Cambridge Assessment International Education

Cambridge IGCSE™

CANDIDATE NAME									
CENTRE NUMBER						CANDIDATE NUMBER				

7431272033

CAMBRIDGE INTERNATIONAL MATHEMATICS **0607/33**

Paper 3 (Core) **May/June 2024**

1 hour 45 minutes

You must answer on the question paper.

You will need: Geometrical instruments

INSTRUCTIONS

- Answer **all** questions.
- Use a black or dark blue pen. You may use an HB pencil for any diagrams or graphs.
- Write your name, centre number and candidate number in the boxes at the top of the page.
- Write your answer to each question in the space provided.
- Do **not** use an erasable pen or correction fluid.
- Do **not** write on any bar codes.
- You should use a graphic display calculator where appropriate.
- You may use tracing paper.
- You must show all necessary working clearly and you will be given marks for correct methods, including sketches, even if your answer is incorrect.
- Give non-exact numerical answers correct to 3 significant figures, or 1 decimal place for angles in degrees, unless a different level of accuracy is specified in the question.
- For π, use your calculator value.

INFORMATION

- The total mark for this paper is 96.
- The number of marks for each question or part question is shown in brackets [ ].

This document has **20** pages. Any blank pages are indicated.

Formula List

Area, A, of triangle, base b, height h.	$A = \frac{1}{2}bh$
Area, A, of circle, radius r.	$A = \pi r^2$
Circumference, C, of circle, radius r.	$C = 2\pi r$
Curved surface area, A, of cylinder of radius r, height h.	$A = 2\pi rh$
Curved surface area, A, of cone of radius r, sloping edge l.	$A = \pi rl$
Curved surface area, A, of sphere of radius r.	$A = 4\pi r^2$
Volume, V, of prism, cross-sectional area A, length l.	$V = Al$
Volume, V, of pyramid, base area A, height h.	$V = \frac{1}{3}Ah$
Volume, V, of cylinder of radius r, height h.	$V = \pi r^2 h$
Volume, V, of cone of radius r, height h.	$V = \frac{1}{3}\pi r^2 h$
Volume, V, of sphere of radius r.	$V = \frac{4}{3}\pi r^3$

Answer **all** the questions.

1 **(a)** Write the number 27 964 in words.

.....

..... [1]

(b) Write 27 964

(i) correct to the nearest thousand

..... [1]

(ii) correct to 1 significant figure.

..... [1]

(c) Write down

(i) a multiple of 15

..... [1]

(ii) a factor of 12.

..... [1]

(d) Find the value of

(i) $\sqrt{81}$

..... [1]

(ii) 7^3.

..... [1]

2 These are the numbers of days each student in a class was absent during one month.

X	5	2	2	X	3	X	Ø
2	4	3	7	2	X	Ø	7

(a) Complete the frequency table.
The frequencies for 0 and 1 days have been completed for you.

Number of days absent	0	1	2	3	4	5	6	7
Frequency	2	4						

[2]

(b) Find how many students are in the class.

..... [1]

(c) Find how many **more** students were absent for 1 day than for 7 days.

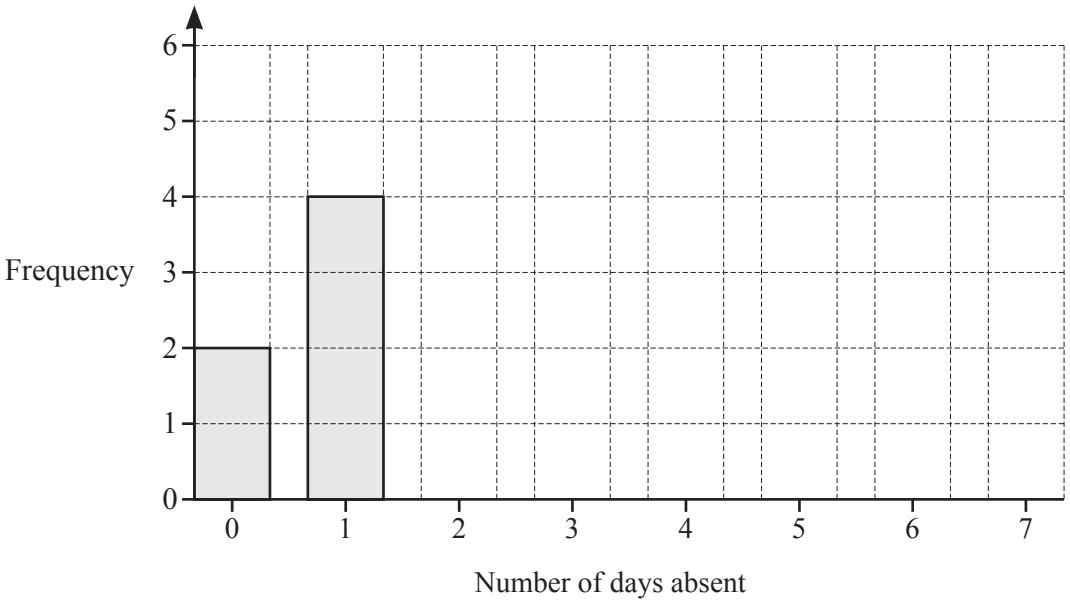
..... [1]

(d) One of these students is chosen at random.

Find the probability that this student was absent for 0 days.

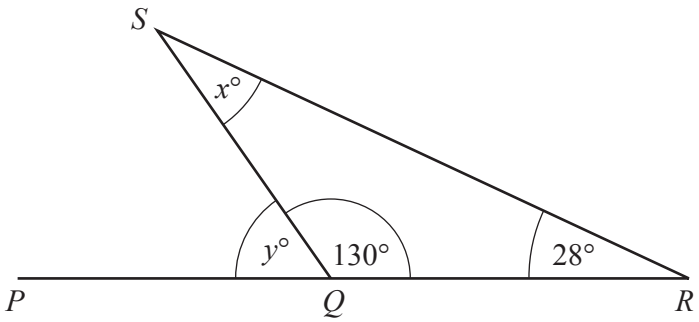
..... [1]

(e) Complete the bar chart to show the information in the table.



[2]

3 (a)



NOT TO SCALE

In the diagram, PQR is a straight line.

(i) Write down the mathematical name for an angle of 130°.

..... [1]

(ii) Work out the value of x and the value of y.
Give a geometrical reason for each answer.

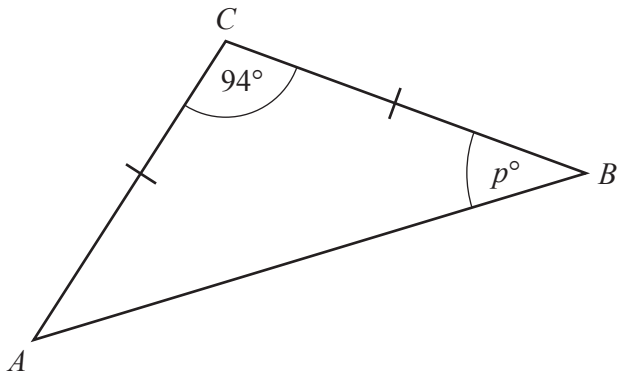
$x =$ ..... because .....

.....

$y =$ ..... because .....

..... [4]

(b)



NOT TO SCALE

(i) Write down the mathematical name for triangle ABC.

..... [1]

(ii) Work out the value of p.

$p =$ ..... [2]

4 **(a)** Write 0.40 as a percentage.

..... % [1]

(b) Write $\frac{7}{8}$ as a decimal.

..... [1]

(c) Write $\frac{11}{20}$ as a percentage.

..... % [1]

(d) Write 12% as a fraction in its simplest form.

..... [2]

(e) Work out 6% of 2500.

..... [1]

(f) Work out.

$$\frac{3}{5} \times \frac{3}{4}$$

Give your answer as a fraction.

..... [1]

5 **(a)** These are the first four terms of a sequence.

19 15 11 7

(i) Work out the next three terms.

.... [2]

(ii) Write down the rule for continuing this sequence.

..... [1]

(b) This is the rule for continuing a different sequence.

Add 6 to the previous term.

The 5th term of this sequence is 31.

Find the 1st term of this sequence.

..... [2]

(c) The nth term of another sequence is $n^2 + 4$.

Find the first three terms of this sequence.

.... [2]

(d) These are the first four terms of a different sequence.

19 21 23 25

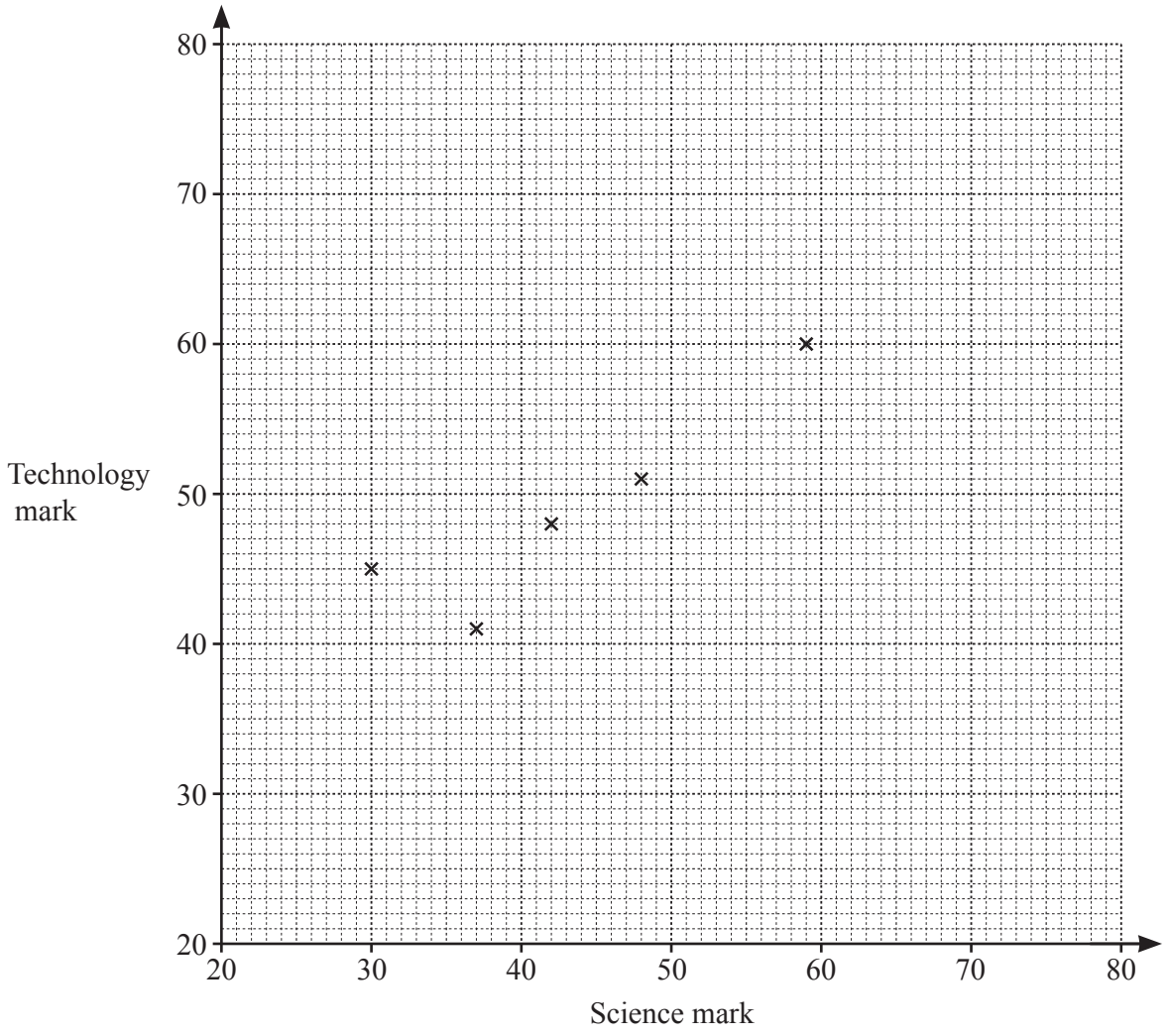
Find an expression for the nth term.

..... [2]

6 The table shows the marks obtained by each of 10 students in a science exam and in a technology exam.

Science mark	30	48	59	37	42	56	53	47	63	25
Technology mark	45	51	60	41	48	66	56	56	67	40

(a) Complete the scatter diagram.
The first five points have been plotted for you.



[2]

(b) What type of correlation is shown in the scatter diagram?

..... [1]

(c) **(i)** Work out the mean science mark and the mean technology mark.

Mean science mark = ...

Mean technology mark = ... [2]

(ii) On the scatter diagram, draw a line of best fit. [2]

(d) Toby scored 35 marks in the science exam but missed the technology exam.

Use your line of best fit to estimate a mark for Toby in the technology exam.

..... [1]

7 **(a)** Solve.

(i) $\frac{x}{3} = 9$

$x =$ ..... [1]

(ii) $5x - 4 = 11$

$x =$ ..... [2]

(b) Expand.

$4(x + 3)$

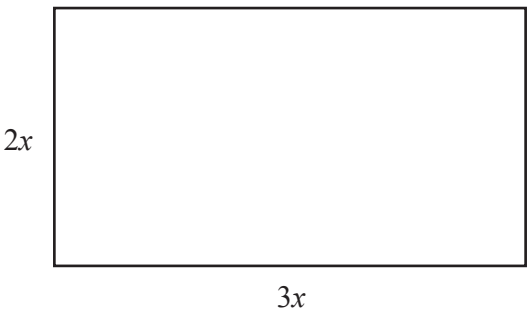
..... [1]

(c) Factorise.

$y^2 - 2y$

..... [1]

(d)



NOT TO SCALE

The diagram shows a rectangle.
All lengths are in centimetres.

(i) Find an expression, in terms of x, for the area of the rectangle.
Give your answer in its simplest form.

..... cm^2 [1]

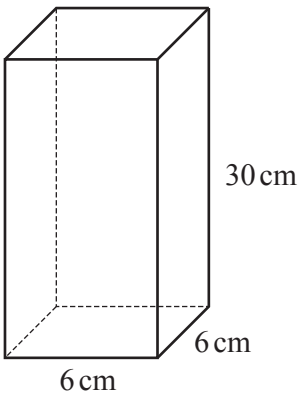
(ii) The area of the rectangle is 54 cm^2.

Write down an equation in terms of x and solve it to find the length and the width of the rectangle.
Show all your working.

Length = ... cm

Width = ... cm [4]

8 (a)



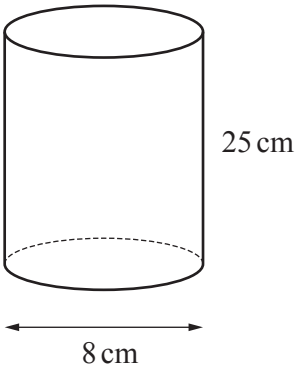
NOT TO SCALE

The diagram shows a solid cuboid.

Find the total surface area of the cuboid.
Give the units of your answer.

.... [4]

(b)



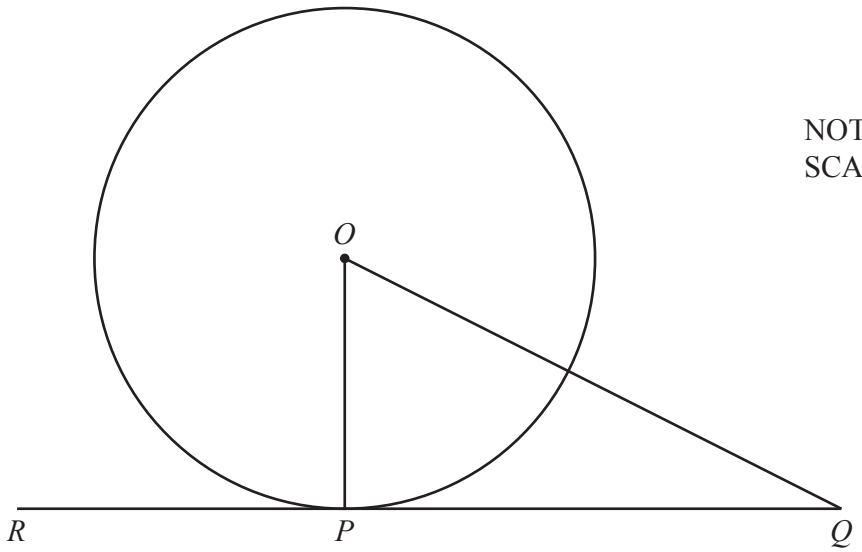
NOT TO SCALE

The diagram shows a cylinder of height 25 cm and diameter 8 cm.

Find the volume of the cylinder.

..... cm^3 [2]

(c)



(i) The straight line RPQ touches the circle, centre O, at P.

Complete this statement.

Angle $OPQ = 90°$ because .....

..... [1]

(ii) $PQ = 7\,\text{cm}$ and $OP = 4\,\text{cm}$.

(a) Work out OQ.

$OQ =$ ..... cm [2]

(b) Work out angle OQP.

Angle $OQP =$ ..... [2]

9 The table shows the population and land area of Denmark and of Sweden.

	Denmark	Sweden
Population	5.8×10^6	1.1×10^7
Land area (km^2)	4.2×10^4	4.5×10^5

(a) Write the population of Denmark as an ordinary number.

..... [1]

(b) Work out the total land area of Denmark and Sweden.
Give your answer in standard form.

..... km^2 [2]

(c) Work out how much greater the population of Sweden is than the population of Denmark.

..... [1]

(d) $$\text{Population density} = \frac{\text{Population}}{\text{Land area}}$$

Work out the population density of Denmark.
Give your answer correct to the nearest integer.

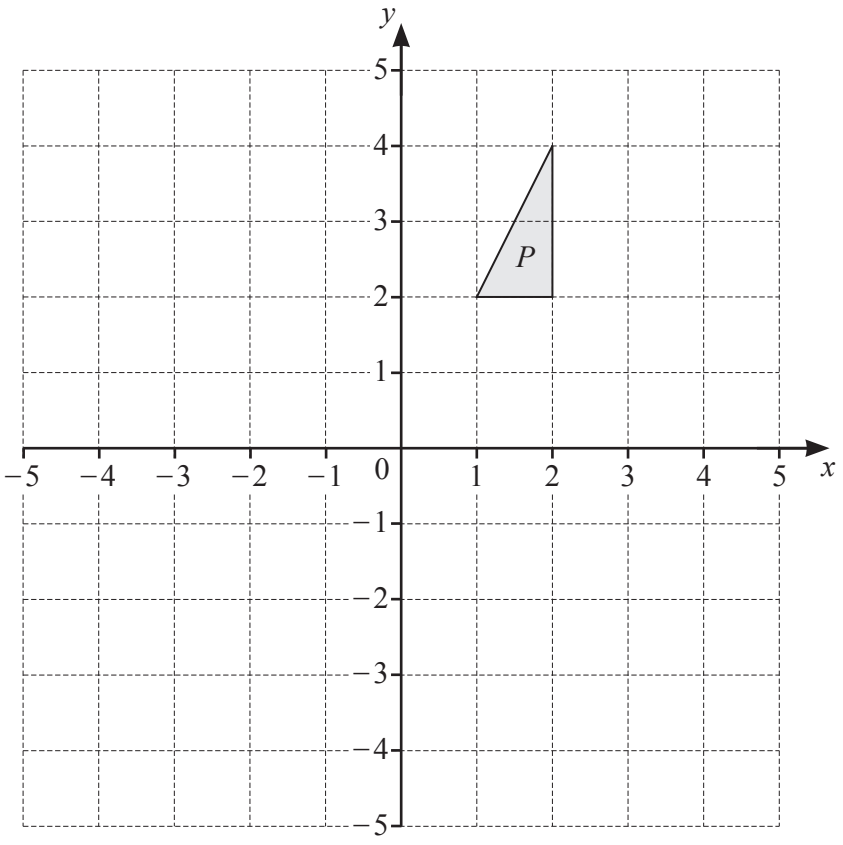
..... people/km^2 [2]

(e) The population of Denmark is 0.53 times the population of Sweden.

Write 0.53 in standard form.

..... [1]

10



(a) (i) Reflect triangle P in the x-axis.
Label the image X. [1]

(ii) Reflect triangle P in the y-axis.
Label the image Y. [1]

(iii) Describe fully the **single** transformation which maps triangle Y onto triangle X.

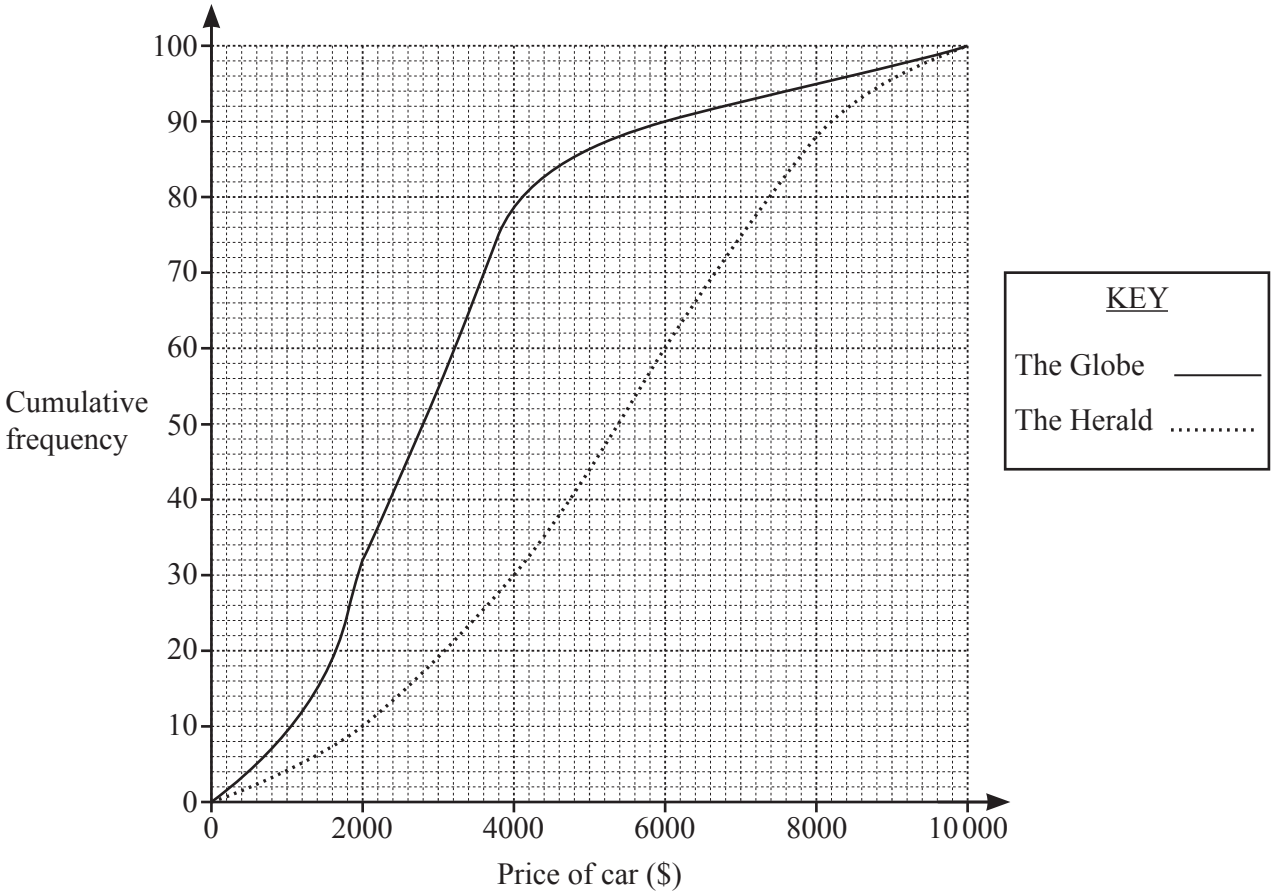
.....

..... [3]

(b) Translate triangle P by $\begin{pmatrix} 2 \\ -4 \end{pmatrix}$.

Label the image Z. [2]

11 Ali collects the prices, in $, of cars advertised in two newspapers, The Globe and The Herald. The cumulative frequency curves show the data he collected.



(a) Work out how many more cars costing $6000 were advertised in The Globe than in The Herald.

..... [2]

(b) Work out how many cars advertised in The Herald cost at least $8000.

..... [2]

(c) For cars advertised in The Globe, find

(i) the median price

$ ..... [1]

(ii) the interquartile range.

$ ..... [2]

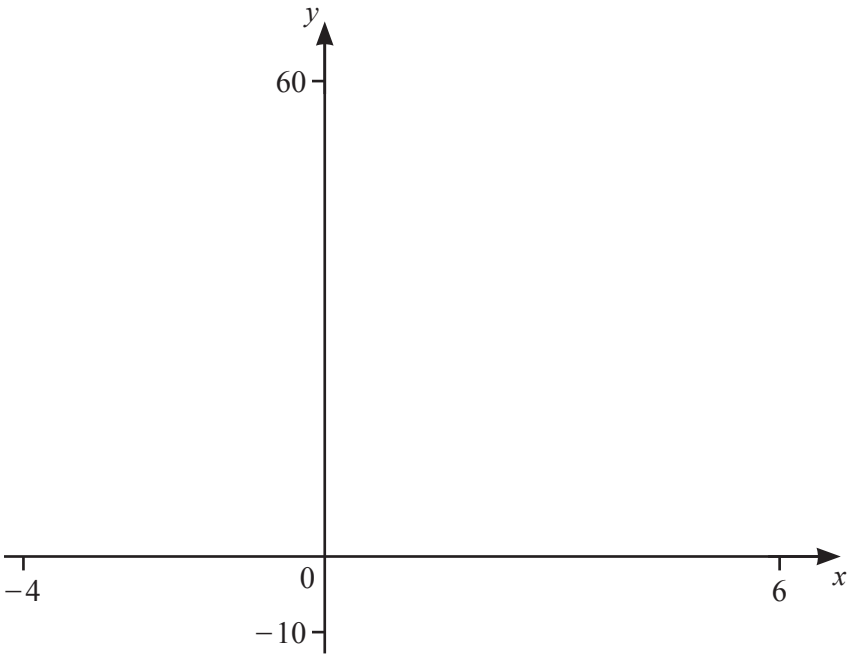
(d) Ali has $2000 to buy a car.

Is The Globe or The Herald more useful to help Ali find a car?
Give a reason for your choice.

..... because .....

..... [1]

12



(a) **(i)** On the diagram, sketch the graph of $y = 2x^2 - 6x$ for $-4 \leqslant x \leqslant 6$. [2]

(ii) Find the x-coordinate of the local minimum.

$x =$ ..... [1]

(b) On the diagram, sketch the graph of $y = x^2 - 4x + 15$ for $-4 \leqslant x \leqslant 6$. [2]

(c) Find the x-coordinate of each point of intersection of $y = 2x^2 - 6x$ and $y = x^2 - 4x + 15$.

$x =$ ..... and $x =$ ..... [2]

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