AQA

Please write clearly in block capitals.

Centre number | | | | | | Candidate number | | | | |

Surname _____

Forename(s) _____

Candidate signature _____

I declare this is my own work.

GCSE MATHEMATICS

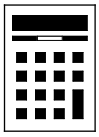
H

Higher Tier Paper 2 Calculator

Friday 7 November 2025 Morning Time allowed: 1 hour 30 minutes

Materials

For this paper you must have:



- a calculator
- mathematical instruments
- the Formulae Sheet (enclosed).

Instructions

- Use black ink or black ball-point pen. Draw diagrams in pencil.
- Fill in the boxes at the top of this page.
- Answer **all** questions.
- You must answer the questions in the spaces provided. Do not write outside the box around each page or on blank pages.
- If you need extra space for your answer(s), use the lined pages at the end of this book. Write the question number against your answer(s).
- Do all rough work in this book. Cross through any work you do not want to be marked.

Information

- The marks for questions are shown in brackets.
- The maximum mark for this paper is 80.
- You may ask for more answer paper, graph paper and tracing paper.
- These must be tagged securely to this answer book.

Advice

In all calculations, show clearly how you work out your answer.

For Examiner's Use	
Pages	Mark
2–3	
4–5	
6–7	
8–9	
10–11	
12–13	
14–15	
16–17	
18–19	
20–21	
22–23	
24–25	
26–27	
TOTAL	

Answer **all** questions in the spaces provided.

Do not write outside the box

1 (a) Multiply out and simplify fully $(x + 5)(x - 12)$

[2 marks]

Answer _____

1 (b) Simplify fully $\left(3t^4\right)^2$

[2 marks]

Answer _____

Do not write outside the box

1 (c) Factorise fully $3w^2 + 12w$

[2 marks]

Answer _____

1 (d) Factorise fully $x^2 + 9x + 18$

[2 marks]

Answer _____

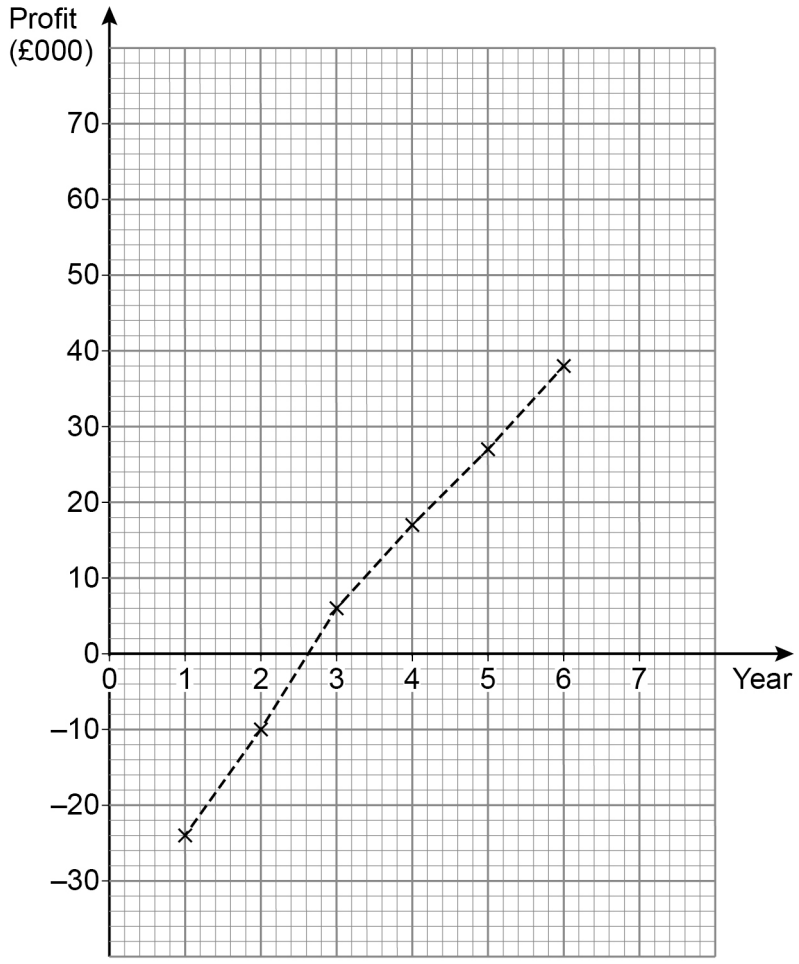
Turn over for the next question

8

Do not write outside the box

2 A business recorded the profit or loss made in each of its first 6 years.

The time series graph shows the data.



2 (a) After how many whole years was the **total** profit greater than the **total** loss?

You **must** show your working.

[2 marks]

Answer _____

2 (b) Use the graph to predict the profit for **year 7**

[1 mark]

Answer £ _____

Do not write outside the box

3 Towns P and Q are 35 km apart.

On a map, the distance PQ is 2 cm

Work out the scale of the map.

Give your answer in the form 1 : n

[2 marks]

Answer 1 : _____

Turn over for the next question

5

Do not write outside the box

4 (a) Work out the nth term of the linear sequence that starts

8 15 22 29 ….

[2 marks]

Answer _____

4 (b) The nth term of a different linear sequence is $2n - 3$

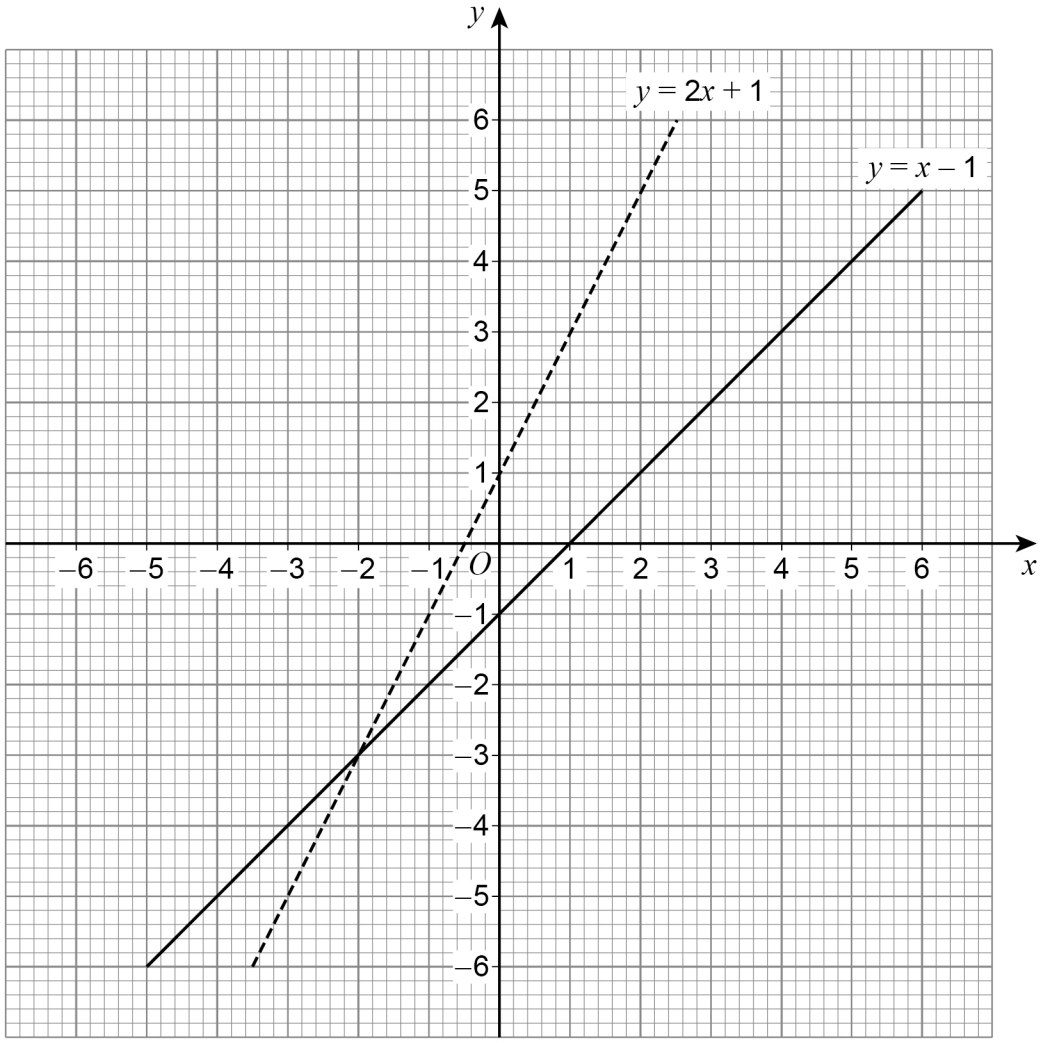
Work out the **position** of the term in this sequence that is the first to be greater than 100

[2 marks]

Answer _____

Do not write outside the box

5 Here are the graphs of $y = 2x + 1$ and $y = x - 1$



Use the graphs to solve the simultaneous equations

$y = 2x + 1$ and $y = x - 1$

[1 mark]

$x =$ _____ $y =$ _____

5

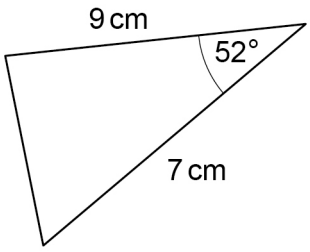
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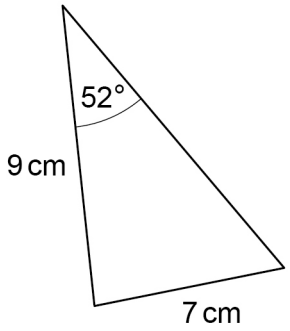
6 Here are four triangles.

Not drawn accurately

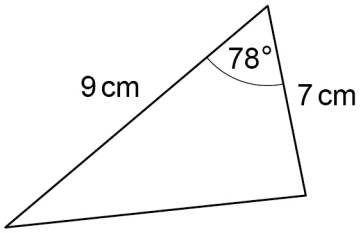
A



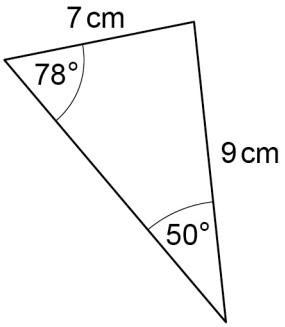
B



C



D



Circle the **two** letters of the triangles that must be congruent.

[1 mark]

A B C D

Do not write outside the box

7 x is an **even** whole number.

$$4 < x - 1 \leqslant 11$$

Work out **all** the possible values of x.

[3 marks]

Answer _____

Turn over for the next question

4

Do not write outside the box

8 All the students at a school are asked which they prefer, Science or English.

	Number of students	**Fraction that prefer Science**
Year 11	225	$\frac{1}{3}$
Other years	975	$\frac{3}{5}$

What **percentage** of the students at the school prefer Science?

[4 marks]

Answer _____ %

Do not write outside the box

9 A track is a circle of diameter 15 metres.

A horse runs at an average speed of 6 metres per second.

Work out the time, in seconds, the horse takes to run around the track.

Give your answer as a decimal.

[3 marks]

Answer _____ seconds

Turn over for the next question

7

Do not write outside the box

10 Kim follows these instructions.

- Choose a positive integer less than 20
- Subtract 10 from it
- Square the result to get your answer

10 (a) Kim says, “My answer is 4”

Lyn says, “You chose the number 12”

Give a reason why Lyn might be wrong.

[1 mark]

10 (b) Lyn follows the same instructions as Kim.

Her answer is 1 less than a prime number.

Work out the **largest** possible number Lyn could have chosen.

[2 marks]

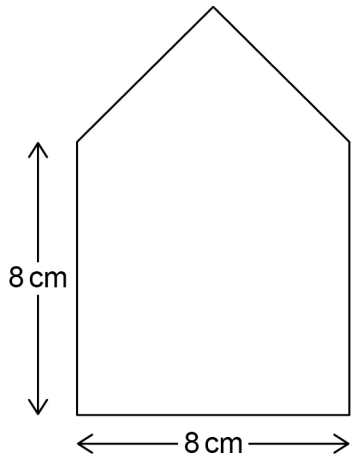
Answer _____

Do not write outside the box

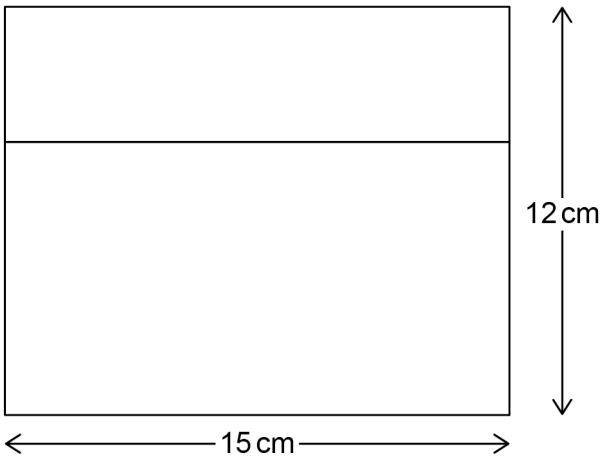
11 The front and side elevations of a toy building are shown.

Not drawn accurately

Front elevation



Side elevation



Work out the **volume** of the toy building.

[4 marks]

Answer _____ cm^3

7

Turn over ►

Do not write outside the box

12 A company has **five** factories that make identical chairs.

12 (a) The company wants to check the strength of the chairs.
They test a sample of chairs made at **one** factory.

Is this a good way to do the check?
Tick a box.

Yes ☐ No ☐

Give a reason for your answer.

[1 mark]

12 (b) The company's target one week was to make, **on average**, at least 14 chairs per worker.
The table shows the number of chairs made at each factory that week.

Factory	Number of chairs made
A	409
B	402
C	1023
D	550
E	576

The company has 209 workers.

Show that, overall, the company achieved its target.

[2 marks]

Do not write outside the box

12 (c) The company wants to make at least 70% profit on the chairs it makes.

Each chair costs £84.90 to make.

The company expects 5% of the chairs to be scrapped due to faults.

Work out the minimum price that the company should charge for each chair.

[4 marks]

Answer £ _____

12 (d) In fact, less than 3% of the chairs have to be scrapped.

What does this mean about the minimum price that the company should charge?

[1 mark]

Tick **one** box.

☐ It is less than the answer to part (c)

☐ It is the same as the answer to part (c)

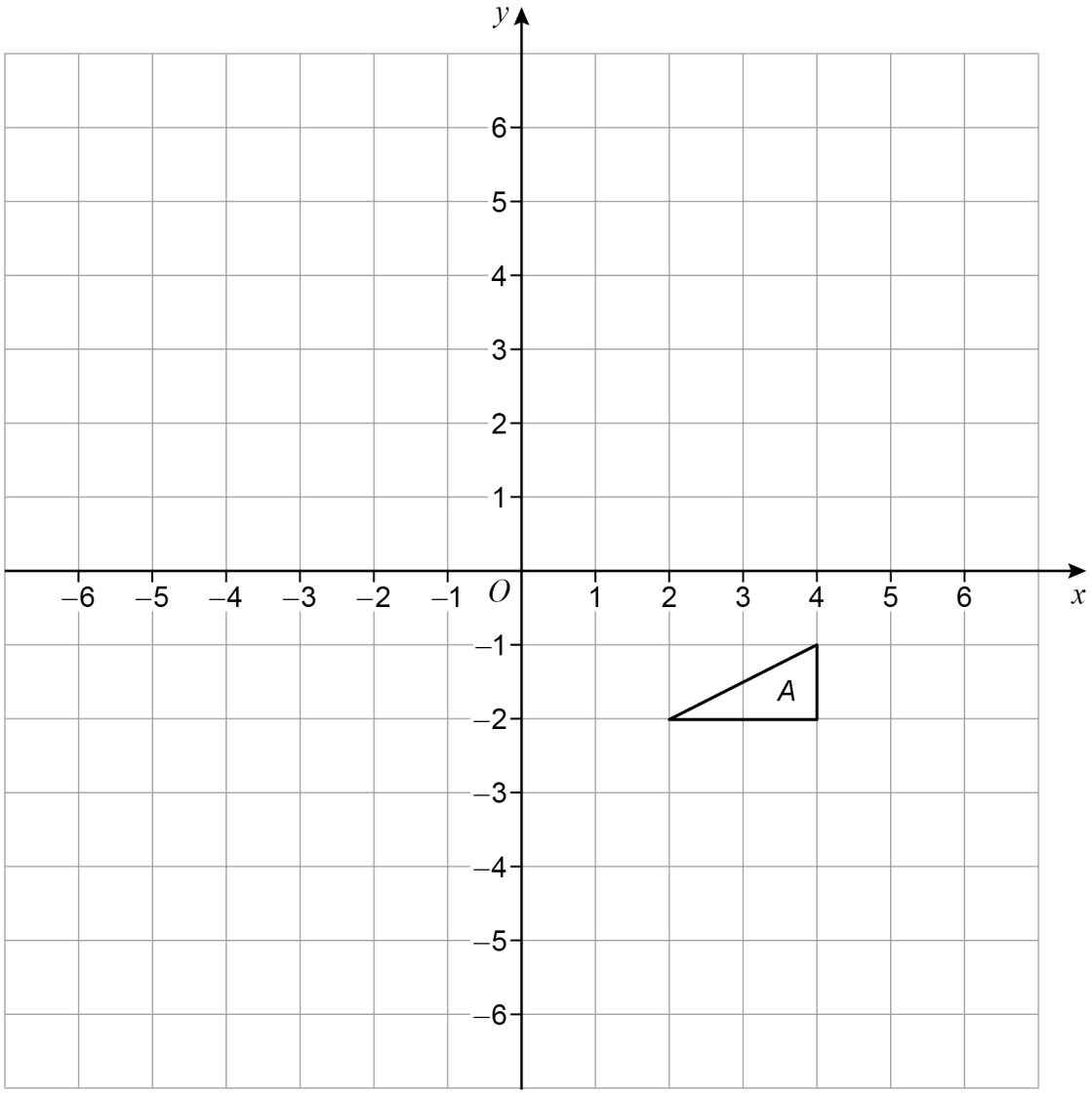
☐ It is more than the answer to part (c)

8

Turn over ►

Do not write outside the box

13



Triangle *A* is moved to triangle *B* by

a rotation 90° **anticlockwise** about O

then

a translation by $\begin{pmatrix} -4 \\ -3 \end{pmatrix}$

Draw triangle *B*.

[2 marks]

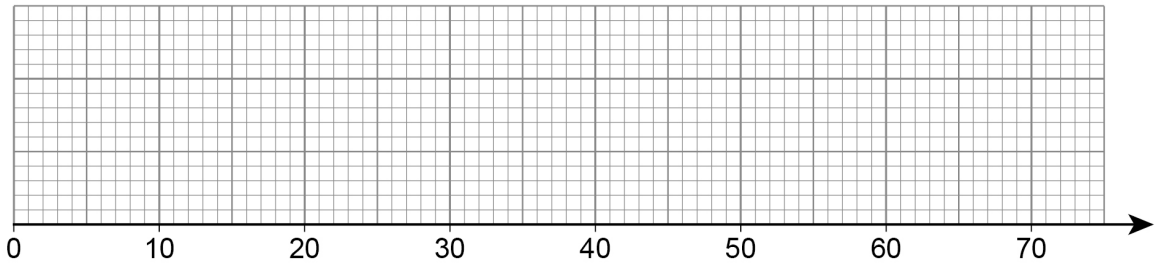
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14 In a set of data,

- the lowest value is 13
- the range is 54
- the upper quartile is 61
- the interquartile range is 42
- median – lower quartile : upper quartile – median = 9 : 5

Draw a box plot to represent the data.

[3 marks]

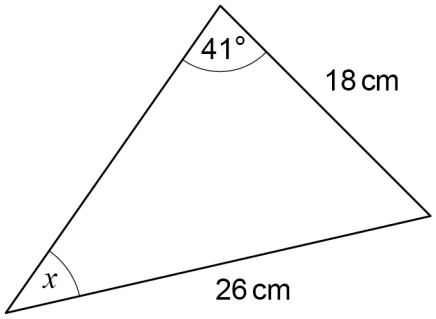


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5

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15



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Use the sine rule to work out the value of x.

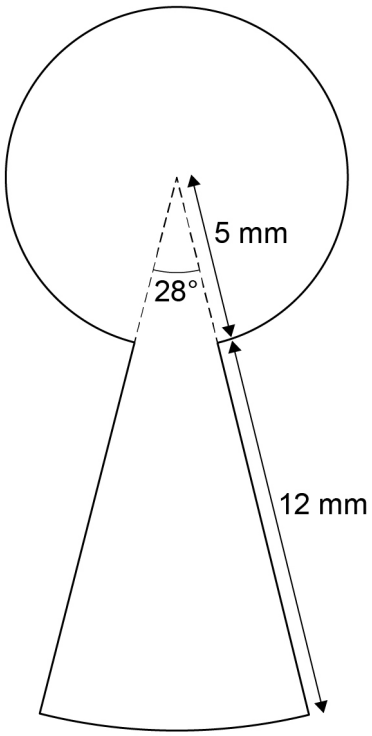
You **must** show your working.

[3 marks]

$x =$ _____ °

Do not write outside the box

16 A shape is made from sectors of two circles.



Not drawn accurately

Work out the area of the shape.

[3 marks]

Answer _____ mm^2

6

Turn over ►

Do not write outside the box

17 $f(x) = 4x - 5$

$g(x) = \dfrac{6 - x}{2}$

17 (a) Work out an expression for $fg(x)$

Give your answer in the form $a + bx$ where a and b are integers.

[2 marks]

$fg(x) =$ _____

17 (b) Work out an expression for $g^{-1}(x)$

[2 marks]

$g^{-1}(x) =$ _____

Do not write outside the box

17 (c) Express $x^2 + 6x - 14$ in the form $(x + a)^2 - b$ where a and b are integers.

[2 marks]

Answer _____

17 (d) Write down the coordinates of the turning point of the curve $y = x^2 + 6x - 14$

[2 marks]

Answer (_____ , _____)

Turn over for the next question

8

Do not write outside the box

18 The first, third and fourth terms of a geometric progression are shown.

$\sqrt{23}$ ……. $23\sqrt{23}$ 529

Work out the second term.

[1 mark]

Answer _____

19

$$\text{pressure} = \frac{\text{force}}{\text{area}}$$

- force = 800 N to 1 significant figure
- area = 1.2 m^2 to 1 decimal place

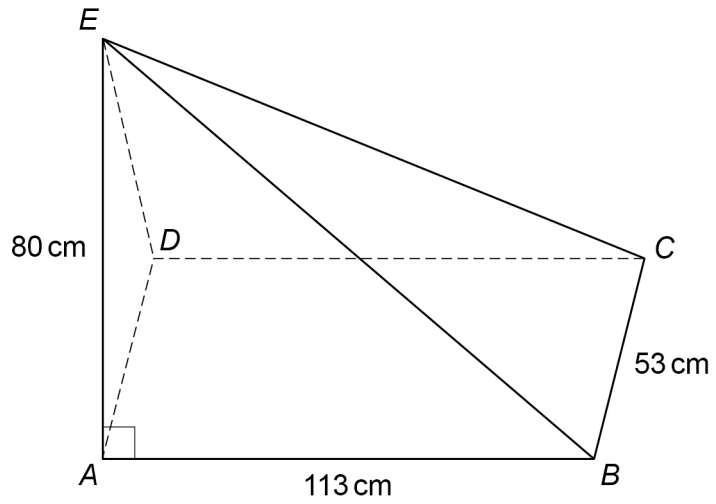
Work out the **upper bound** for pressure.

[3 marks]

Answer _____ N/m^2

Do not write outside the box

20 *ABCDE* is a **rectangular-based** pyramid, where vertex *E* is directly above *A*.



Work out the size of angle *ACE*.

[4 marks]

Answer _____ °

8

Turn over ►

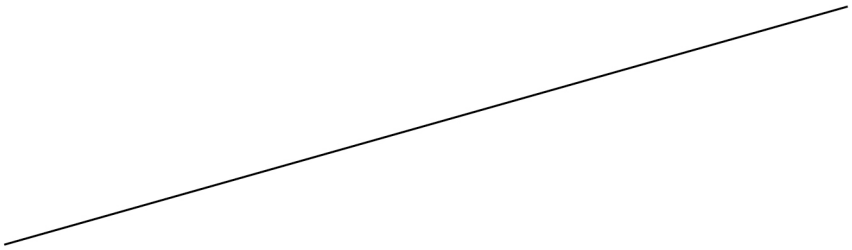
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21 Using ruler and compasses, construct the perpendicular from the point *P* to the line.

You **must** show **all** your construction lines.

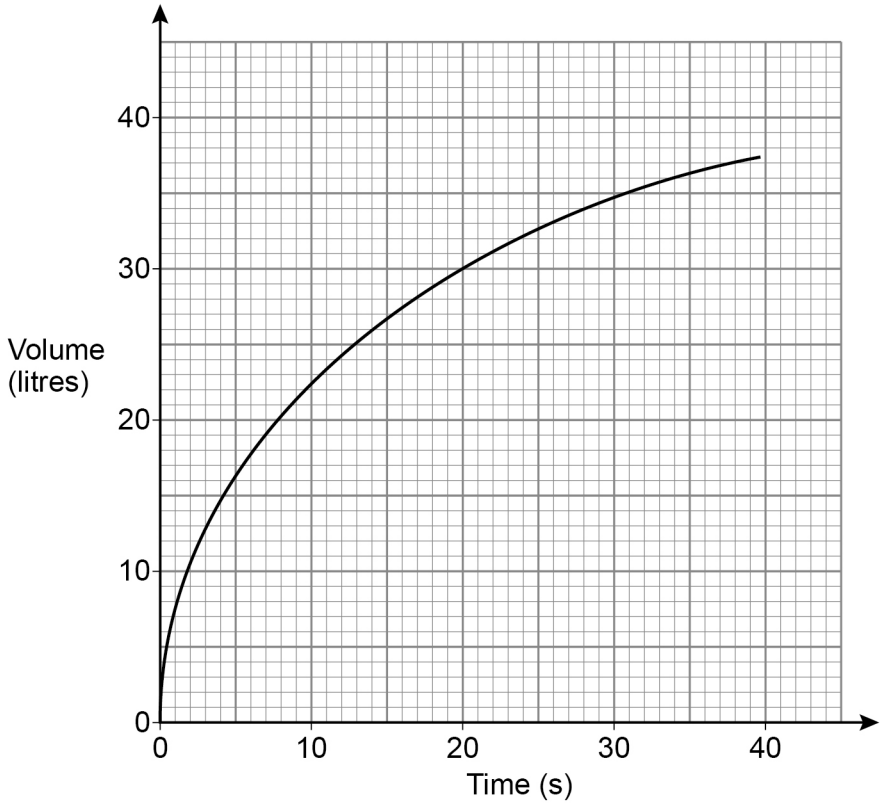
[3 marks]

• *P*



Do not write outside the box

22 The graph shows the volume of liquid in a container as it is filled.



Use the graph to estimate the rate of increase of the volume at 15 seconds.

You **must** show your working.

State the units of your answer.

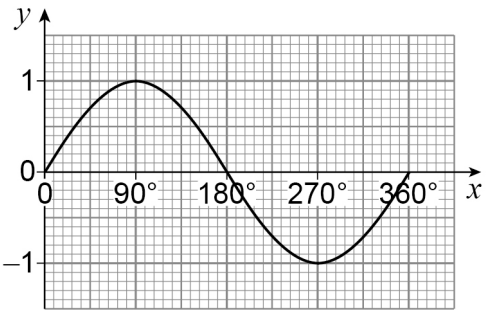
[3 marks]

Answer _____

6

Do not write outside the box

23 Here is the graph of $y = \sin x$ for $0° \leqslant x \leqslant 360°$

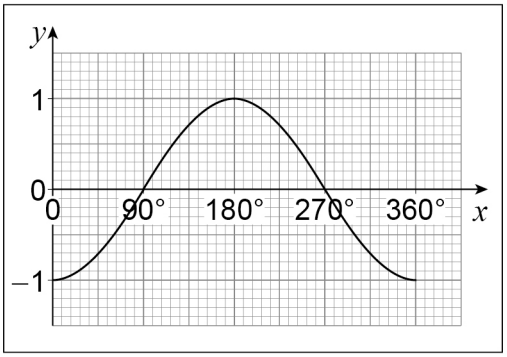


On the next page, match each function to its graph for $0° \leqslant x \leqslant 360°$

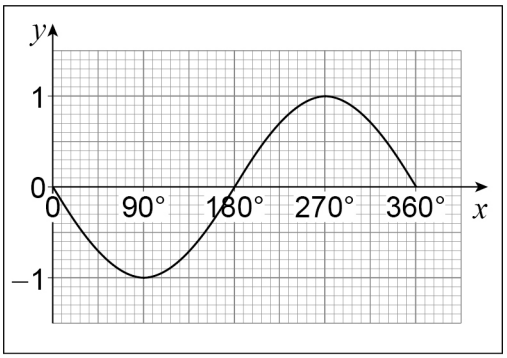
[3 marks]

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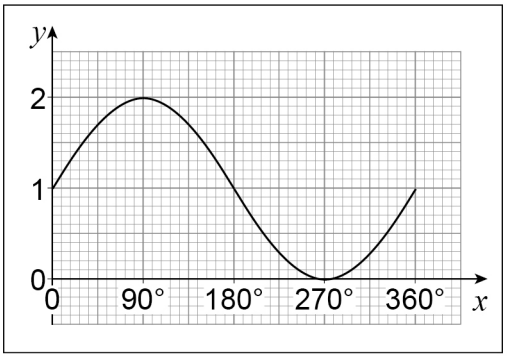
$y = \sin(x + 90)$

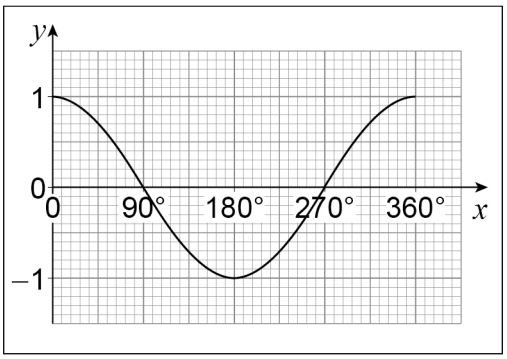


$y = -\sin x$



$y = 1 + \sin x$





END OF QUESTIONS

3

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