



CANDIDATE  
NAME

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CENTRE  
NUMBER

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CANDIDATE  
NUMBER

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## 0607/04

**For examination from 2025**

**1 hour 30 minutes**

You will need: Geometrical instruments

- 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. 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  $\pi$ , use either your calculator value or 3.142.

- The total mark for this paper is 75.
- The number of marks for each question or part question is shown in brackets [ ].

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**[Turn over**

## List of formulas

Area,  $A$ , of triangle, base  $b$ , height  $h$ .

$$A = \frac{1}{2}bh$$

Area,  $A$ , of circle of radius  $r$ .

$$A = \pi r^2$$

Circumference,  $C$ , of circle of 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  $l$ .

$$A = \pi rl$$

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  $h$ .

$$V = \frac{1}{3}\pi r^2 h$$

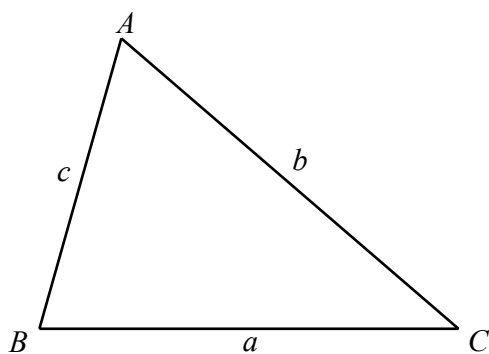
Volume,  $V$ , of sphere of radius  $r$ .

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

For the equation  $ax^2 + bx + c = 0$ , where  $a \neq 0$ ,

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

For the triangle shown,



$$\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$$

$$a^2 = b^2 + c^2 - 2bc \cos A$$

$$\text{Area} = \frac{1}{2}ab \sin C$$

- 1 The table shows the marks scored by each of 75 students in a test.

Mark	0	1	2	3	4	5	6	7	8	9	10
Number of students	1	4	5	6	9	10	11	7	6	13	3

- (a) Write down the mode.

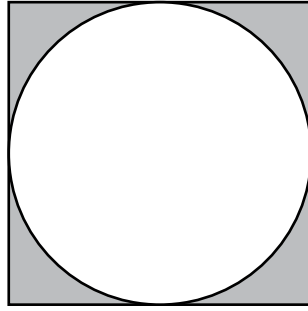
..... [1]

- (b) Write down the range.

..... [1]

- (c) Find the median.

..... [1]



A circle of radius  $r$  cm is inside a square.  
The circle touches the sides of the square.

- (a) (i) Find an expression for the area of the shaded region in terms of  $\pi$  and  $r$ .

..... [2]

- (ii) Calculate the area of the shaded region when  $r = 6$ .

.....  $\text{cm}^2$  [1]

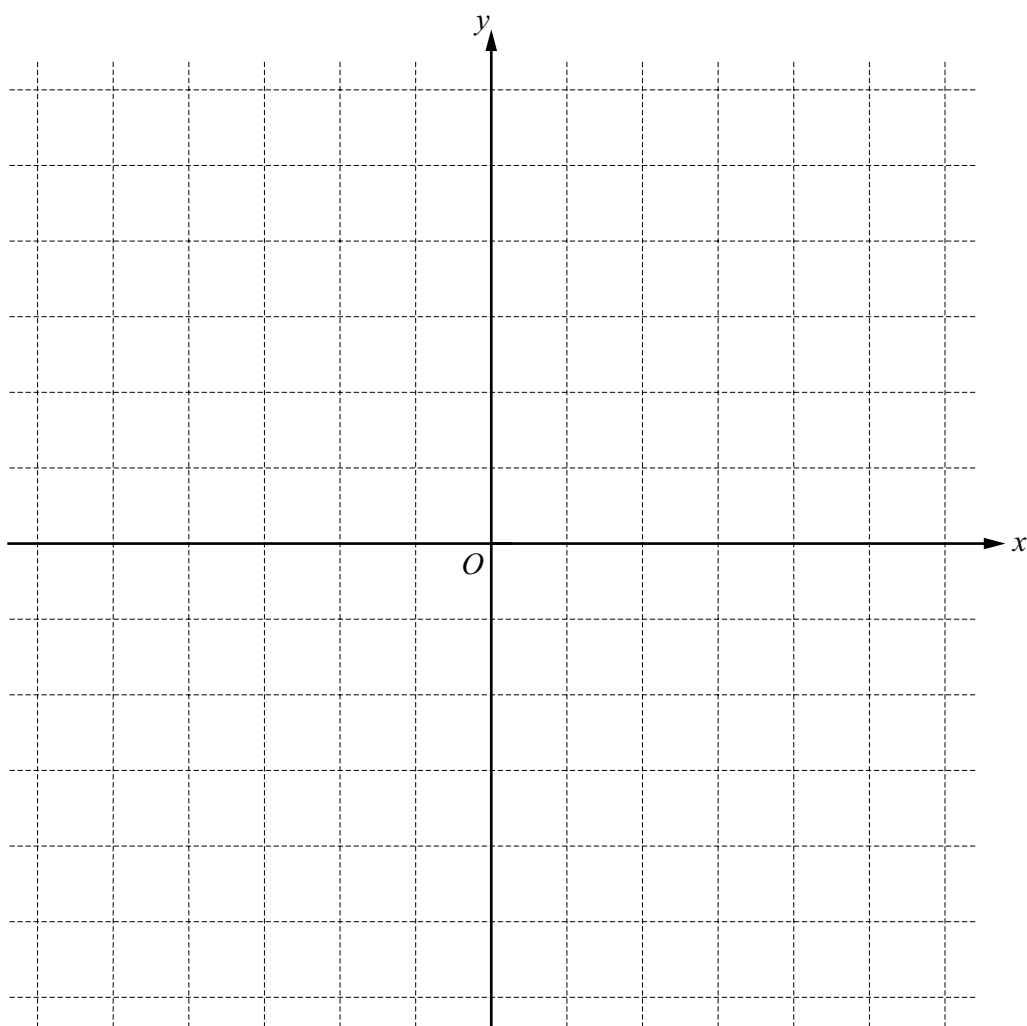
- (b) The perimeter of the shaded region is 71.415 cm, correct to 3 decimal places.

Find the value of  $r$ .

Give your answer correct to the nearest integer.

$r =$  ..... [2]

- 3 You may use the grid to help you answer this question.



The transformation P is a rotation of  $90^\circ$  clockwise about  $O$ .

The transformation Q is a reflection in the line  $y = -x$ .

- (a) Find the coordinates of the image of the point  $(4, 1)$  under the transformation P.

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

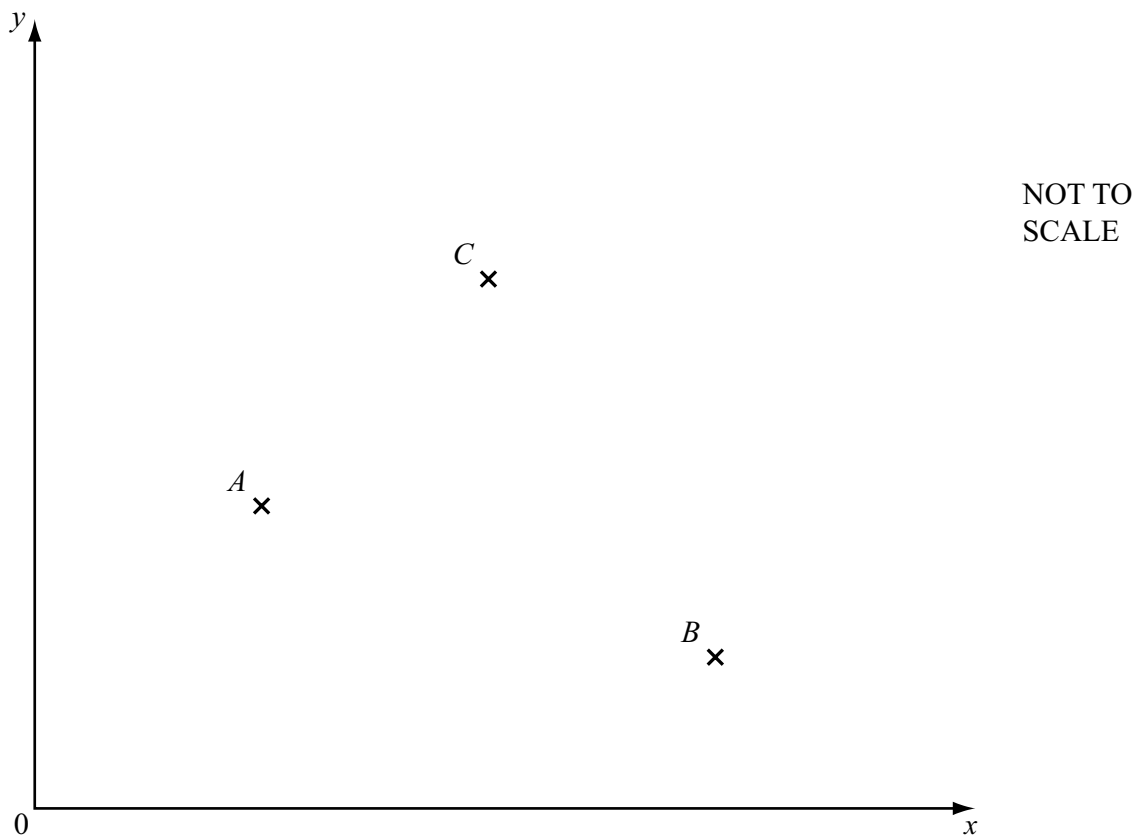
- (b) Find the coordinates of the image of the point  $(4, 1)$  under the transformation Q.

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

- (c) Find the coordinates of the image of the point  $(x, y)$  under the transformation P followed by the transformation Q.

(....., .....) [2]

- 4 The points  $A$  (3, 4),  $B$  (9, 2) and  $C$  (6, 7) are shown on the diagram below.



- (a) Write down  $\overrightarrow{AB}$ .

$\left( \begin{array}{c} \phantom{0} \\ \phantom{0} \end{array} \right)$  [1]

- (b) Find the equation of the line  $AB$ .

..... [3]

- (c)  $C$  is the midpoint of  $AY$ .

Find the co-ordinates of  $Y$ .

(..... , ..... ) [2]

- (d) The point  $X$  is such that  $ABXC$  is a parallelogram.  
The coordinates of  $X$  are  $(12, k)$ .

Find the value of  $k$ .

$k =$  ..... [1]

- 5 Bev has \$ $x$ .

She spends  $\frac{1}{4}$  of her money on rent and  $\frac{2}{9}$  of her money on food.

After she pays for rent and food, she spends  $\frac{1}{3}$  of the **remaining money** on clothes.

She has \$152 left.

Find the value of  $x$ .

..... [3]

- 6 The heights of 100 plants are shown in the table.

Height ( $x$ cm)	Frequency
$0 < x \leq 10$	7
$10 < x \leq 20$	13
$20 < x \leq 30$	20
$30 < x \leq 40$	32
$40 < x \leq 50$	28

- (a) Calculate an estimate of the mean height of the plants.

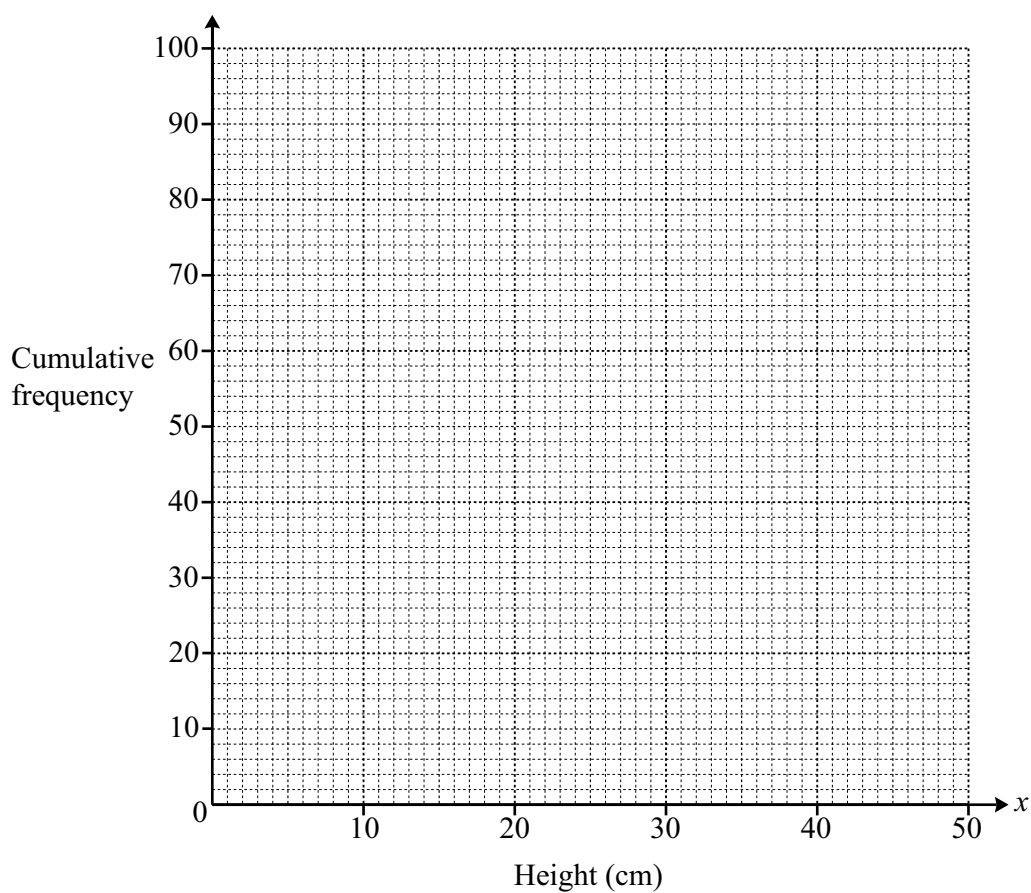
..... cm [2]

- (b) (i) Complete the cumulative frequency table for the plants.

Height ( $x$ cm)	Frequency
$0 < x \leq 10$	7
$0 < x \leq 20$	
$0 < x \leq 30$	
$0 < x \leq 40$	
$0 < x \leq 50$	100

[1]

(ii) On the grid, draw a cumulative frequency diagram.



[2]

(c) Use your diagram in **part (b)(ii)** to find an estimate for

(i) the lower quartile

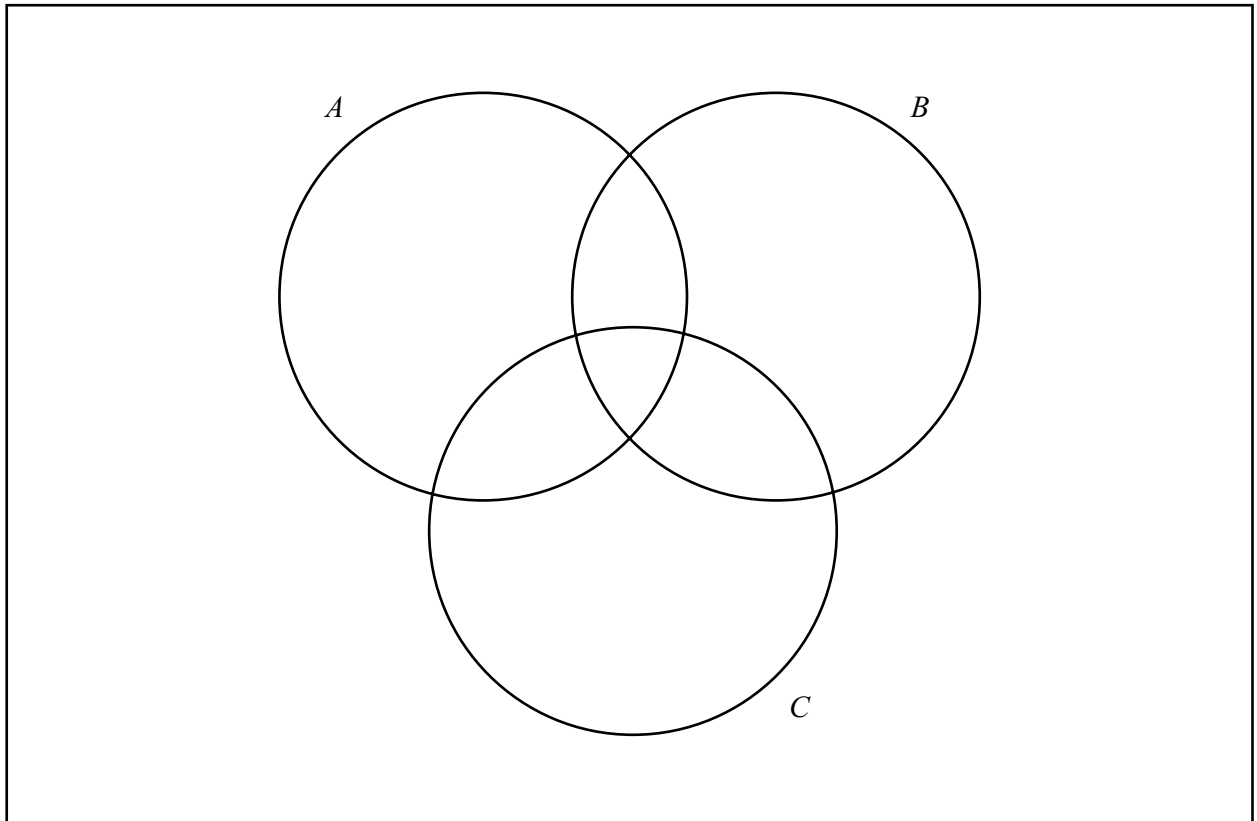
..... cm [1]

(ii) the number of plants that have heights greater than 45 cm.

..... [2]

7 The Venn diagram shows the sets  $A$ ,  $B$  and  $C$ .

$U$



$U = \{\text{integers between 24 and 37, but excluding 24 and 37}\}$

$A = \{\text{prime numbers}\}$

$B = \{\text{square numbers}\}$

$C = \{\text{multiples of 4}\}$

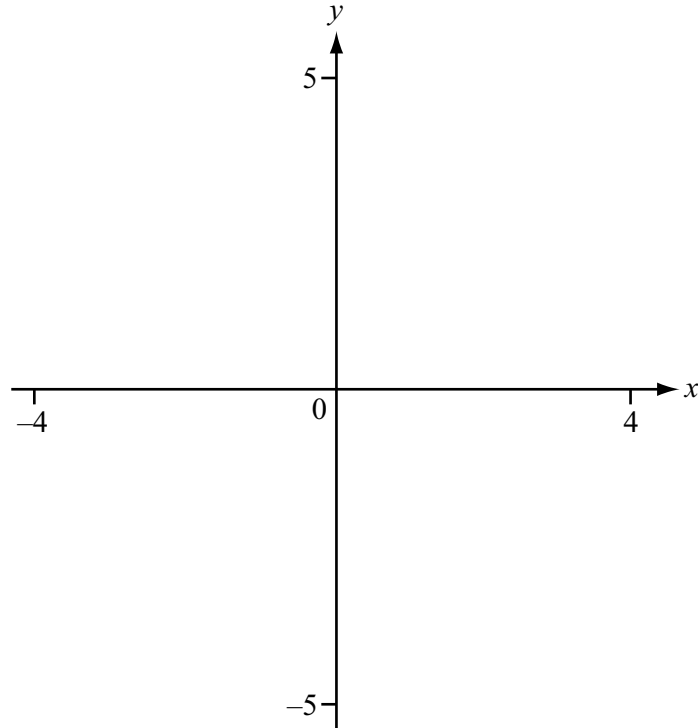
(a) List the elements of set  $A$ .

..... [1]

(b) Write all the elements of  $U$  in the correct parts of the Venn diagram. [3]

(c) Find  $n((A \cup C) \cap B')$ .

..... [1]



$$f(x) = 2 - \frac{1}{(2x+3)}$$

**(a) (i)** On the diagram, sketch the graph of  $y = f(x)$ , for values of  $x$  between  $-4$  and  $4$ . [2]

**(ii)** Write down the coordinates of the point where the graph crosses the  $x$ -axis.

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

**(b)** Solve the inequality  $f(x) < 4$ .

..... [2]

9 Factorise.

(a)  $9x^2 - 4y^{16}$

..... [2]

(b)  $6cd - 3 - 9d + 2c$

..... [2]

10  $y$  varies inversely as the square of  $x$ .  
 $y = 5$  when  $x = 3$ .

(a) Find  $y$  in terms of  $x$ .

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

(b)  $z$  varies directly as the square root of  $y$ .  
 $z = 12$  when  $y = 9$ .

Use your answer to **part (a)** to find  $z$  in terms of  $x$ .

$z =$  ..... [3]

- 11** Herman bought a motorbike on January 1st 2020.  
By January 1st 2021, the value of the motorbike had decreased by 16%.  
By January 1st 2022, the value of the motorbike had decreased by 12% of the value on January 1st 2021.  
The value of the motorbike on January 1st 2022 was \$7392.

**(a)** Find how much Herman paid for the motorbike.

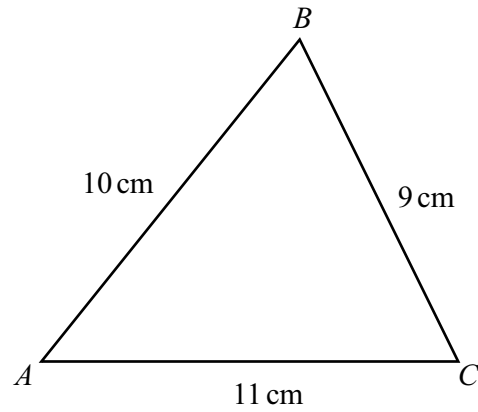
\$ ..... [3]

**(b)** From 2022, the value of the motorbike decreases by 8% each year.

Find the year in which the value of the motorbike will first be below \$5000.

..... [4]

12



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- (a) Show that  $\cos B = \frac{1}{3}$ .

[2]

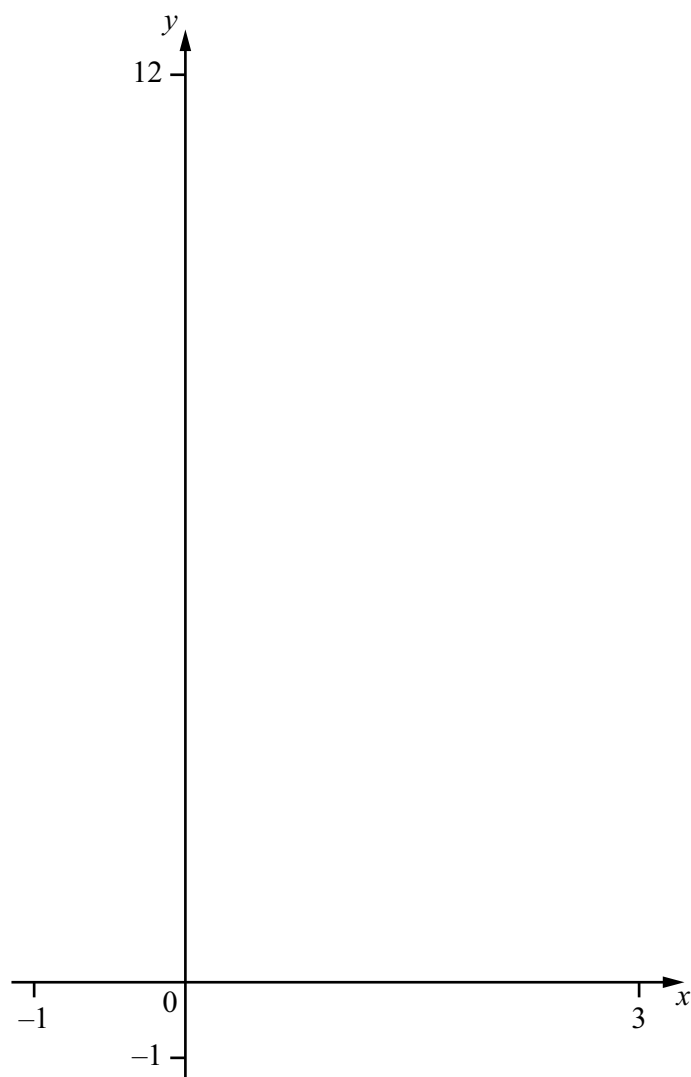
- (b) (i) Use Pythagoras' theorem to show that  $\sin B = \frac{2\sqrt{2}}{3}$ .

[2]

- (ii) Find the exact value of the area of triangle  $ABC$ .

..... $\text{cm}^2$  [2]

- 13 Using a suitable sketch, solve  $5^x = 10$ .  
Give your answer correct to 3 decimal places.



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

**14 (a)**  $a^b = 1$  where  $a > 0$

**(i)** When  $b = 13$ , write down the value of  $a$ .

$a = \dots\dots\dots [1]$

**(ii)** When  $a = 17$ , write down the value of  $b$ .

$b = \dots\dots\dots [1]$

**(b)** Use **part (a)** to find **all** the solutions to the following equation.

$$(x^2 - 4x + 4)^{(x-5)} = 1$$

$\dots\dots\dots [4]$

**15** Make  $x$  the subject of the formula.

$$3ax = 1 - \frac{2x}{a+2}$$

$$x = \dots\dots\dots [4]$$

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