Cambridge IGCSE

Cambridge International Examinations
Cambridge International General Certificate of Secondary Education

CANDIDATE NAME	
CENTRE NUMBER	
CANDIDATE NUMBER	

7658374309

CAMBRIDGE INTERNATIONAL MATHEMATICS **0607/33**

Paper 3 (Core) **May/June 2016**

1 hour 45 minutes

Candidates answer on the Question Paper.

Additional Materials: Geometrical Instruments
Graphics Calculator

READ THESE INSTRUCTIONS FIRST

Write your Centre number, candidate number and name on all the work you hand in.
Write in dark blue or black pen.
Do not use staples, paper clips, glue or correction fluid.
You may use an HB pencil for any diagrams or graphs.
DO **NOT** WRITE IN ANY BARCODES.

Answer **all** the questions.
Unless instructed otherwise, give your answers exactly or correct to three significant figures as appropriate.
Answers in degrees should be given to one decimal place.
For π, use your calculator value.
You must show all the relevant working to gain full marks and you will be given marks for correct methods, including sketches, even if your answer is incorrect.
The number of marks is given in brackets [ ] at the end of each question or part question.
The total number of marks for this paper is 96.

This document consists of **18** printed pages and **2** blank pages.

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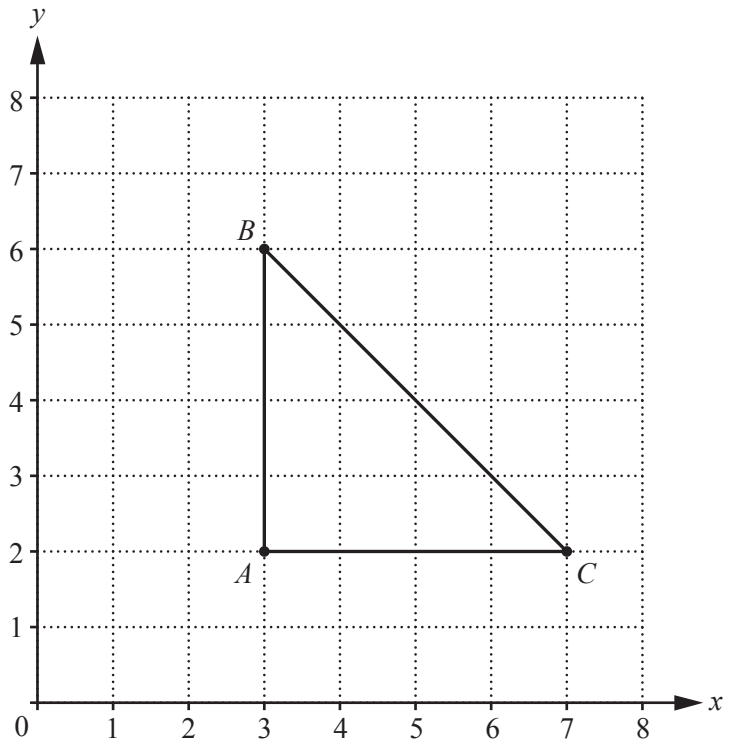
Formula List

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.	$V = \frac{4}{3}\pi r^3$

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Answer **all** the questions.

1



(a) Write down the co-ordinates of C.

(..... , ...) [1]

(b) Write down the mathematical name of triangle ABC.

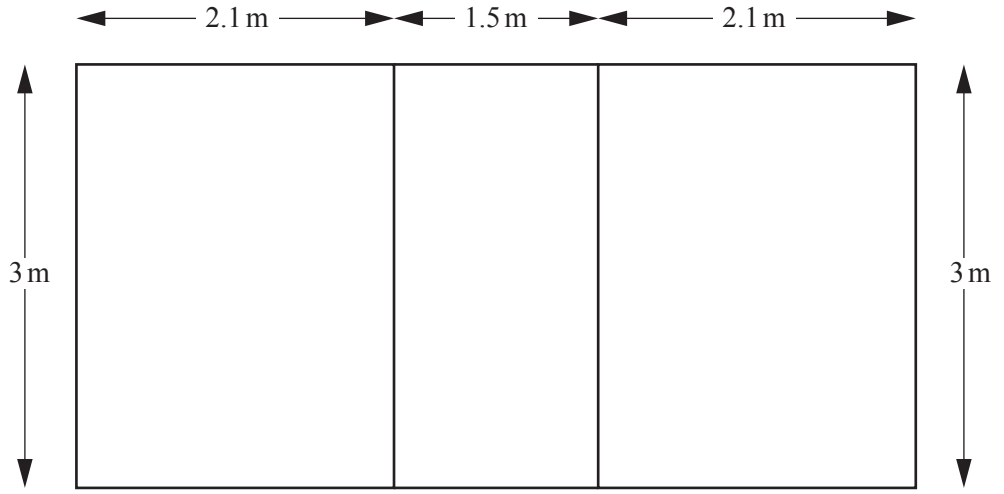
..... [1]

(c) Measure angle ACB.

..... [1]

(d) On the diagram, draw the line of symmetry of triangle ABC. [1]

2 Sophie is tiling three of the rectangular walls of a small bathroom.
The diagram shows the dimensions of the three walls.



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(a) Work out the total area of these three walls.
Give your answer in square centimetres.

..... cm^2 [4]

(b) Sophie chooses tiles measuring 30 cm by 30 cm to cover the three walls.

(i) Work out how many of these tiles she needs to cover all three walls.

..... [3]

(ii) The tiles can be plain or patterned.
Each type of tile is sold in boxes of 10.
Sophie decides to use 1 patterned tile for every 4 plain tiles.

Work out the number of boxes of each type of tile that Sophie needs to buy.

..... boxes of patterned tiles

..... boxes of plain tiles [5]

(c) The bathroom is a cuboid.

Work out the volume of the bathroom.

..... m^3 [2]

3 Ravi has 1 green sweet, 2 red sweets, 3 orange sweets and 6 yellow sweets in a bag.

(a) He picks a sweet at random from the bag.

(i) Which colour sweet is least likely to be picked?

..... [1]

(ii) Which colour sweet has a 50% chance of being picked?

..... [1]

(iii) Find the probability that he picks a red sweet.

..... [1]

(iv) Find the probability that he picks a purple sweet.

..... [1]

(b) Ravi eats two of the sweets from the bag.

From the ten sweets remaining in the bag

- the probability of picking a yellow sweet stays the same
- two of the colours have equal probability of being picked.

Work out the number of sweets of each colour that could be in the bag now.

Green .....

Red .....

Orange .....

Yellow ..... [3]

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4 **(a)** An electrician charges his customers using this formula.

Charge = \$65 × Number of hours + \$30

(i) Work out the charge when the job takes 4 hours.

\$ ..... [2]

(ii) For another job, the electrician charges \$485.

Work out the length of time this job takes.

..... hours [2]

(b) The electrician uses his van to travel to work.
One journey of 8 km takes 20 minutes.

Calculate the average speed of this journey.

..... km/h [2]

5 **(a)** 15 students go on a school trip.

The age of each student in years, correct to 1 decimal place, is listed below.

13.4	14.7	13.1	15.5	15.3
15.2	14.1	14.2	16.4	14.7
15.2	15.9	13.1	15.1	16.0

(i) Complete the ordered stem and leaf diagram to show this information. 16.0 has been entered for you.

13	
14	
15	
16	0

Key: ..... | ..... represents .....

[3]

(ii) Work out the range.

..... years [1]

(iii) Find the median.

..... years [1]

(b) Another student is 14 years 7 months old.

Write this student's age in years as a decimal, correct to 1 decimal place.

..... years [2]

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6 Here is a set of numbers.

$A = \{1, 4, 6, 7, 8, 9, 15\}$

(a) From this set choose

(i) a factor of 12,

..... [1]

(ii) $\sqrt{81}$,

..... [1]

(iii) a multiple of 5,

..... [1]

(iv) 2^3,

..... [1]

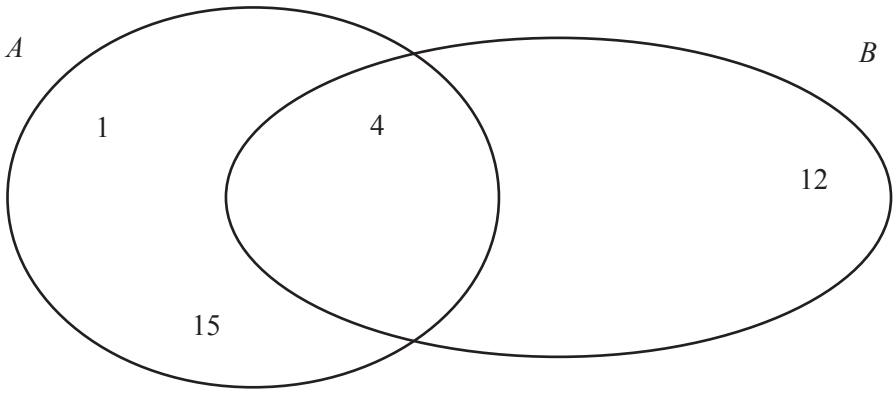
(v) a prime number.

..... [1]

(b) Here is another set of numbers.

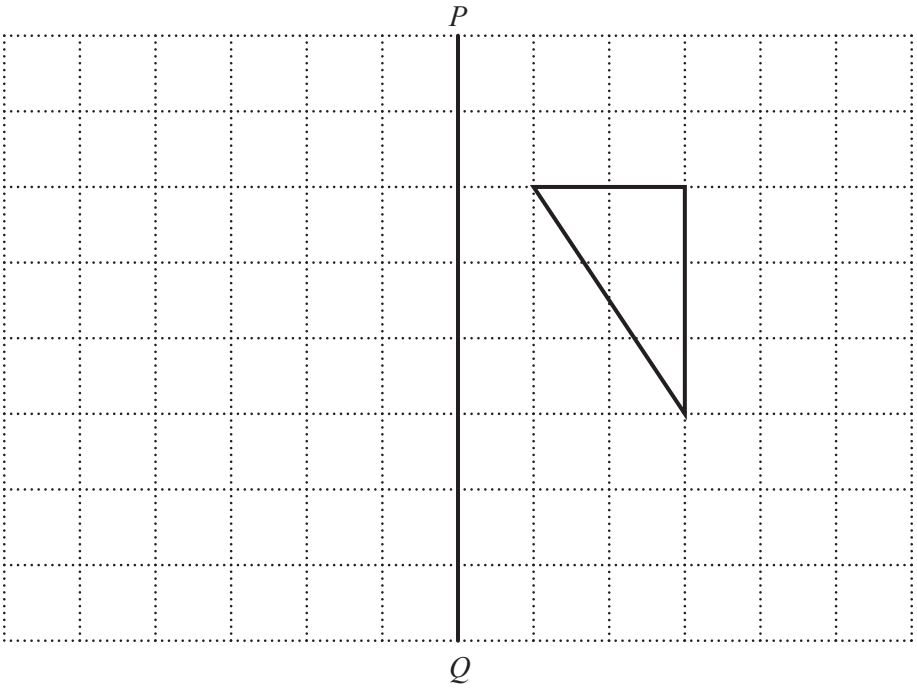
$B = \{2, 4, 6, 8, 10, 12, 14\}$

Complete the diagram for set A and set B.



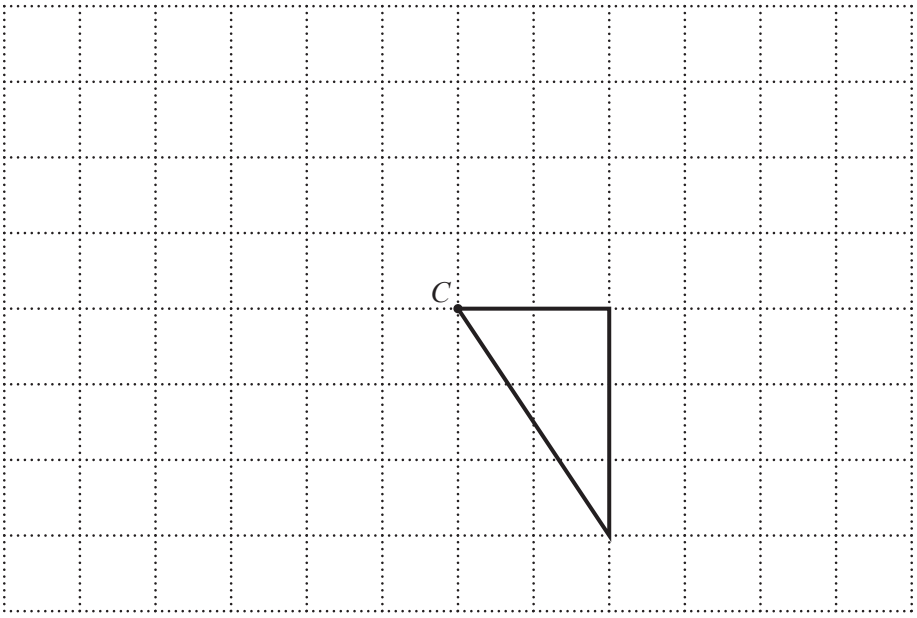
[3]

7 **(a)** Reflect the triangle in the line PQ.



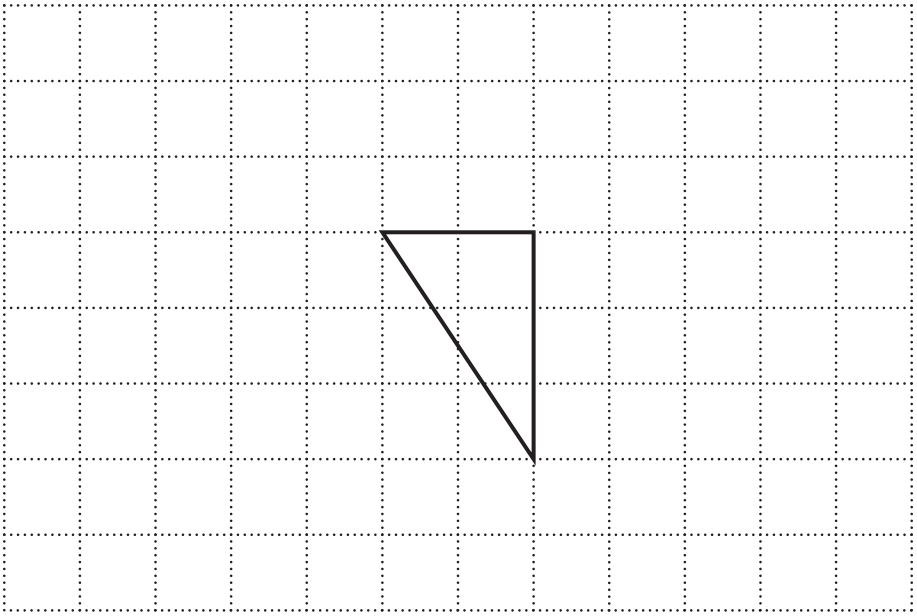
[1]

(b) Rotate the triangle through 90° clockwise about point C.



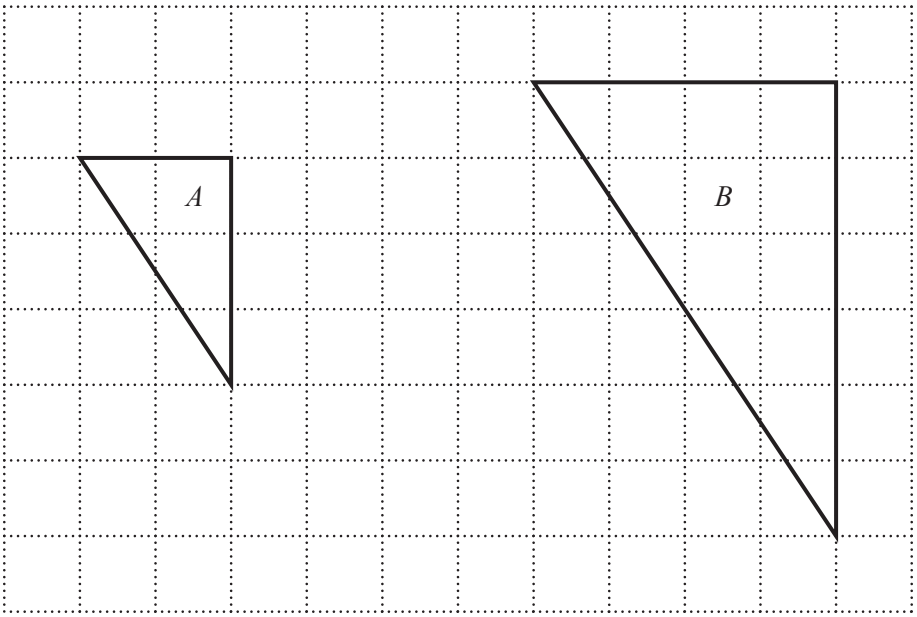
[2]

(c) Translate the triangle by the vector $\begin{pmatrix} 3 \\ 2 \end{pmatrix}$.



[2]

(d) Write down as much information as you can about the **single** transformation that maps triangle *A* onto triangle *B*.



..... [2]

8 **(a)** Solve these equations.

(i) $\frac{x}{2} = 4$

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

(ii) $x + 3 = -1$

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

(iii) $2(6x - 5) = 8$

$x =$ ..... [3]

(b) Solve these simultaneous equations.

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

$x =$ .....

$y =$ ..... [2]

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9 **(a)** Here are some test results for Akbar.

Subject	English (out of 60)	Mathematics (out of 40)	Science (out of 70)
Mark	48	34	49

In which subject did Akbar get the highest percentage?
Show clearly how you decide.

[3]

(b) Last year Akbar's mark in his History test was 60.
This year his mark increased by 35%.

Work out Akbar's mark in his History test this year.

..... [3]

10 **(a)** Show that $(4, 5)$ is a point on the line $y = 2x - 3$.

[2]

(b) Write down the gradient of the line $y = 2x - 3$.

..... [1]

(c) Write down the equation of the line parallel to $y = 2x - 3$ that passes through the point $(0, 1)$.

..... [2]

(d) Rearrange this equation to make x the subject.

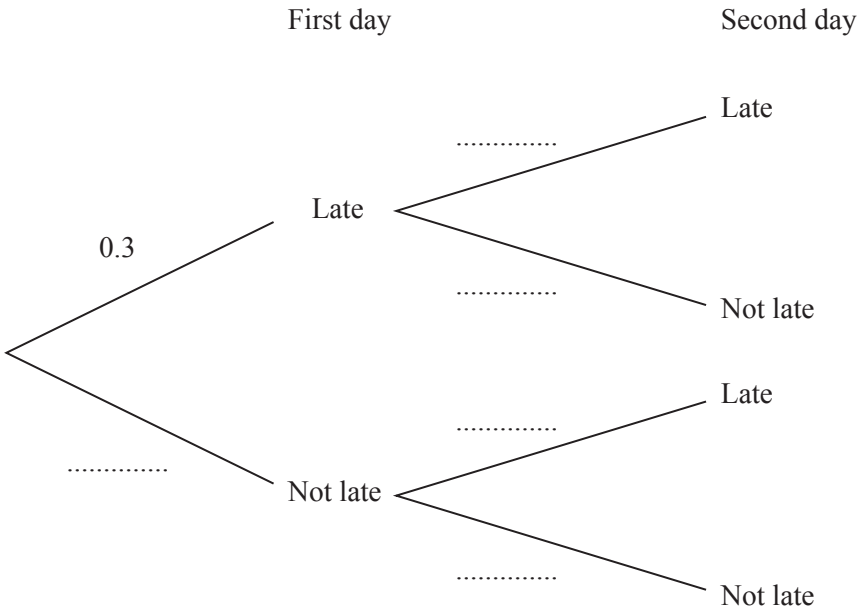
$$y = 2x - 3$$

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

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11 The probability that Joe is late for school on any day is 0.3 .

(a) Complete the tree diagram for two days.



[2]

(b) Work out the probability that Joe will be late for school on both days.

..... [2]

12 **(a)** Simplify.

$$\frac{18x^2}{2x}$$

..... [2]

(b) Factorise fully.

$$3x^2 + 6x$$

..... [2]

(c) Show the inequality $x \geqslant 3$ on the number line.



[1]

(d) List the integer values which satisfy the inequality $4 < x \leqslant 7$.

..... [1]

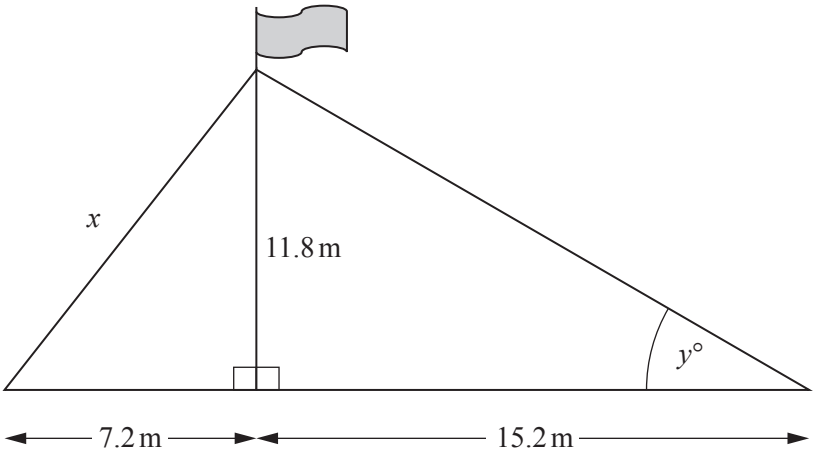
(e) Multiply out the brackets and simplify.

$$(x + 3)(x - 2)$$

..... [2]

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13 The diagram shows a flagpole that is held in position by two straight wires.
The wires are attached to the flagpole 11.8 m above the ground.



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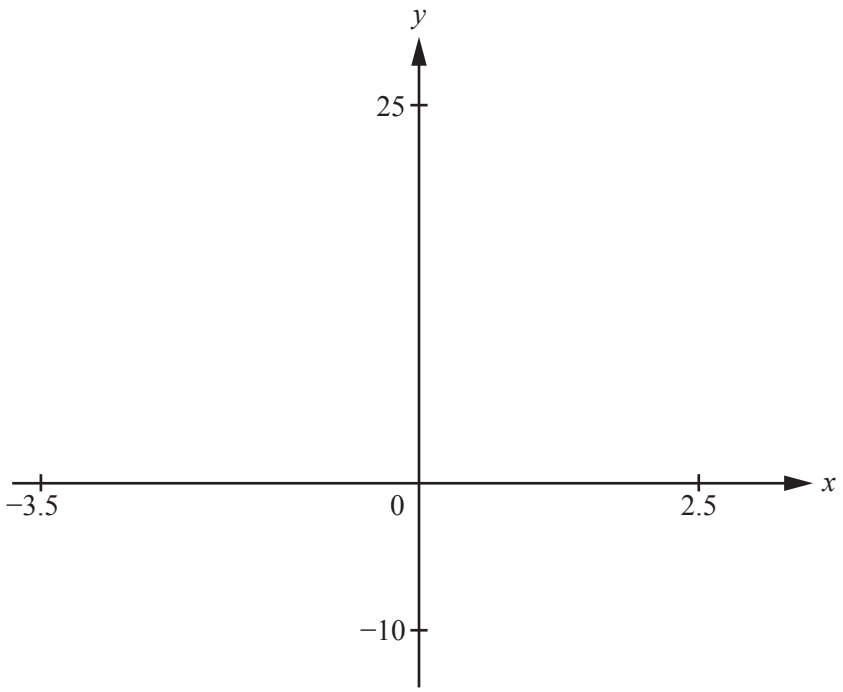
(a) Calculate the length of the wire, x.

..... m [2]

(b) Use trigonometry to calculate the size of angle y.

..... [2]

14



(a) On the diagram, sketch the graph of $y = 2x^3 + 3x^2 - 12x$ for $-3.5 \leqslant x \leqslant 2.5$. [2]

(b) Write down the co-ordinates of the local maximum and the local minimum.

Local maximum (..... , ...)

Local minimum (..... , ...) [2]

(c) Write down the co-ordinates of the points where the curve crosses the axes.

(..... , ...) (..... , ...) (..... , ...) [3]

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