	1	2	3	4	5	6
y	4.25			2.17	2.5	2.9	3.33

(1)

(b) Draw the graph of $y = \frac{1}{2}\left(x + \frac{4}{x}\right)$ for $0.5 \leqslant x \leqslant 6$



(2)

(c) By drawing a suitable line on the grid, find estimates for the solutions of the equation $x + \frac{4}{x} = 6$

Give your answers correct to one decimal place.

.....

(2)

(Total for Question 12 is 5 marks)

1 **Read the graph**

$$y = \frac{1}{2}\left(x + \frac{4}{x}\right)$$

2 **The completed table is**

The completed table is:

x	0.5	1	2	3	4	5	6
y	4.25	2.5	2	2.17	2.5	2.9	3.33

3 **Read the graph**

For

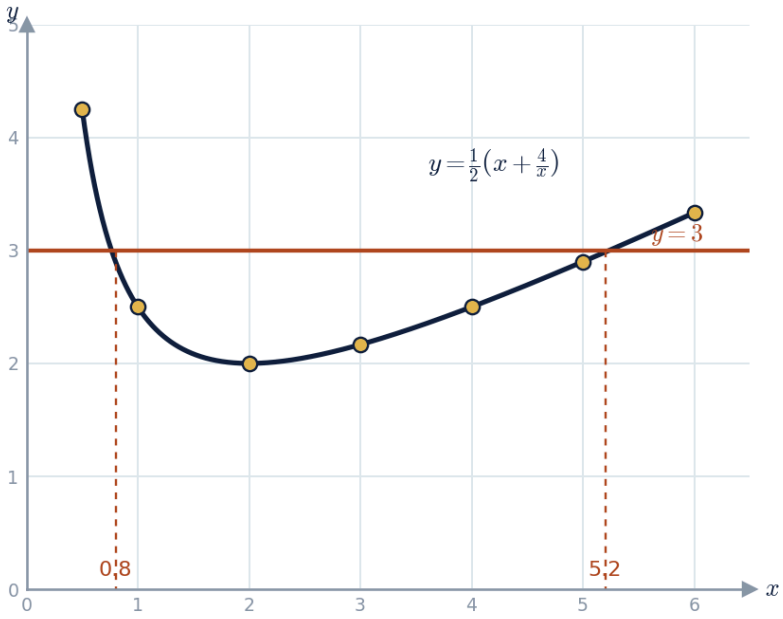
$$x + \frac{4}{x} = 6$$

we need

$$\frac{1}{2}\left(x + \frac{4}{x}\right) = 3$$

4 **Read the graph**

So draw the horizontal line $y = 3$ on the graph.



5 **The intersections give approximately**

The intersections give approximately

$$x = 0.8 \quad \text{and} \quad x = 5.2$$

FINAL ANSWER

Table missing values $2.5, 2$. Estimates 0.8 and 5.2.

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Question 13

4 marks | Algebraic Roots & Indices

13 (a) Simplify fully $\left(\frac{125x^6}{y^{15}}\right)^3$

.....

(2)

Given that $4^n = \frac{4^m}{64^p}$

(b) Express n in terms of m and p

$n =$ .....

(2)

(Total for Question 13 is 4 marks)

WORKED SOLUTION

Question 13 · 4MA1/2H November 2025

1 **(a)**

(a)

$$\left(\frac{125x^6}{y^{15}}\right)^{1/3} = \frac{5x^2}{y^5}$$

2 **(b)**

(b)

$$64^p = (4^3)^p = 4^{3p}$$

$$4^n = \frac{4^m}{64^p} = \frac{4^m}{4^{3p}} = 4^{m-3p}$$

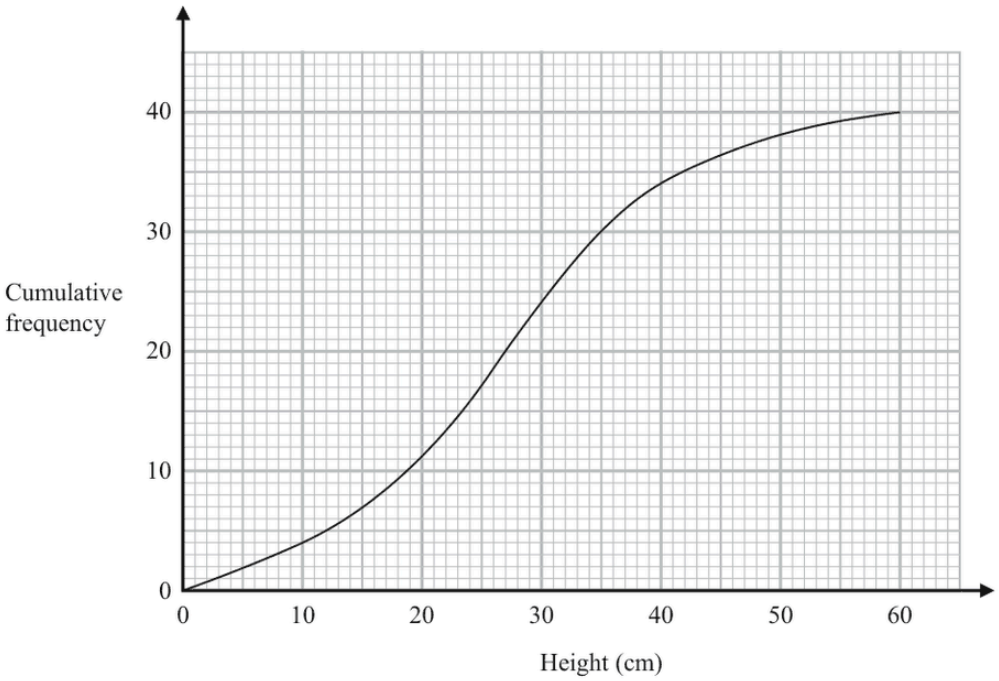
✓ **FINAL ANSWER**

(a) $\frac{5x^2}{y^5}$, (b) $n = m - 3p$

Question 14

5 marks | Cumulative Frequency Diagrams

14 The cumulative frequency graph shows information about the heights of 40 plants that Greta has grown.



(a) Use the graph to find an estimate for the median height.

..... cm

(1)

(b) Use the graph to find an estimate for the interquartile range of the heights.

..... cm

(2)

Plants with a height greater than 40 cm are premium plants.
Greta sells all the premium plants for 30 euros each.

(c) Work out the total amount of money Greta receives for the premium plants.

..... euros

(2)

(Total for Question 14 is 5 marks)

1

(a) Median

Read across from $\frac{40}{2} = 20$: about 27 cm.

2

(b) Interquartile range

Lower quartile at 10: about 19 cm. Upper quartile at 30: about 35 cm.

$$\text{IQR} \approx 35 - 19 = 16 \text{ cm}$$

3

(c) Premium plants

At 40 cm the curve reads about 34, so $40 - 34 = 6$ plants are taller than 40 cm.

$$6 \times 30 = 180 \text{ euros}$$

✓ **FINAL ANSWER**

(a) about 27 cm (b) about 16 cm (c) 180 euros

Question 15

4 marks | Circle Theorems

15 A, B, C and D are points on a circle with centre O

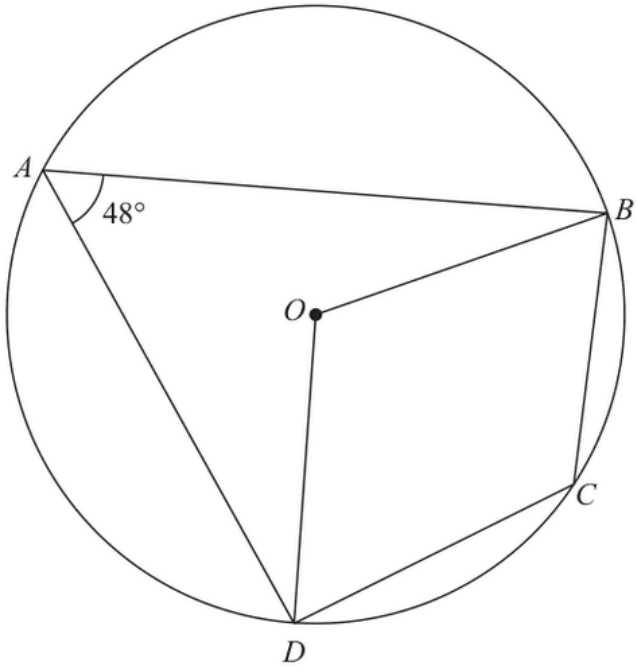


Diagram **NOT** accurately drawn

Angle $DAB = 48°$

(a) (i) Work out the size of the obtuse angle DOB

.....°

(1)

(ii) Give a reason for your answer.

.....

(1)

(b) (i) Work out the size of angle BCD

.....°

(1)

(ii) Give a reason for your answer.

.....

(1)

(Total for Question 15 is 4 marks)

1 **(a) The angle at the**

(a) The angle at the centre is twice the angle at the circumference standing on chord DB:

$$\angle DOB = 2 \times 48^\circ = 96^\circ$$

2 **(b) Opposite angles in cyclic**

(b) Opposite angles in cyclic quadrilateral $ABCD$ add to 180°:

$$\angle BCD = 180^\circ - 48^\circ = 132^\circ$$

✓ **FINAL ANSWER**

$\angle DOB = 96^\circ$, and $\angle BCD = 132^\circ$.

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Question 16

2 marks | Algebraic Proof

16 Use algebra to show that $0.3\dot{7}\dot{8} = \frac{25}{66}$

(Total for Question 16 is 2 marks)

WORKED SOLUTION

Question 16 · 4MA1/2H November 2025

1 Let

Let

$$x = 0.3787878\ldots$$

2 Calculate value

Then

$$10x = 3.787878\ldots$$

3 Calculate value

and

$$1000x = 378.787878\ldots$$

4 Subtract

Subtract:

$$990x = 375$$

$$x = \frac{375}{990} = \frac{25}{66}$$

FINAL ANSWER

$0.3787878\ldots = \frac{25}{66}$.

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Question 17

3 marks | Direct & Inverse Proportion

17 T is inversely proportional to $\sqrt{m}$

$T = 15$ when $m = 36$

Find a formula for T in terms of m

(Total for Question 17 is 3 marks)

WORKED SOLUTION

Question 17 · 4MA1/2H November 2025

1 Find inverse function

T is inversely proportional to m, so

$$T = \frac{k}{m}$$

2 Use when

Use $T = 15$ when $m = 36$:

$$15 = \frac{k}{36}$$

$$k = 540$$

3 Find inverse function

Therefore

$$T = \frac{540}{m}$$

FINAL ANSWER

$T = \frac{540}{m}$.

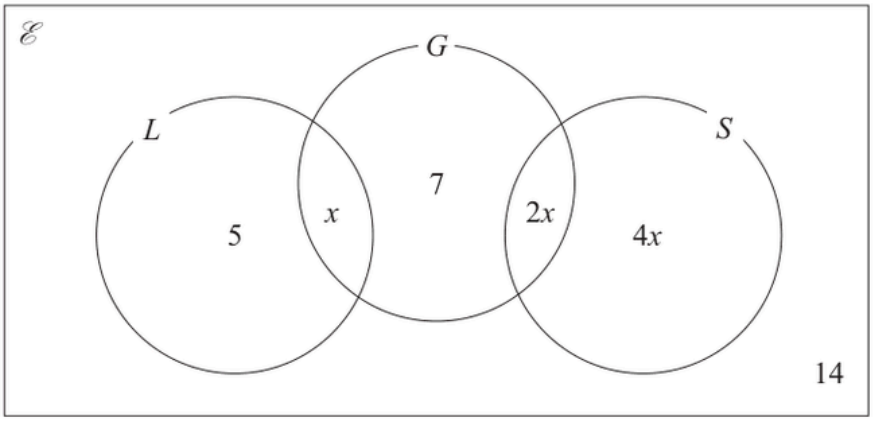
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Question 18

3 marks | Set Notation & Venn Diagrams

18 Bianca asked 40 students which of the languages Latin (L), Greek (G) and Sanskrit (S) they study.

The Venn diagram gives some information about her results.
It shows the number of students in each subset.



One of these students is selected at random.
Work out the probability that this student studies Latin or Sanskrit.

(Total for Question 18 is 3 marks)

WORKED SOLUTION

Question 18 · 4MA1/2H November 2025

1 Find x (all regions add to 40)

$$5 + x + 7 + 2x + 4x + 14 = 40 \Rightarrow 26 + 7x = 40 \Rightarrow x = 2$$

2 Latin or Sanskrit

Regions in L or S: $5 + x + 2x + 4x = 5 + 2 + 4 + 8 = 19$.

$$\frac{19}{40}$$

✓ **FINAL ANSWER**

$$\frac{19}{40}$$

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Question 19

3 marks | Functions

19 The functions f and g are such that

$$f(x) = 3x - 2 \qquad g(x) = \frac{x}{2x - 1}$$

(a) Find g(3)

.....

(1)

(b) Find gf(x)
Give your answer in its simplest form.

gf(x) = ...

(2)

(Total for Question 19 is 3 marks)

WORKED SOLUTION

Question 19 · 4MA1/2H November 2025

1 **Evaluate fraction**

$$f(x) = 3x - 2, \qquad g(x) = \frac{x}{x - 1}$$

2 **(a)**

(a)

$$g(3) = \frac{3}{3 - 1} = \frac{3}{2}$$

3 **(b)**

(b)

$$gf(x) = g(f(x))$$

$$gf(x) = \frac{3x - 2}{(3x - 2) - 1}$$

$$gf(x) = \frac{3x - 2}{3x - 3}$$

FINAL ANSWER

$g(3) = \frac{3}{2}$, and $gf(x) = \dfrac{3x-2}{3x-3}$.

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Question 20

3 marks | Forming & Solving Equations

20 Here is a quadratic equation.

$$ax^2 + 4x + c = 0$$

The solutions of this equation are given by $x = \dfrac{-4 \pm 2\sqrt{39}}{10}$

Find the value of a and the value of c
Show your working clearly.

$a =$ .....

$c =$ .....

(Total for Question 20 is 3 marks)

WORKED SOLUTION

Question 20 · 4MA1/2H November 2025

1 Calculate value

For

$$ax^2 + 4x + c = 0$$

2 the quadratic formula gives

the quadratic formula gives

$$x = \frac{-4 \pm \sqrt{4^2 - 4ac}}{2a}$$

3 The given solutions are

The given solutions are

$$x = \frac{-4 \pm 2\sqrt{39}}{10}$$

4 Compare denominators

Compare denominators:

$$2a = 10$$

$$a = 5$$

5 **Compare the square root parts**

Compare the square root parts:

$$\sqrt{16 - 4ac} = 2\sqrt{39}$$

6 **Square both sides**

Square both sides:

$$16 - 4ac = 156$$

7 **Use**

Use $a = 5$:

$$16 - 20c = 156$$

$$-20c = 140$$

$$c = -7$$

✓ **FINAL ANSWER**

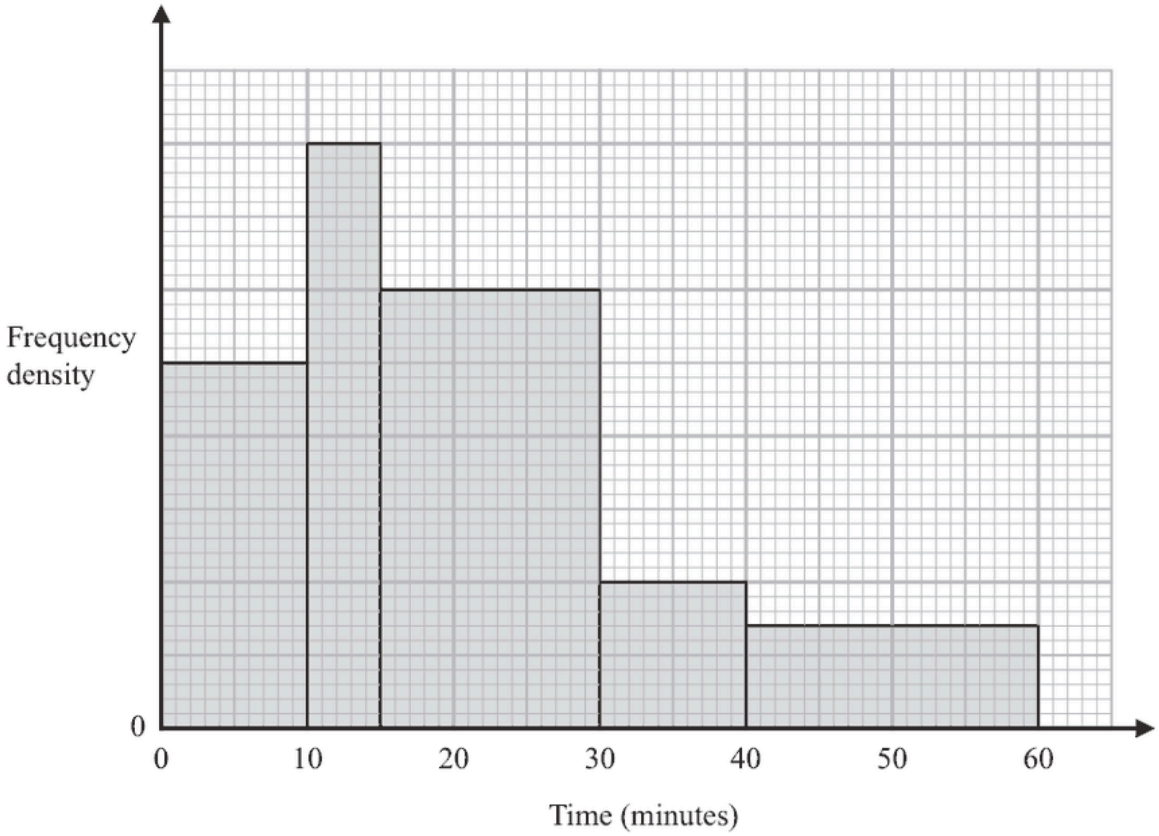
$a = 5,\ c = -7$

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Question 21

3 marks | Histograms

21 The histogram shows information about the times, in minutes, that some trains arrived late at a station one day.



20 of these trains arrived between 10 minutes late and 15 minutes late.

No trains arrived more than 60 minutes late.

Work out an estimate for the number of these trains that arrived at least 25 minutes late.

(Total for Question 21 is 3 marks)

WORKED SOLUTION

Question 21 · 4MA1/2H November 2025

1 **Use histogram**

For a histogram,

$$\text{frequency} = \text{class width} \times \text{frequency density}$$

2 **Use frequency table**

For $10 < t \leq 15$, the frequency is 20 and the class width is 5, so

$$\text{frequency density} = \frac{20}{5} = 4$$

---

3 **Use histogram**

Using this scale from the histogram:

$$15 < t \leq 30 \quad \text{has frequency density } 3$$

$$30 < t \leq 40 \quad \text{has frequency density } 1$$

$$40 < t \leq 60 \quad \text{has frequency density } 0.7$$

---

4 **Calculate value**

For trains at least 25 minutes late:

$$(5)(3) + (10)(1) + (20)(0.7)$$

$$= 15 + 10 + 14$$

$$= 39$$

✓ **FINAL ANSWER**

39 trains

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Question 22

6 marks | Differentiation & Turning Points

22 Curve **C** has equation $y = x^3 - 16x + 7$

At two points on **C**, the gradient is 11
The tangents to **C** at these two points have equations of the form $y = ax + b$

Work out the two possible values of b
Show clear algebraic working.

(Total for Question 22 is 6 marks)

WORKED SOLUTION

Question 22 · 4MA1/2H November 2025

1 Differentiate

$$y = x^3 - 16x + 7$$

2 Differentiate

Differentiate:

$$\frac{dy}{dx} = 3x^2 - 16$$

3 The gradient of the tangent

The gradient of the tangent is 11, so

$$3x^2 - 16 = 11$$

$$3x^2 = 27$$

$$x^2 = 9$$

$$x = 3 \quad \text{or} \quad x = -3$$

4 Differentiate

When $x = 3$:

$$y = 3^3 - 16(3) + 7 = 27 - 48 + 7 = -14$$

5 **Use trigonometry**

The tangent has equation $y = 11x + b$, so

$$-14 = 11(3) + b$$

$$b = -47$$

---

6 **Differentiate**

When $x = -3$:

$$y = (-3)^3 - 16(-3) + 7 = -27 + 48 + 7 = 28$$

$$28 = 11(-3) + b$$

$$b = 61$$

✓ **FINAL ANSWER**

$\boxed{b = -47 \text{ or } b = 61}$

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Question 23

3 marks | Area & Volume of Similar Shapes

23 Shape **P** is similar to shape **Q**

The table shows some information about shape **P** and shape **Q**

	Surface area (cm^2)	Volume (cm^3)
Shape **P**	200	672
Shape **Q**	450	

Work out the volume of shape **Q**

..... cm^3

(Total for Question 23 is 3 marks)

WORKED SOLUTION

Question 23 · 4MA1/2H November 2025

1 **Surface area ratio Q P**

Surface area ratio Q:P:

$$450 : 200 = 9 : 4$$

2 **Split the ratio**

So the linear ratio Q:P is

$$3 : 2$$

3 **Split the ratio**

Therefore the volume ratio Q:P is

$$3^3 : 2^3 = 27 : 8$$

4 **Shape P has volume**

Shape P has volume $672\ \text{cm}^3$.

5 **Volume of Q**

Volume of Q:

$$672 \times \frac{27}{8} = 2268$$

FINAL ANSWER

$\boxed{2268\ \text{cm}^3}$

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Question 24

5 marks | Rounding, Estimation & Bounds

24 $D = \dfrac{n}{p - q}$

$n = 10.3$ correct to 1 decimal place
$p = 7.24$ correct to 2 decimal places
$q = 4.39$ correct to 2 decimal places

By considering bounds, work out the value of D to a suitable degree of accuracy.
Show your working clearly.

(Total for Question 24 is 5 marks)

WORKED SOLUTION

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1 Estimate the value

$$D = \frac{n}{p - q}$$

2 Bounds

Bounds:

$$10.25 \leq n < 10.35$$

$$7.235 \leq p < 7.245$$

$$4.385 \leq q < 4.395$$

3 Lower bound

Lower bound:

$$D_{\text{lower}} = \frac{10.25}{7.245 - 4.385} = 3.5839\ldots$$

4 Upper bound

Upper bound:

$$D_{\text{upper}} = \frac{10.35}{7.235 - 4.395} = 3.6443\ldots$$

5 **Estimate the value**

So

$$3.5839\ldots < D < 3.6443\ldots$$

6 **Estimate the value**

Both bounds round to $\mathbf{3.6}$ to 1 decimal place.

✓ **FINAL ANSWER**

$D = \mathbf{3.6}$ to a suitable degree of accuracy

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Question 25

5 marks | Sequences

25 The first term of an arithmetic series is 10
The 20th term of the series is 86

The sum of the first N terms of the series is 5194

Work out the value of N
Show your working clearly.

$N =$ .....

(Total for Question 25 is 5 marks)

WORKED SOLUTION

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1 Calculate value

$$a = 10$$

$$u_{20} = 86$$

$$10 + 19d = 86$$

$$d = 4$$

2 **Use**

Use

$$S_N = \frac{N}{2}(2a + (N-1)d)$$

$$5194 = \frac{N}{2}(20 + 4(N-1))$$

$$5194 = \frac{N}{2}(4N + 16)$$

$$5194 = 2N(N+4)$$

$$N^2 + 4N - 2597 = 0$$

$$N = \frac{-4 + 102}{2} = 49$$

FINAL ANSWER

$N = 49$

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Question 26

6 marks | Standard & Compound Units

26 A solid cone is joined to a solid hemisphere to make the solid shown below.

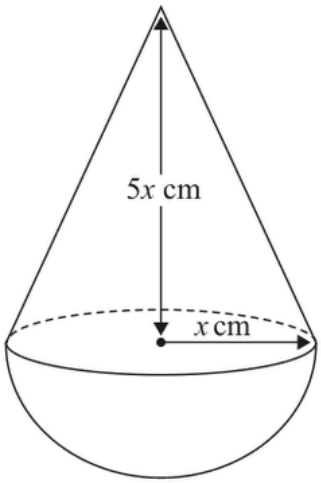


Diagram **NOT** accurately drawn

The cone is made from copper.
The density of copper is $9\,\text{g/cm}^3$

The hemisphere is made from a different metal.

The total mass of the solid is 4752π grams
The total volume of the solid is $504\pi\,\text{cm}^3$

Work out the density of the hemisphere.
Show your working clearly.

..... g/cm^3

(Total for Question 26 is 6 marks)

WORKED SOLUTION

Question 26 · 4MA1/2H November 2025

1 **Volume of cone**

Volume of cone:

$$\frac{1}{3}\pi x^2(5x) = \frac{5}{3}\pi x^3$$

2 **Volume of hemisphere**

Volume of hemisphere:

$$\frac{2}{3}\pi x^3$$

3 **Total volume**

Total volume:

$$\frac{5}{3}\pi x^3 + \frac{2}{3}\pi x^3 = 504\pi$$

$$\frac{7}{3}\pi x^3 = 504\pi$$

$$x^3 = 216$$

$$x = 6$$

4 **Cone volume**

Cone volume:

$$\frac{5}{3}\pi(6)^3 = 360\pi$$

5 **Mass of copper cone**

Mass of copper cone:

$$360\pi \times 9 = 3240\pi$$

6 **Mass of hemisphere**

Mass of hemisphere:

$$4752\pi - 3240\pi = 1512\pi$$

7 **Hemisphere volume**

Hemisphere volume:

$$\frac{2}{3}\pi(6)^3 = 144\pi$$

8 **Density of the hemisphere**

Density of the hemisphere:

$$\frac{1512\pi}{144\pi} = 10.5$$

FINAL ANSWER

$10.5\ \text{g/cm}^3$