

Please write clearly in block capitals.

Centre number

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Candidate number

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Surname

Forename(s)

Candidate signature

I declare this is my own work.

INTERNATIONAL GCSE MATHEMATICS EXTENSION

E

Paper 1E

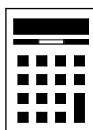
Monday 7 November 2022 07:00 GMT

Time allowed: 2 hours

Materials

For this paper you must have:

- a calculator
- mathematical instruments.



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 100.
- You may ask for more answer paper, graph paper and tracing paper. These must be tagged securely to this answer book.
- If your calculator does not have a π button, take the value of π to be 3.142

Advice

- Show all necessary working; otherwise marks for method may be lost.

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	
28–29	
30–31	
TOTAL	



N 0 V 2 2 9 2 6 0 1 E 0 1

1B/M/Nov22/E8

9260/1E

Answer **all** questions in the spaces provided.**1** C is the set of cube numbers that are less than 100Circle the value of $n(C)$ **[1 mark]**

9

10

3

4

2 (a) Multiply out $x(x^2 + 2)$

Circle your answer.

[1 mark]

$x^3 + 2$

$x^2 + 2x$

$x^3 + 2x$

$2x^3$

2 (b) Simplify $6a^2 + 4a^2 \div 2a$

Circle your answer.

[1 mark]

$6a^2 + 2a$

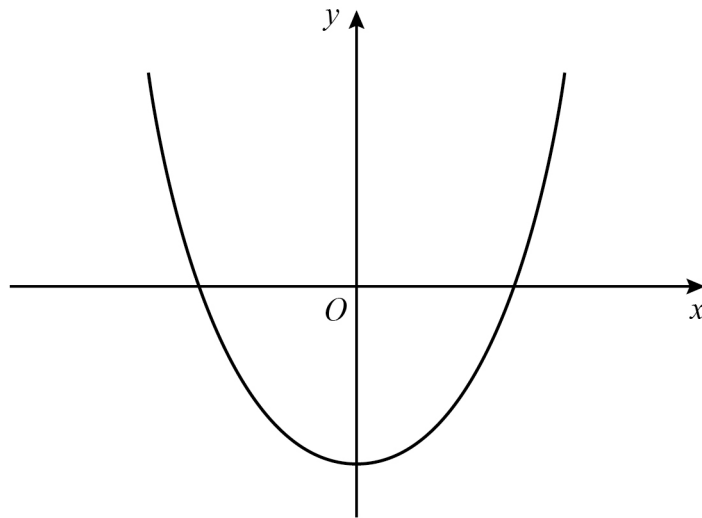
$6a^2 + 2$

$5a$

$5a^3$



- 3 Here is a sketch of a quadratic graph.



Circle the possible equation of the graph.

[1 mark]

$$y = x^2 + 3$$

$$y = x^2 - 3$$

$$y = -3 - x^2$$

$$y = 3 - x^2$$

Turn over for the next question

Turn over ►



- 4** The table shows the areas of three oceans.

Ocean	Area (km ²)
Indian	6.86×10^7
Atlantic	7.80×10^7
Pacific	1.56×10^8

- 4 (a)** Write the area of the Indian Ocean as an ordinary number.

[1 mark]

Answer _____ km²

- 4 (b)** Work out area of Atlantic Ocean : area of Pacific Ocean

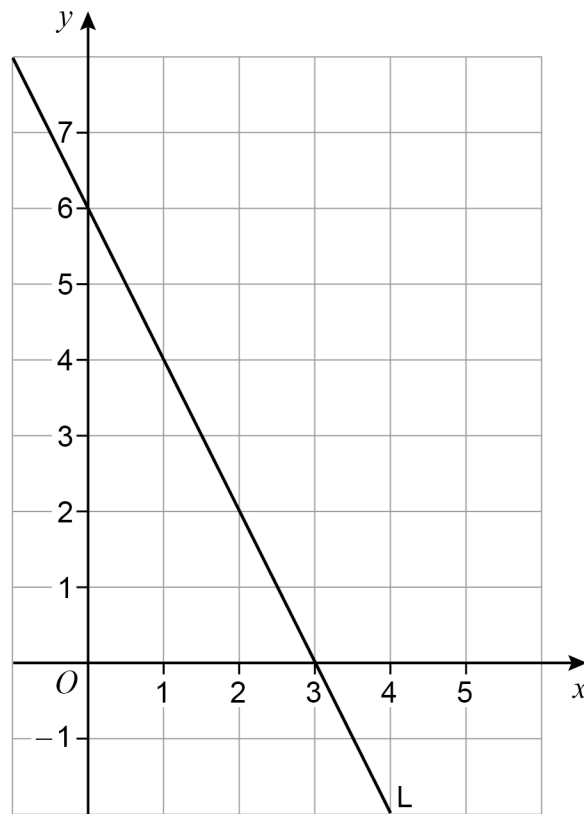
Give your answer in the form $1 : n$

[2 marks]

Answer _____ :



5 L is a straight line.



Work out the equation of line L.

[2 marks]

Answer _____

6 How many cubic centimetres is 4 cubic metres?
Circle your answer.

[1 mark]

400

4000

40 000

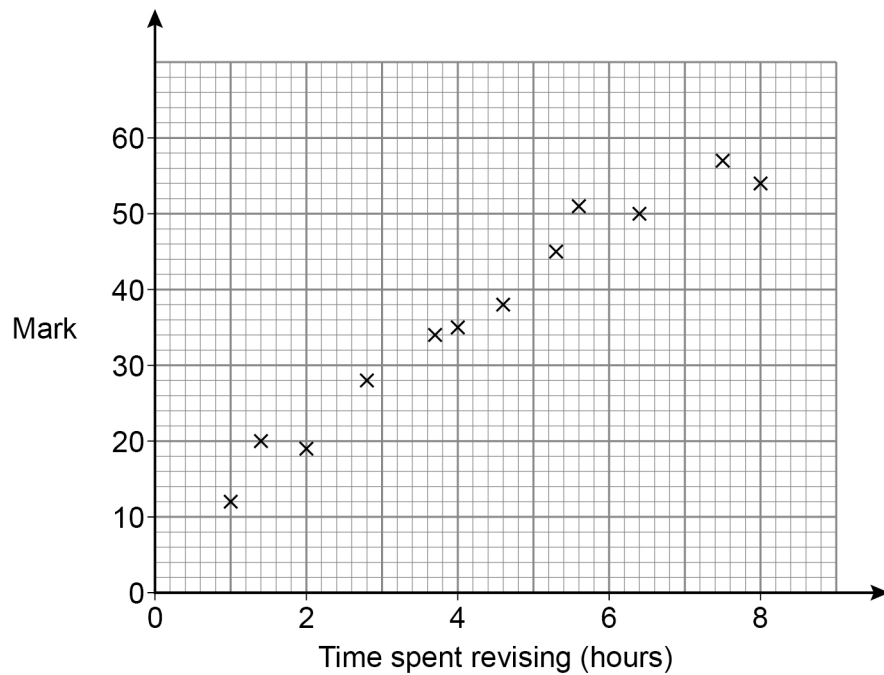
4 000 000



7

Twelve students take an exam.

The scatter diagram shows the time each student spent revising and their mark.



7 (a)

The scatter diagram shows positive correlation.

Describe the relationship between the time spent revising and the mark.

[1 mark]

7 (b)

Another student spent 5 hours revising.

Draw a line of best fit and use it to estimate this student's mark.

[2 marks]

Answer _____



8

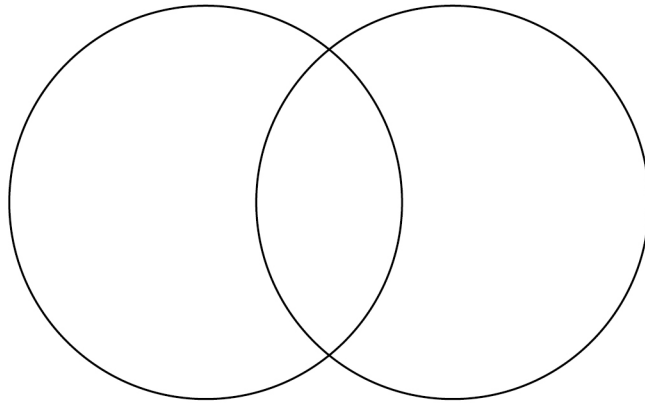
A group of people are visiting a palace and gardens.

85% visit the palace and 35% visit the gardens.

28 people visit both the palace and the gardens.

How many people are in the group?

You may use the diagram to help you.

[3 marks]

Answer _____



9

T is a triangle.

Tick **one** box for each statement about T.

[3 marks]

	Always true	Sometimes true	Never true
Rotation changes its side lengths.	☐	☐	☐
Enlargement changes its angles.	☐	☐	☐
Reflection changes its position.	☐	☐	☐

10

 $(2^4 + \sqrt{0.25}) \div 330$ is equal to the **reciprocal** of a number.

Work out the number.

[2 marks]

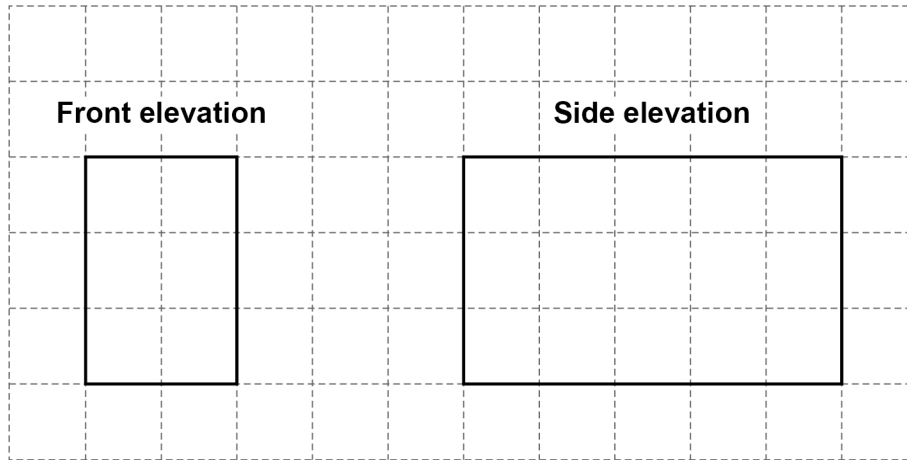
Answer _____



11

The front elevation and side elevation of a cuboid are shown on a centimetre grid.

Do not write
outside the
box



Work out the **total** surface area of the cuboid.

[3 marks]

Answer _____ cm^2

Turn over for the next question

Turn over ►



12 (a) Solve $4(x - 5) > 32$

[2 marks]

Answer _____

12 (b) The integer solutions of an inequality in y are

$-4, -3, -2, -1, 0$ and 1

Complete the inequality by inserting the correct symbol into each space.

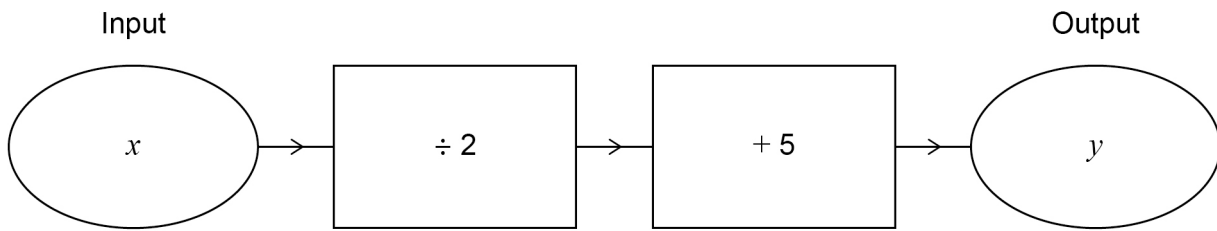
Choose from $<$, $\leq$, $>$ and $\geq$

[1 mark]

-12 _____ $3y$ _____ 3



- 13** Here is a number machine.



Work out x in terms of y .

[2 marks]

$$x = \underline{\hspace{10cm}}$$

- 14** Six whole numbers have
a mean of 34
and
a median of 35

Four of the numbers are 27, 28, 34 and 40

Work out the other two numbers.

[3 marks]

Answer _____ and _____

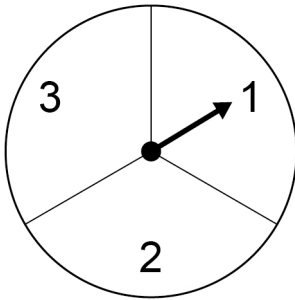
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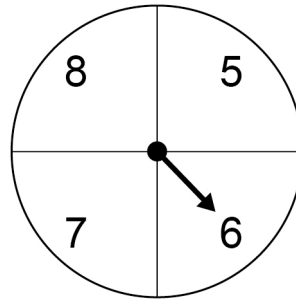
15

Two fair spinners, A and B, are spun.

Spinner A



Spinner B



Here are two events.

X The sum of the two numbers is 7

Y The sum of the two numbers is 8

Which is **less** likely, X or Y?You **must** show your working.**[2 marks]**

Answer _____

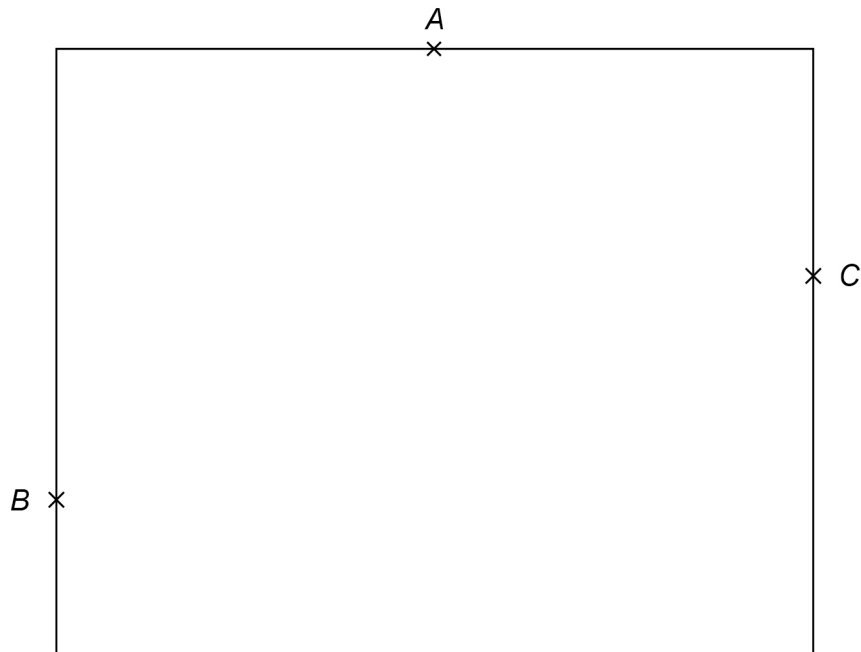


16

Use a ruler and compasses in this question.

Here is a scale drawing of a conference room.

Scale: 2 centimetres represents 5 metres



Shade the region that is

less than 8 metres from point *A*

and

nearer to point *B* than to point *C*.

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

[4 marks]



17

Solve these simultaneous equations.

$$y = 3x - 1.5$$

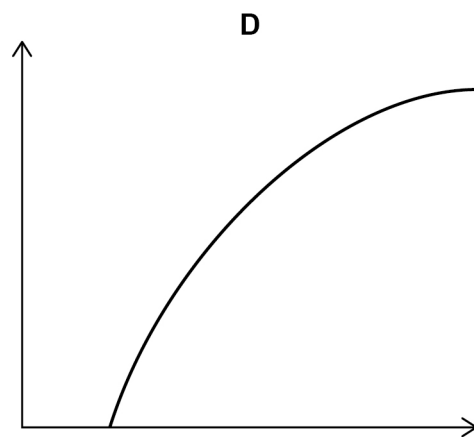
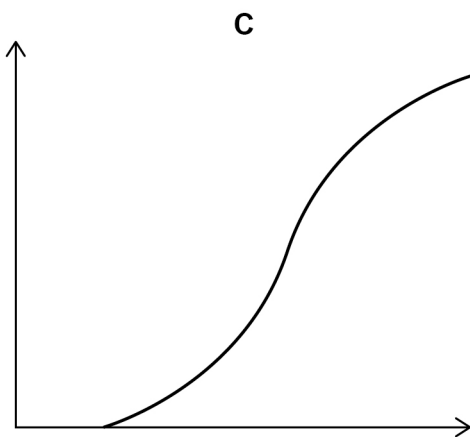
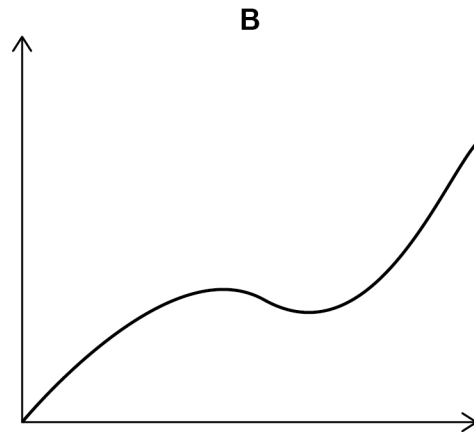
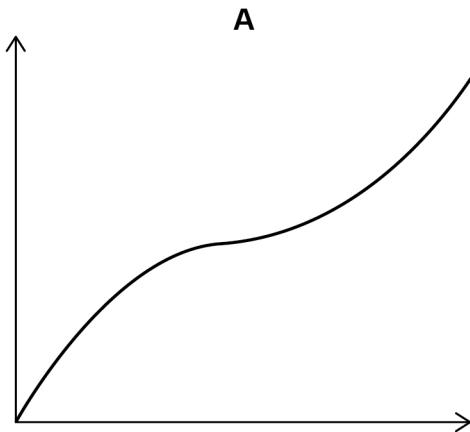
$$2x + 2y = 17$$

[4 marks]

 $x =$ _____ $y =$ _____

18

Here are four graphs.



Write the letter of the graph that **cannot** be a cumulative frequency diagram.

Give a reason for your answer.

[2 marks]

Graph _____

Reason _____

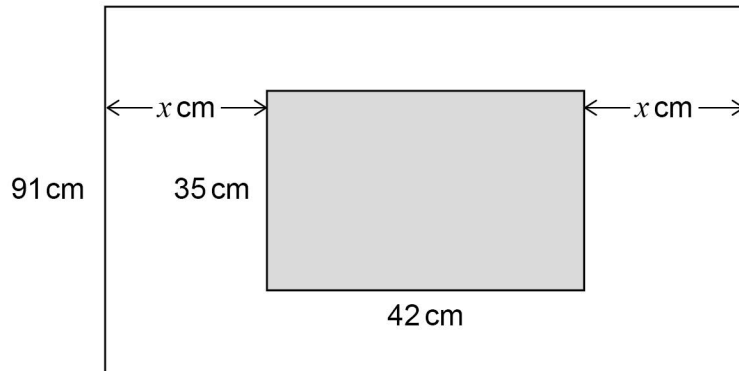


19

The shorter sides of a rectangular wall are each 91 cm

A rectangular mirror is 42 cm by 35 cm

The mirror is placed on the wall as shown.



Not drawn
accurately

The rectangles are similar shapes.

Work out the value of x .

[4 marks]

Answer _____



- 20** Which of these is a unit of acceleration?
Circle your answer.

[1 mark]

m^2/s

m/s^2

s^2/m

s/m^2

- 21 (a)** Circle the calculation that simplifies to 10^{200}

[1 mark]

2×5^{100}

2×5^{200}

$2^{100} \times 5^{100}$

$2^{200} \times 5^{200}$

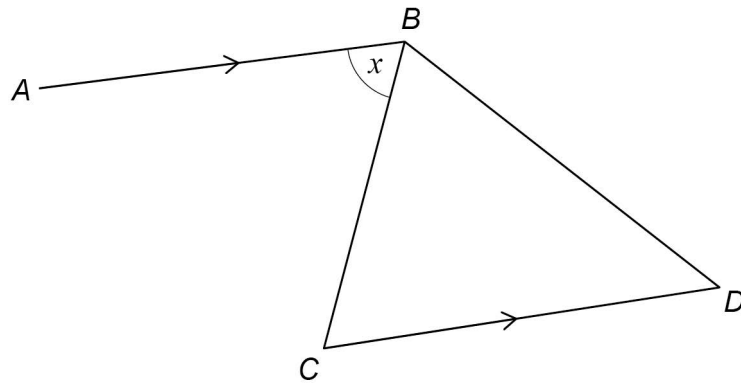
- 21 (b)** Simplify $\sqrt{11^{400} \div 11^{100}}$
Give your answer as a power of 11

[2 marks]

Answer _____



22

 AB is parallel to CD . $BD = CD$ Do not write
outside the
boxNot drawn
accuratelyProve that BC bisects angle ABD .**[3 marks]**



- 23** Show that $\sqrt{50} + 4\sqrt{18}$ can be written in the form $a\sqrt{2}$
You **must** show your working. **[3 marks]**

- 24** A **regular** polygon has n sides.
size of the interior angle : size of the exterior angle = 8 : 1
Work out the value of n . **[3 marks]**

Answer _____



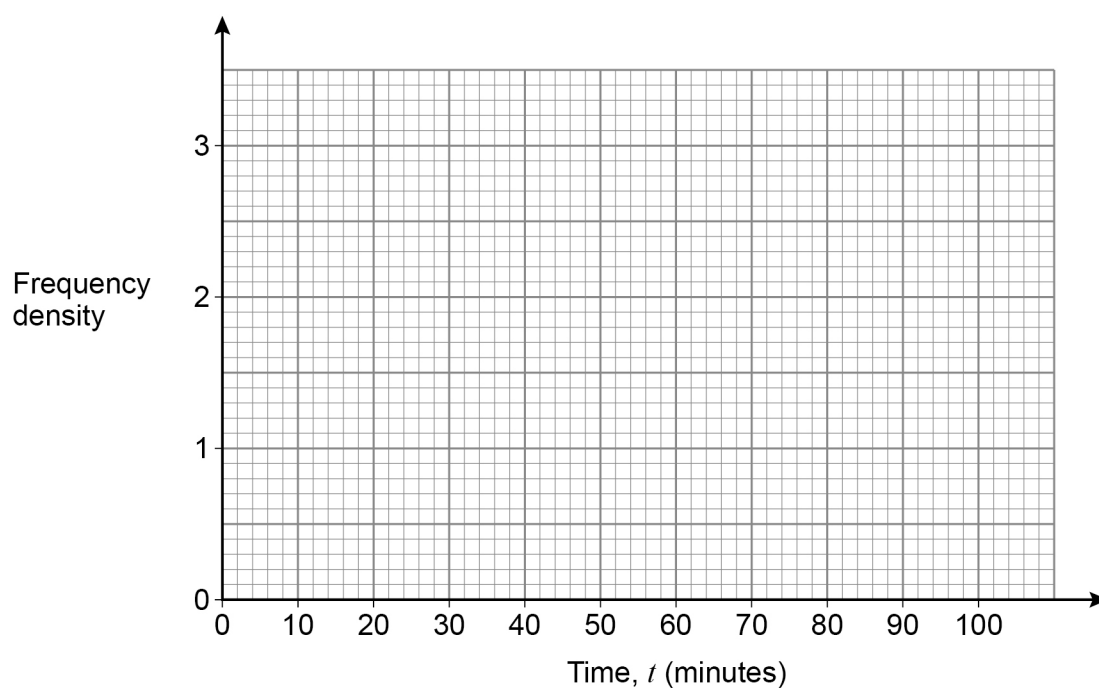
25

The table shows information about the time 80 people spent in a park one day.

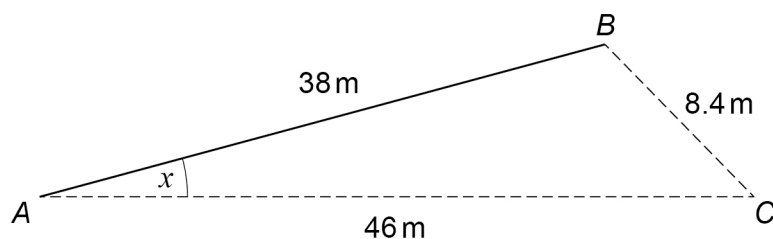
Time, t (minutes)	Frequency
$0 < t \leq 15$	6
$15 < t \leq 30$	18
$30 < t \leq 40$	26
$40 < t \leq 60$	18
$60 < t \leq 100$	12

Draw a histogram to represent the data.

[3 marks]



26

 AB represents a wheelchair ramp.Not drawn
accurately

For the ramp to be safe, angle x should be **less** than 4.8°

Is the ramp safe?

You **must** show your working.

[3 marks]

Turn over for the next question

Turn over ►



27

The term-to-term rule of a sequence is

multiply by 2
then
add 4

The first term of the sequence is x .

The **third** term of the sequence is equal to x^2

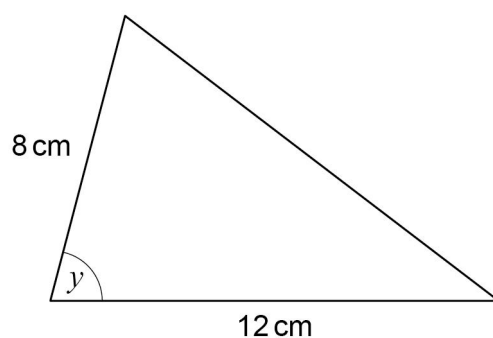
Work out the **two** possible values of x .

[5 marks]

Answer _____ and _____



28

The area of this acute-angled triangle is 38.4 cm^2 Not drawn
accuratelyWork out the size of angle y .**[3 marks]**

 $y =$ _____ °

Turn over for the next question

Turn over ►



29

$$0.\dot{3}\dot{5} = \frac{35}{99}$$

Convert $0.6\dot{3}\dot{5}$ to a fraction.

You **must** show your working.

[2 marks]

Answer _____



30

The equation of a curve is $y = 4x^3 - 10x$

Work out the **two** values of x at which the gradient of the curve is 17

[3 marks]

Answer _____ and _____

Turn over for the next question



31 (a) $f(x) = 7 - 4x$ with domain $-2 \leq x \leq 5$

Work out the range of $f(x)$

Give your answer as a single inequality.

[2 marks]

Answer _____

31 (b) $g(x) = \frac{3x - 7}{2}$

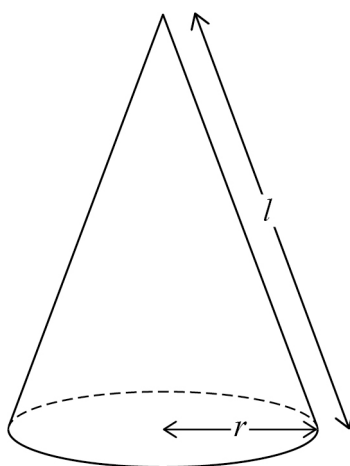
Work out $g^{-1}(x)$

[3 marks]

Answer _____



A cone has radius r and slant height l .



Total surface area of a cone = $\pi r(r + l)$

The total surface area of the cone is **exactly** $152\pi \text{ cm}^2$

The radius of the cone is 4.5 cm to the nearest 0.5 cm

Work out the lower bound of l .

You **must** show your working.

[4 marks]

[illegible]

Answer _____ cm



n is an integer.

[3 marks]

[illegible]

A parallelogram is shown with a diagonal vector m starting from the bottom-left vertex. The left side of the parallelogram is labeled $2a$ with an arrow pointing upwards. The top side is labeled $3b$ with an arrow pointing to the right.

Not drawn
accurately

Circle the expression for **m**.

[1 mark]

$$-2\mathbf{a} + 3\mathbf{b}$$


35

$\frac{a}{b}$ and $\frac{b}{c}$ are two **proper** fractions.

Each fraction is in its simplest form.

The lowest common denominator of the two fractions is 35

The sum of $\frac{a}{b}$ and $\frac{b}{c}$ is also a **proper** fraction.

Work out the value of $\frac{a}{b} + \frac{b}{c}$

[2 marks]

Answer _____

Turn over for the next question



36

By completing the square, solve $2x^2 - 20x + c = 0$

Give your answers in surd form **in terms of c** .

You **must** show your working.

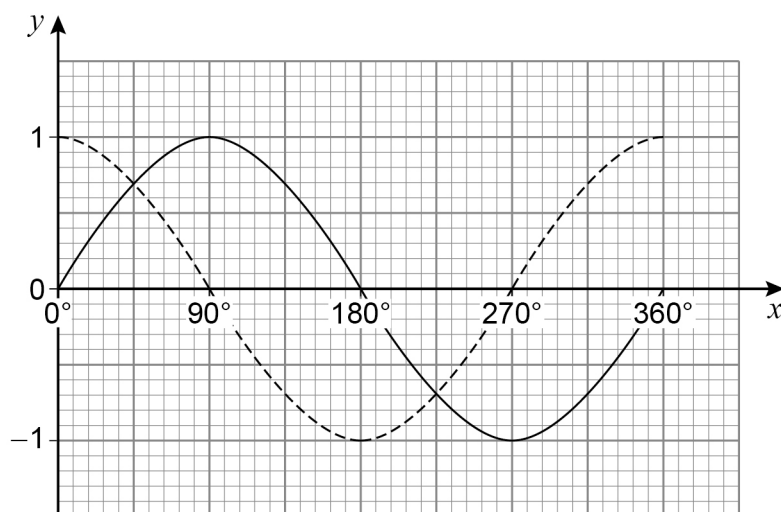
[3 marks]

Answer _____



37

Here are the graphs of $y = \sin x$ and $y = \cos x$ for values of x from 0° to 360°



Use the graphs to solve $\sin x = \cos x$ for values of x from 0° to 360°

[2 marks]

Answer _____

END OF QUESTIONS



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[illegible]

[illegible]

[illegible]

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