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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 27964 in words.

.....
..... [1]

- (b) Write 27964

- (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.

χ 5 2 2 χ 3 χ \emptyset
 2 4 3 7 2 χ \emptyset 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.

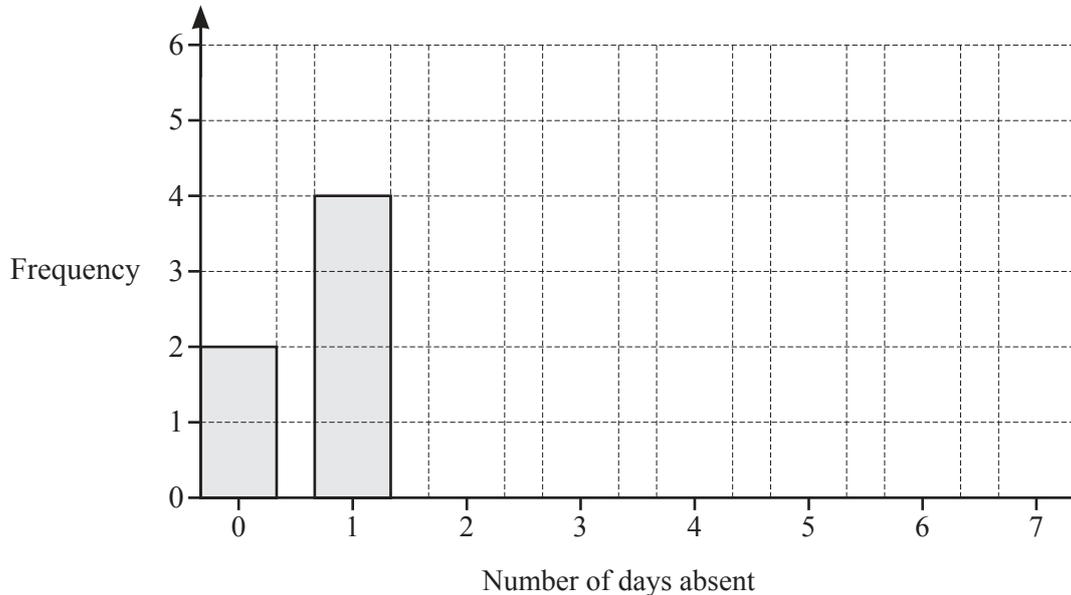
..... [1]

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

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

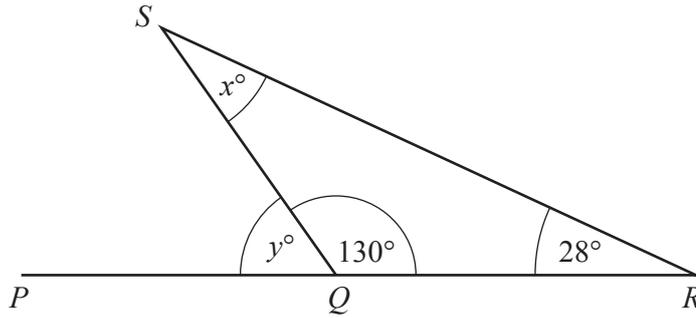
..... [1]

- (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.

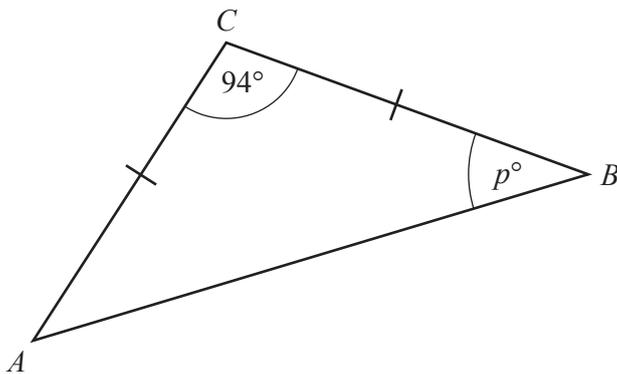
$x =$ because

.....

$y =$ 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 n th 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

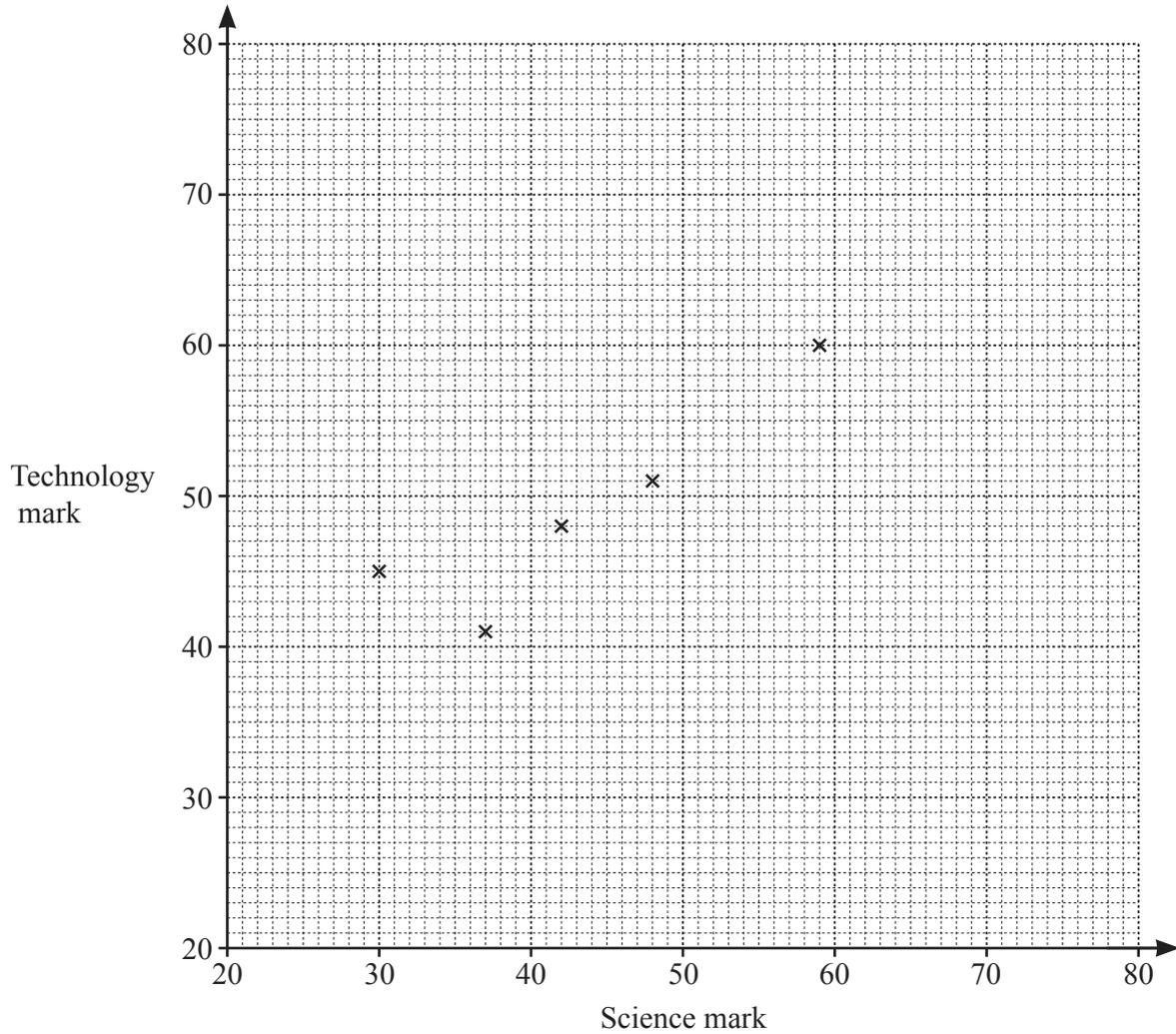
Find an expression for the n th term.

..... [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) $\frac{x}{3} = 9$

$x = \dots\dots\dots$ [1]

(ii) $5x - 4 = 11$

$x = \dots\dots\dots$ [2]

(b) Expand.

$4(x + 3)$

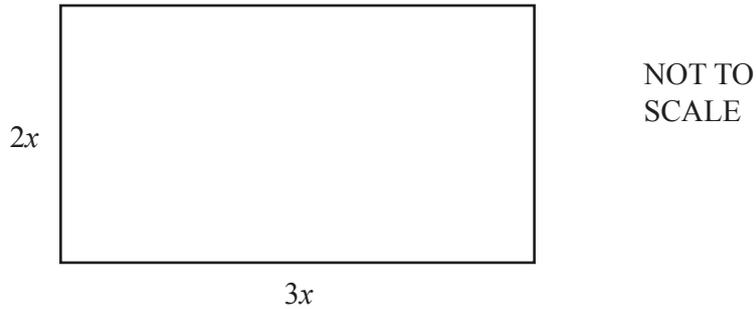
$\dots\dots\dots$ [1]

(c) Factorise.

$y^2 - 2y$

$\dots\dots\dots$ [1]

(d)



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]

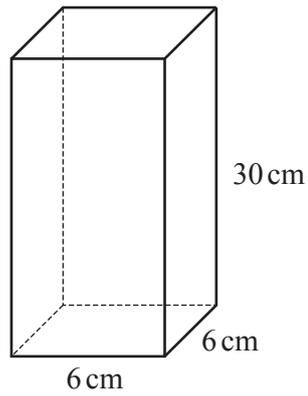
- (ii) The area of the rectangle is 54 cm^2 .

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)



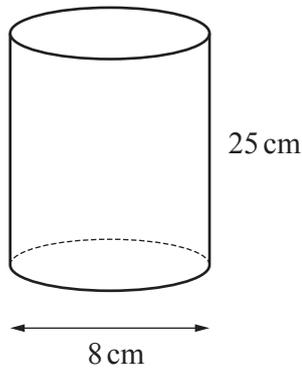
NOT TO SCALE

The diagram shows a solid cuboid.

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

..... [4]

(b)



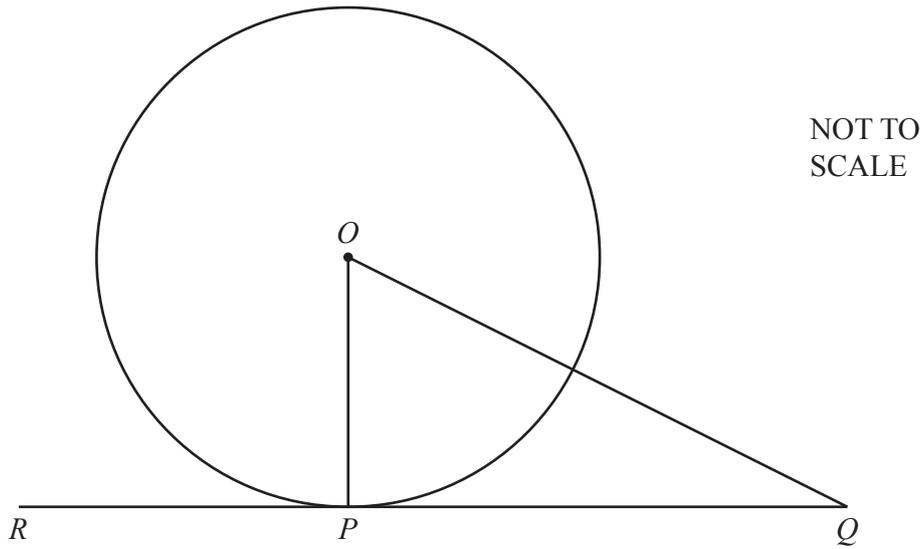
NOT TO SCALE

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 $OPQ = 90^\circ$ because
 [1]

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

(a) Work out OQ .

$OQ = \dots\dots\dots\text{ cm}$ [2]

(b) Work out angle OQP .

Angle $OQP = \dots\dots\dots$ [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.

..... km² [2]

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

..... [1]

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

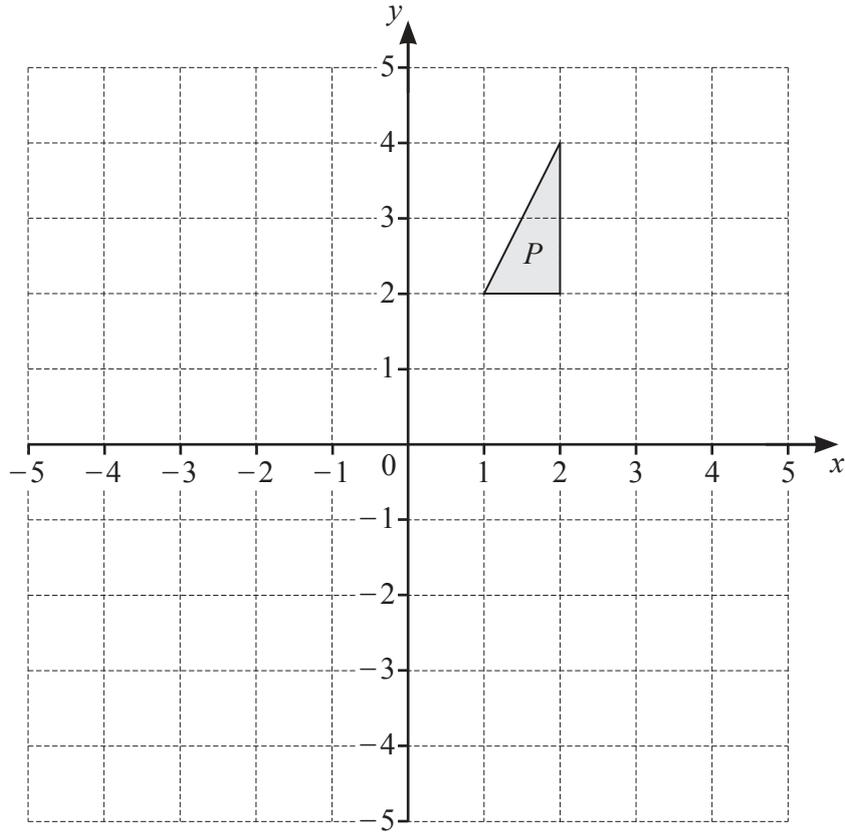
Work out the population density of Denmark.
Give your answer correct to the nearest integer.

..... people/km² [2]

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

Write 0.53 in standard form.

..... [1]



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

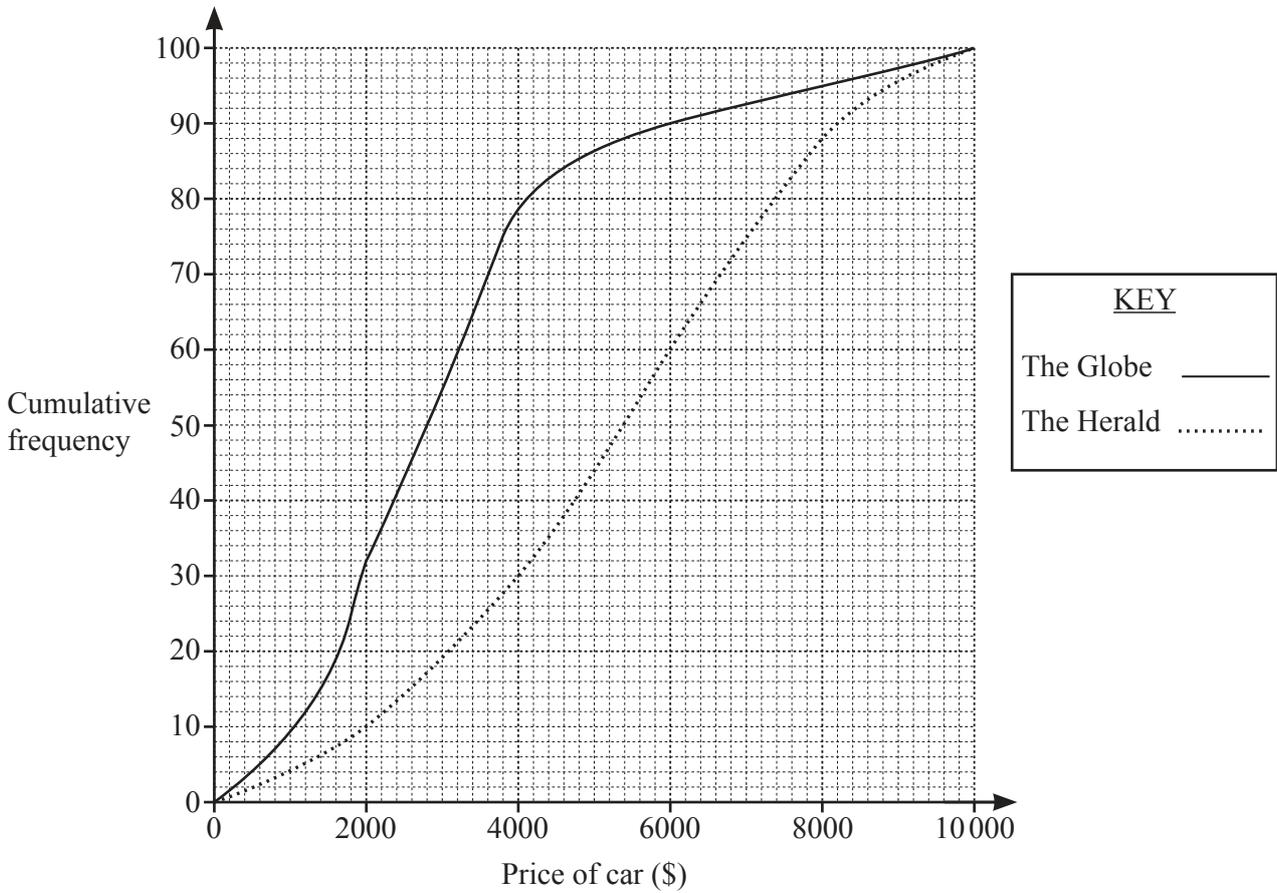
(ii) Reflect triangle *P* in the *y*-axis.
Label the image *Y*. [1]

(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.

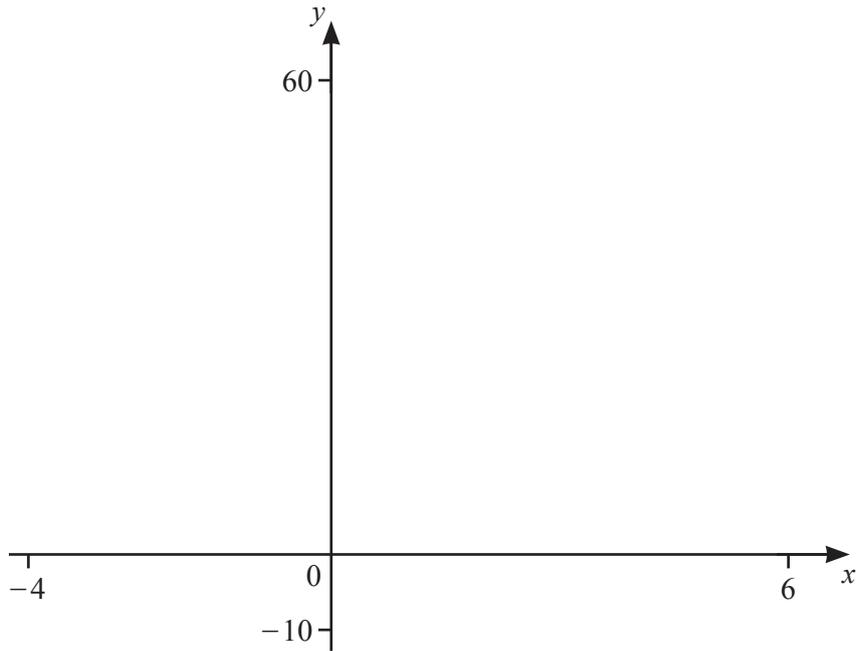
\$ [2]

(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]



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

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

$x = \dots\dots\dots$ [1]

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

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

$x = \dots\dots\dots$ and $x = \dots\dots\dots$ [2]

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