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CANDIDATE NAME

CENTRE NUMBER

CANDIDATE NUMBER

0501850549

MATHEMATICS **0580/32**

Paper 3 (Core) **October/November 2024**

2 hours

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 calculator where appropriate.
- You may use tracing paper.
- You must show all necessary working clearly.
- 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 either your calculator value or 3.142.

INFORMATION

- The total mark for this paper is 104.
- The number of marks for each question or part question is shown in brackets [ ].

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

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[Turn over

1 **(a)** Onions cost \$1.85 per kilogram and potatoes cost \$2.34 per kilogram.
Sophie buys 2.4 kg of onions and 4.5 kg of potatoes.

Work out how much change she receives from \$20.

\$ ..... [3]

(b) Sophie gets on a bus at 1047 and she gets off the bus 36 minutes later.

Work out the time she gets off the bus.

..... [1]

(c) Sophie uses two-thirds of a litre of milk each day.
Milk is sold in 2-litre bottles.

Show that she needs at least 3 bottles to have enough milk for 7 days.

[2]

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(d) One month, Helen sells phones and computers in the ratio

number of phones : number of computers = 3 : 5.

She sells 40 computers.

Work out how many phones she sells.

..... [2]

(e) In 2022 Helen sells 520 phones.
In 2023 she sells 35% more phones than in 2022.

Calculate the number of phones she sells in 2023.

..... [2]

(f) A television costs $840 in the USA.
The same television costs 3549 ringgits in Malaysia.
The exchange rate is $1 = 4.2 ringgits.

In which country is the television cheaper and by how many dollars?

Cheaper in ..... by $..... [2]

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2 **(a)**

3.142	$\sqrt{87}$	14	41	56	117	121

From this list, write down

(i) an odd number

..... [1]

(ii) a factor of 28

..... [1]

(iii) a square number

..... [1]

(iv) a prime number

..... [1]

(v) a multiple of 9.

..... [1]

(b) Write down the value of 5^0.

..... [1]

(c) Write 60 as a product of its prime factors.

..... [2]

(d) Calculate the value of $\sqrt[3]{157\,464}$.

..... [1]

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(e) By rounding each number in the calculation correct to 1 significant figure, find an estimate for the value of

$$\frac{67.8 \times 2.38}{4.803 + 29.87}.$$

You must show all your working.

..... [2]

(f) **(i)** 9.78×10^8 2.04×10^9

Which of these two numbers is larger?
Give a reason for your answer.

..... is larger because ..... [1]

(ii) Calculate $1.732 \times 10^3 \div 5.73 \times 10^{-1}$.
Give your answer in standard form.

..... [2]

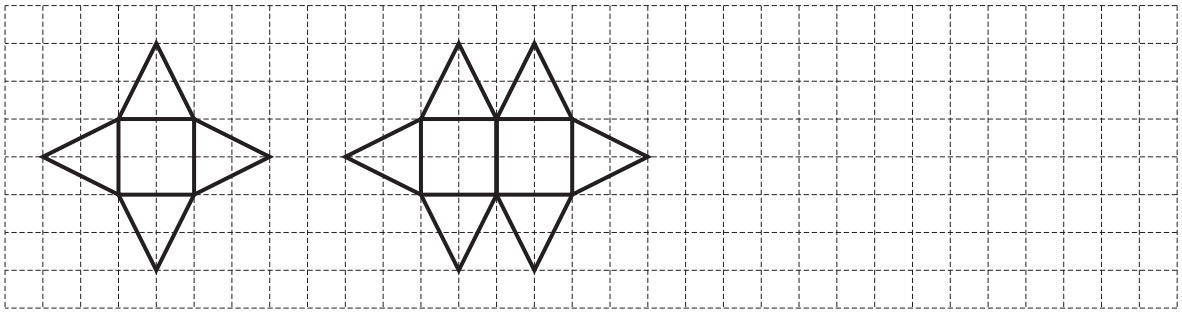
(g) Two cars go round a track.
One car completes each lap of the track in 96 seconds.
The other car completes each lap in 120 seconds.
Both cars start a lap together at 08 37.

Find the next time when both cars start a lap together.

..... [3]

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3 **(a)** A sequence of shapes is made with squares and triangles.



Shape 1 Shape 2 Shape 3

(i) On the grid, draw Shape 3. [1]

(ii) Find the number of triangles in Shape 5.

..... [1]

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

32 25 18 11

(i) Find the next two terms.

..... , ... [2]

(ii) Write down the term to term rule for this sequence.

..... [1]

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(c) (i) 5, 8, 11, 14, ...

Find the nth term of this sequence.

..... [2]

(ii) 1, 8, 27, 64, ...

Find the nth term of this sequence.

..... [1]

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4 **(a)** Calculate the volume of a cylinder with radius 7.8 cm and height 15 cm.

..... cm^3 [2]

(b) A cube has a volume of 3375 cm^3.

Calculate the surface area of this cube.

..... cm^2 [3]

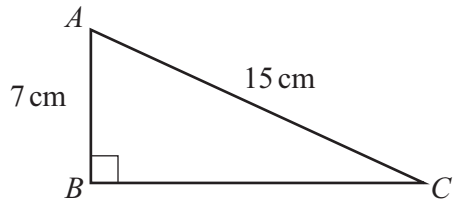
(c) Area $A = 37\,000\ cm^2$ Area $B = 5.4\ m^2$

Which of these two areas is the larger?
You must show all your working.

Area ..... [2]

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(d) The diagram shows a right-angled triangle *ABC*.

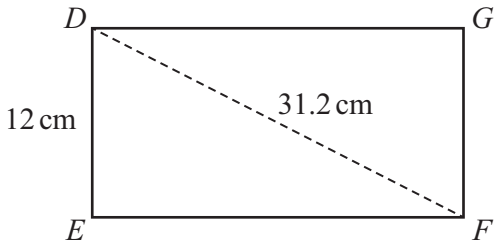


NOT TO SCALE

Calculate angle *ACB*.

Angle *ACB* = ... [2]

(e) The diagram shows a rectangle *DEFG*.



NOT TO SCALE

DE = 12 cm and *DF* = 31.2 cm.

Calculate the area of the rectangle *DEFG*.

..... cm^2 [4]

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5 **(a)** Students solve a puzzle by making guesses.
The table shows the number of guesses that each of 40 students make.

Number of guesses	1	2	3	4	5	6
Frequency	2	4	8	7	12	7

(i) Find the mode.

..... [1]

(ii) Calculate the mean.

..... [3]

(b) In another puzzle each student gets a score.
These are the scores for 12 students.

17 21 24 32 27 11

26 18 10 29 14 24

(i) Complete the stem-and-leaf diagram for these scores.

1	
2	
3	

Key : 1 | 7 represents 17

[2]

(ii) Find the median.

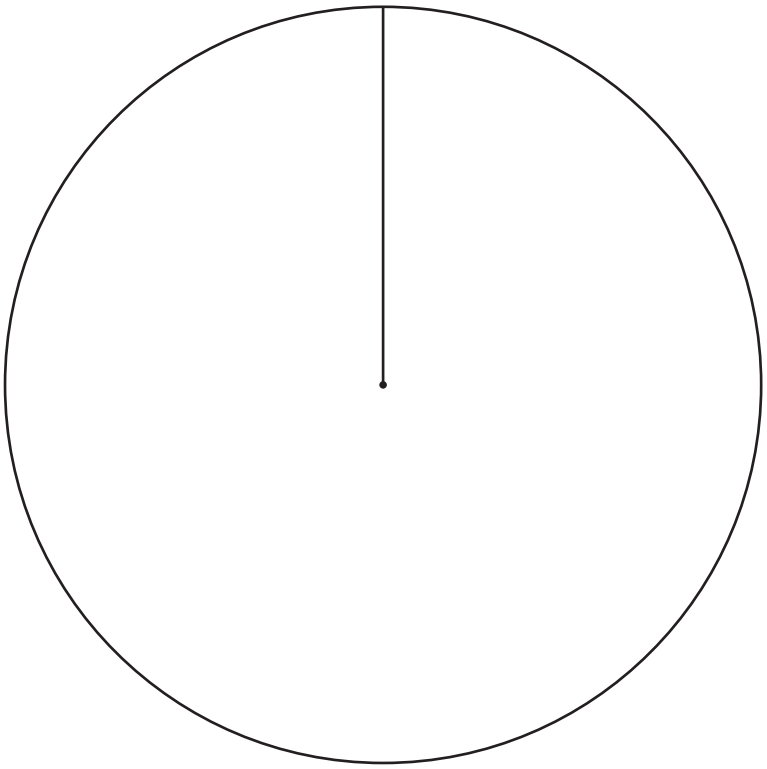
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(c) A different puzzle has three outcomes: win, draw or lose.
The table shows the outcomes for 30 students.

Outcome	Frequency
Win	9
Draw	14
Lose	7

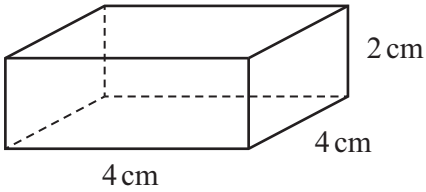
Complete the pie chart to show this information.



[4]

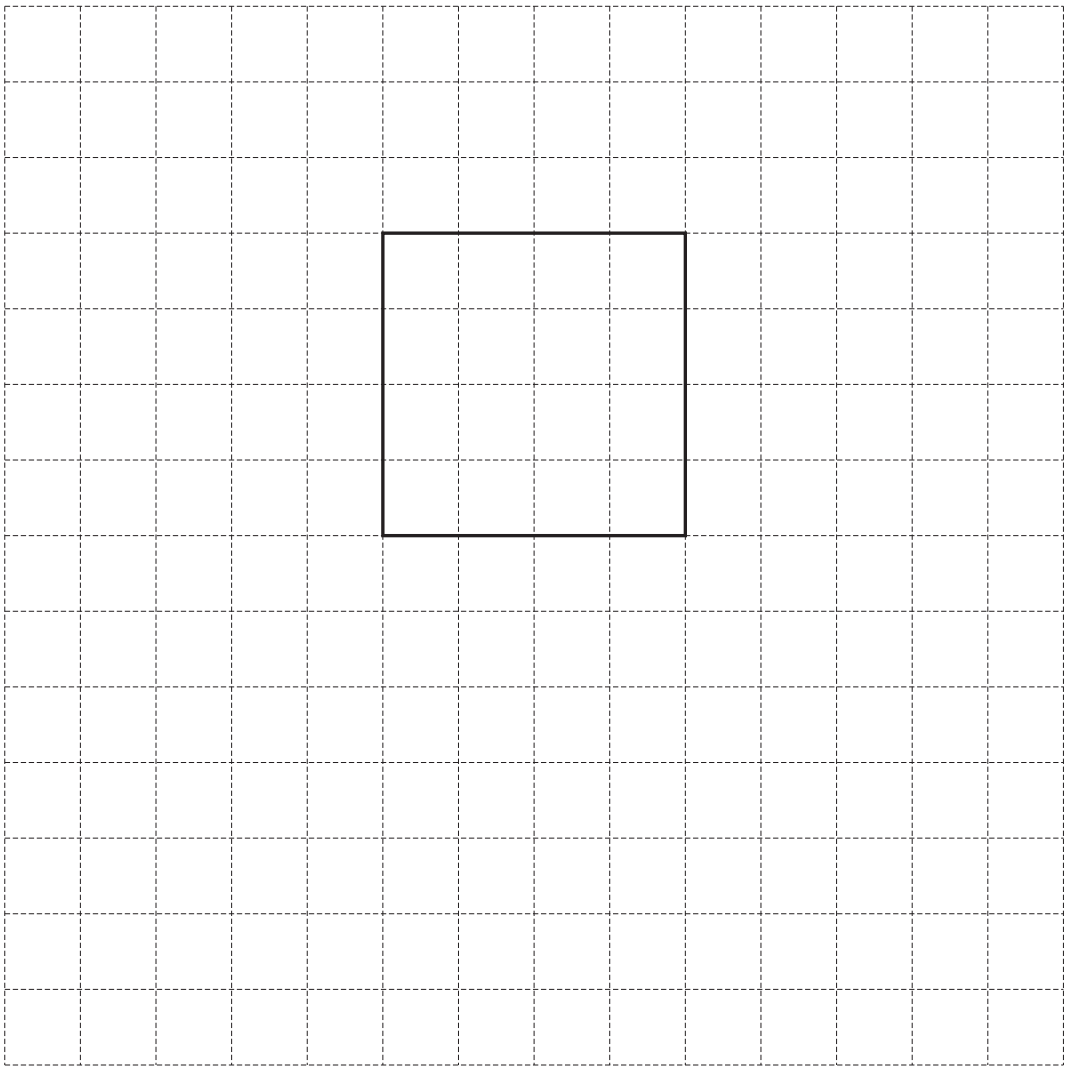
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6 **(a)** The diagram shows a cuboid.



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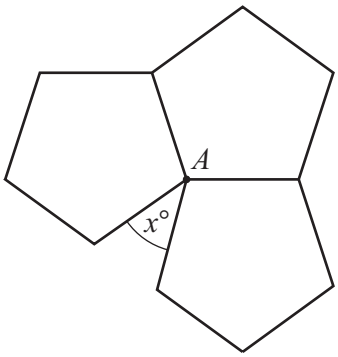
On the 1 cm^2 grid, complete a net of this cuboid.
One face has been drawn for you.



[3]

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(b) Three regular pentagons meet at point A.

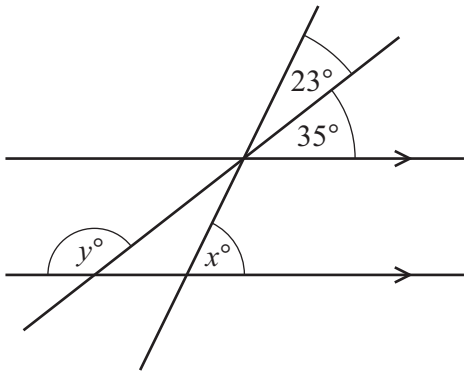


NOT TO SCALE

Work out the value of x.

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

(c) The diagram shows two parallel lines and two straight lines.



NOT TO SCALE

(i) Find the value of x.
Give a geometrical reason for your answer.

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

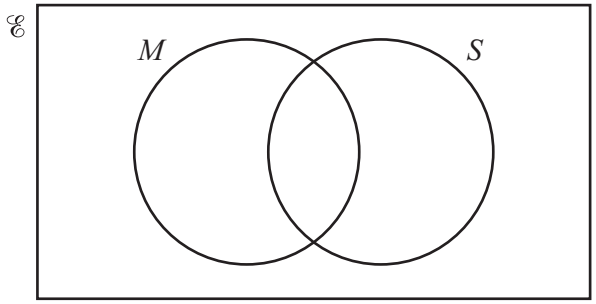
(ii) Find the value of y.

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

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7 **(a)** $\mathscr{E}$ = {students in a group}
M = {students who pass the mathematics test}
S = {students who pass the science test}

142 students are in the group.
105 students pass the mathematics test.
82 students pass the mathematics test and pass the science test.
17 students do **not** pass the mathematics test and do **not** pass the science test.



(i) Complete the Venn diagram. [2]

(ii) Find $n(M \cup S)$.

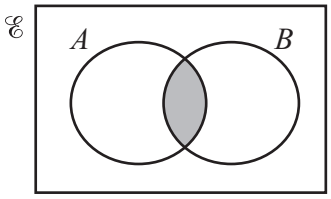
..... [1]

(iii) One of these students is picked at random.

Find the probability that this student passes the science test but does **not** pass the mathematics test.

..... [1]

(b)



Use set notation to describe the shaded region.

..... [1]

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(c) In a town, the number of students, n, who take the science test is 10 600, correct to the nearest hundred.

Complete this statement about the value of n.

..... $\leqslant n <$ ..... [2]

(d) The table shows the number of students in another town who took the science test in 2022 and 2023.

Year	2022	2023
Number of students	15 800	17 064

Calculate the percentage increase in the number of students from 2022 to 2023.

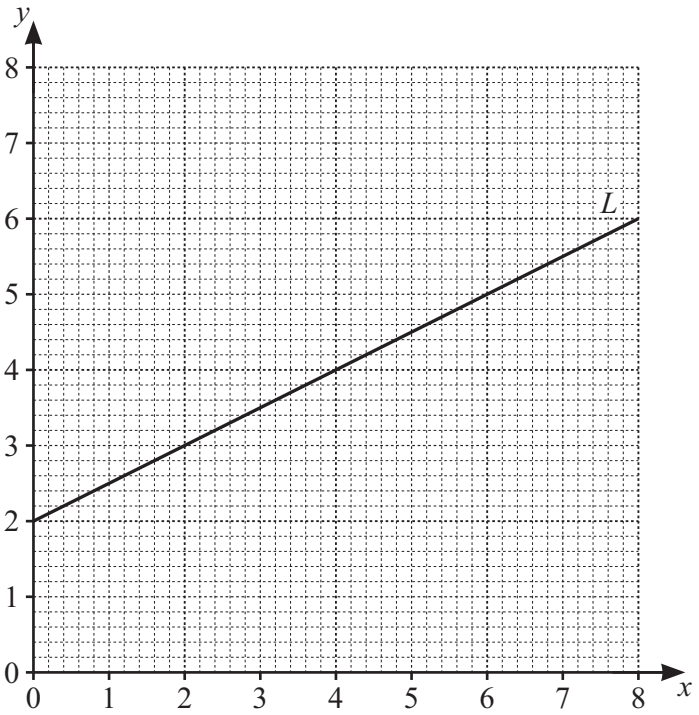
..... % [2]

(e) The number of students who took the mathematics test in 2022 is 18 400.
The ratio number of students who passed : number of students who did **not** pass is 4 : 1.

Work out the number of students who passed.

..... [2]

8 (a)



(i) Find the equation of line L in the form $y = mx + c$.

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

(ii) (a) Complete the table of values for $y = 8 - 2x$.

x	0	2	4
y		4	

[2]

(b) On the grid, draw the graph of $y = 8 - 2x$ for $0 \leqslant x \leqslant 4$. [1]

(iii) Find the coordinates of the point where line L intersects the graph of $y = 8 - 2x$.

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

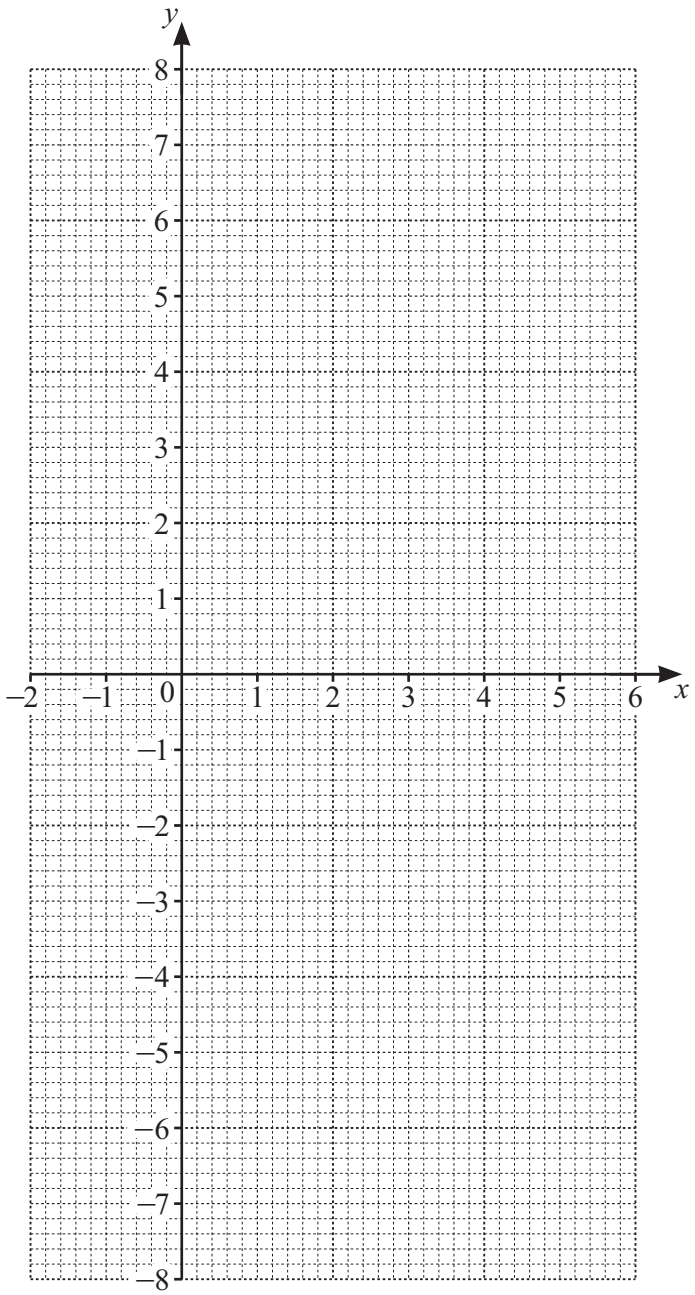
(b) (i) Complete the table of values for $y = x^2 - 4x - 4$.

x	−2	−1	0	1	2	3	4	5	6
y	8		−4		−8		−4		8

[2]

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(ii) On the grid, draw the graph of $y = x^2 - 4x - 4$ for $-2 \leqslant x \leqslant 6$.



[4]

(iii) Write down the equation of the line of symmetry of the graph.

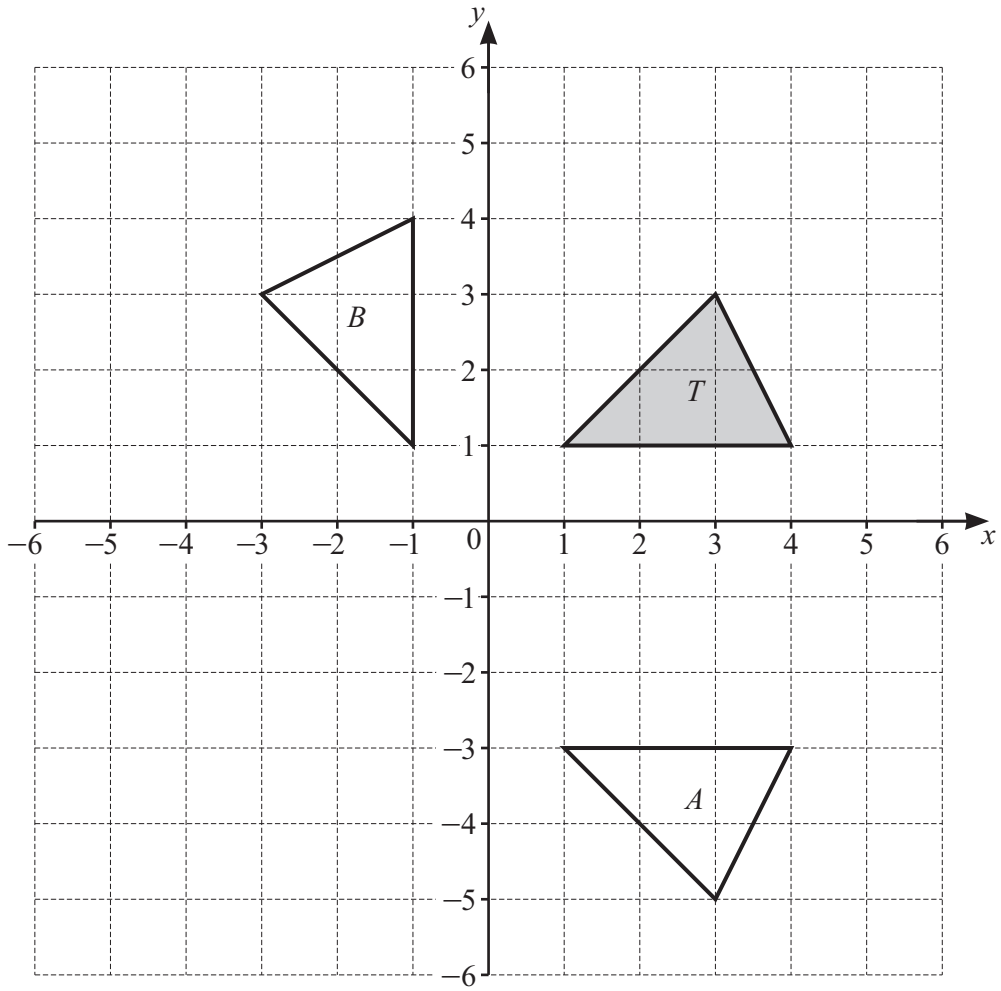
..... [1]

(iv) Use your graph to solve the equation $x^2 - 4x - 4 = 0$.

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

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(a) On the grid, translate triangle T by the vector $\begin{pmatrix} -5 \\ -4 \end{pmatrix}$. [2]

(b) Describe fully the **single** transformation that maps triangle T onto triangle A.

.....

..... [2]

(c) Describe fully the **single** transformation that maps triangle T onto triangle B.

.....

..... [3]

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