Cambridge Assessment International Education

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MATHEMATICS **0580/33**

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 [ ].

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1 **(a)** **(i)** Li has \$20.
A box of cereal costs \$2.29 .

View solution

Work out the maximum number of boxes of cereal that Li can buy.

..... [2]

(ii) Each box of cereal has mass 615 g.

View solution

Work out the total mass of 5 boxes of cereal.
Give your answer in kilograms.

..... kg [2]

(iii) The box of cereal is a cuboid.
The cuboid measures 25 cm by 20 cm by 5 cm.

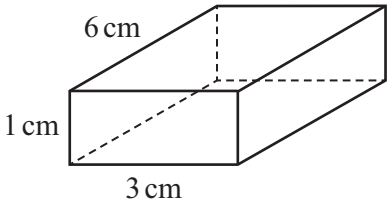
View solution

Work out the volume of the cuboid.

..... cm^3 [1]

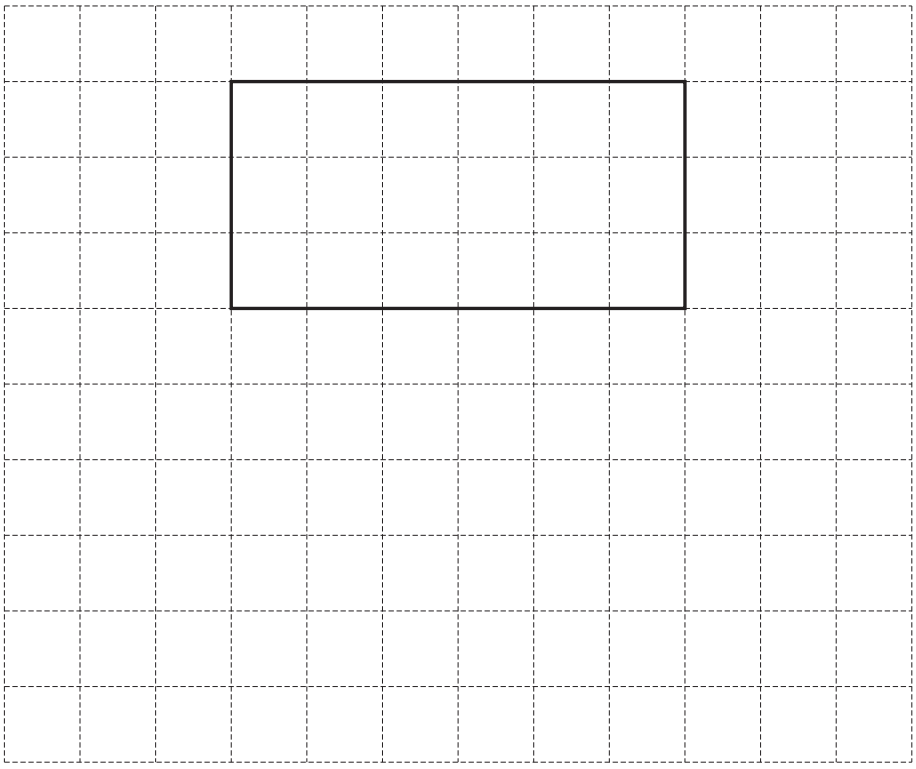
(b) A cereal bar is in a box.
The box is a cuboid measuring 6 cm by 3 cm by 1 cm.

View solution



NOT TO SCALE

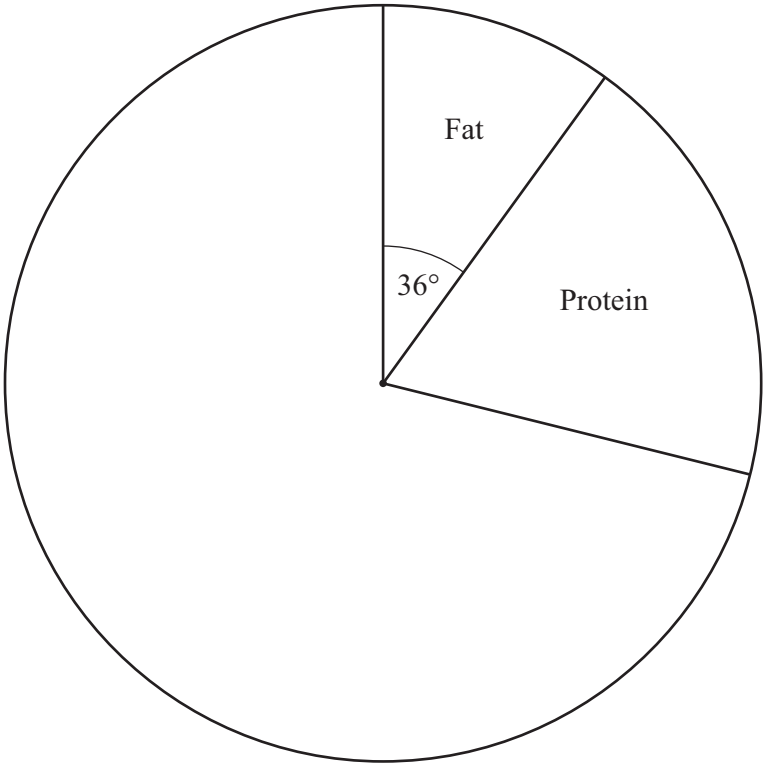
On the 1 cm^2 grid, complete a net of the cuboid.
One face has been drawn for you.



[3]

(c) The cereal contains fat, protein, carbohydrate and fibre.
The pie chart shows the information about the masses of fat and protein.

View solution



(i) Work out the percentage of the mass of the cereal that is fat.

..... % [1]

(ii) 60% of the mass of the cereal is carbohydrate.

Complete the pie chart.

View solution

[2]

(iii) Work out the mass of protein in 30 g of the cereal.

View solution

..... g [2]

2 **(a)** Write the number 845 024 in words.

View solution

..... [1]

(b) Write these numbers in order, starting with the smallest.

View solution

$\frac{7}{18}$ 39% $\frac{15}{40}$ 0.388

..... < ..... < ..... < ..... [2]

smallest

(c) Find the value of

View solution

(i) 4^5

..... [1]

(ii) 6^0

View solution

..... [1]

(iii) $\sqrt{16} \times \sqrt{49}$.

View solution

..... [1]

(d) Solve.

$6x + 5 = 29$

View solution

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

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

$$\frac{2.7 \times 42.4}{8.6 - 4.3}.$$

View solution

You must show all your working.

..... [2]

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(f) $3^5 \times 3^x = 3^{20}$

View solution

Find the value of x.

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

(g) Simplify $(x^4)^3$.

View solution

..... [1]

(h) A boat to town A leaves a port every 16 minutes.
A boat to town B leaves the same port every 34 minutes.
Both boats leave the port at 07 30.

View solution

Work out the next time both boats leave the port together.

..... [3]

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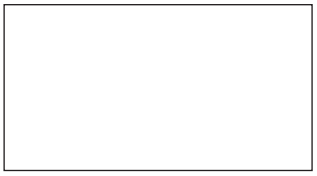
3 **(a)**



View solution

A wedding invitation is in the shape of a rectangle.

Draw the lines of symmetry on this rectangle. [2]

(b) There are 98 adults and 56 children at the wedding.

View solution

Find the fraction of people who are children.
Give your fraction in its simplest form.

..... [2]

(c) The wedding meal starts at 13 15 and lasts for 2 hours 50 minutes.

View solution

Find the time the meal ends.

..... [1]

(d) The probability that it will rain at the wedding is 0.12 .

View solution

Find the probability that it will not rain.

..... [1]

(e) **(i)** These are the ages of the staff at the wedding.

View solution

16 24 39 28 17 48 31 33 17 29 40 25

Complete the stem-and-leaf diagram.

1	
2	
3	
4	

Key: 1|6 represents 16

[2]

(ii) Find the range.

View solution

..... [1]

4 **(a)** $n = 15r + 20c$

View solution

Find the value of r when $n = 180$ and $c = 3$.

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

(b) Factorise completely.

$$20p^2q - 5p$$

View solution

..... [2]

(c) Apples cost 35 cents each and bananas cost 14 cents each.

View solution

Write down an expression for the total cost, in cents, of x apples and y bananas.

..... cents [2]

(d) Solve the simultaneous equations.
You must show all your working.

View solution

$$8x + 3y = 59$$
$$5x + 7y = 83$$

$x =$ .....

$y =$ ..... [4]

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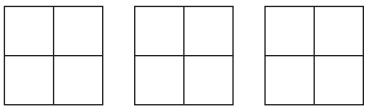
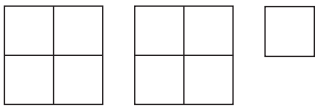
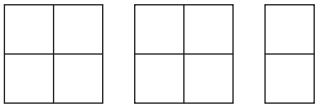
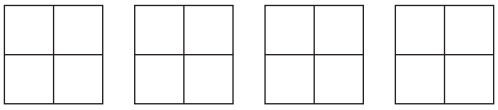
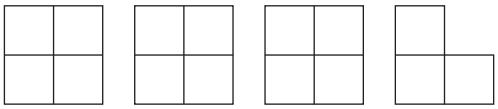
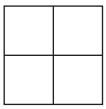
5 **(a)** Kurt owns some toy cars of different colours.
The pictogram shows the number of each colour.

View solution

Colour	Number of toy cars
Red	
Yellow	
Green	
Blue	
White	
Other	

Key:  = 8 cars

(i) Write down the colour of toy car that Kurt owns most of.

..... [1]

(ii) Find the number of yellow toy cars that Kurt owns.

View solution

..... [1]

(iii) Find how many more red toy cars than white toy cars Kurt owns.

View solution

..... [1]

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(b) A toy car costs \$12.40 in the USA and 11.50 euros in Spain.
The exchange rate is 1 euro = \$1.12 .

View solution

Calculate the difference in the cost of the toy car in euros.
Give your answer correct to 2 decimal places.

..... euros [3]

(c) Leo owns some toy vehicles.
He owns 57 cars, 12 bicycles and 42 trucks.

View solution

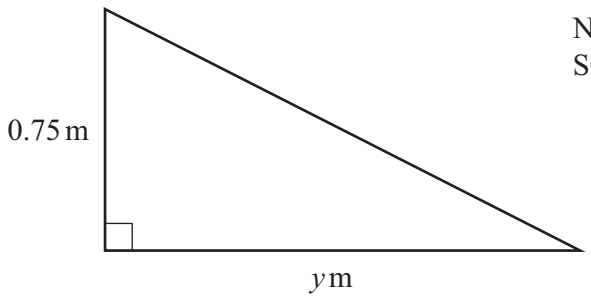
Find the ratio of the number of cars : bicycles : trucks in its simplest form.

..... : ..... : ..... [2]

(d) Leo keeps his toy vehicles on a shelf.

View solution

(i) The shelf is in the shape of a right-angled triangle.



The area of the shelf is 0.3 m^2.

Calculate the value of y.

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

(ii) The shelf is 1.35 metres from the floor.

View solution

Change 1.35 metres into centimetres.

..... cm [1]

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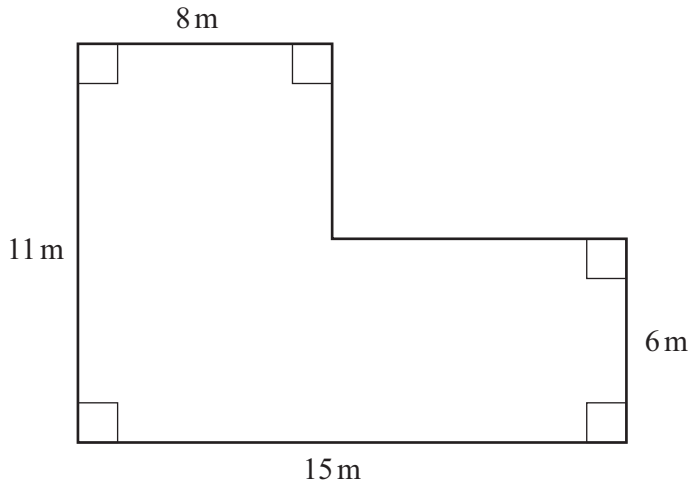
6 (a)



NOT TO SCALE

The diagram shows a plan of Zak's garden.

Find the perimeter of the garden.

..... m [2]

(b) Zak records the temperature in his garden each night for one week.

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
4 °C	1 °C	−2 °C	2 °C	−5 °C	3 °C	−4 °C

(i) Which night was coldest?

..... [1]

(ii) Find the difference in temperature between Friday night and Saturday night.

..... °C [1]

(c) Zak buys pea plants, bean plants and sunflower plants in the ratio peas : beans : sunflowers = 7 : 5 : 2.
He buys 45 bean plants.

Show that the total number of plants he buys is 126.

[2]

(d) Zak has a water barrel.
On Monday the barrel contains 120 litres of water.
On Friday the barrel contains 43.2 litres of water.

View solution

Calculate the percentage decrease of the water in the barrel.

..... % [2]

(e) Zak drives to a shop.

View solution

The journey takes $1\frac{1}{4}$ hours.

He drives at an average speed of 57 km/h.

Calculate the distance he drives.

..... km [2]

(f)

View solution

Machine hire charges
1st day $22.60
Each additional day $11.80

Zak pays $69.80 to hire a machine.

Calculate the number of days he hires it for.

..... days [3]

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7 **(a)**



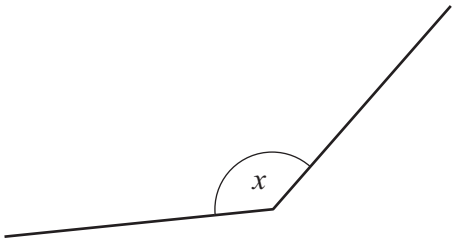
View solution

Write down the mathematical name for this solid.

..... [1]

(b)

View solution



(i) Measure the size of angle x.

..... [1]

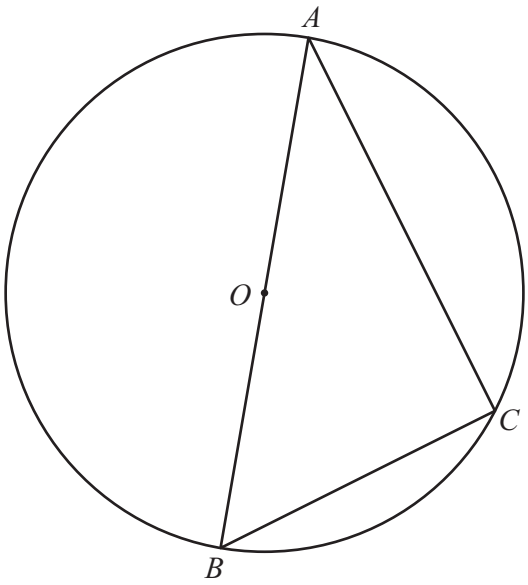
(ii) Write down the mathematical name for this type of angle.

View solution

..... [1]

(c)

View solution



NOT TO SCALE

Points A, B and C lie on the circle, centre O.
$AB = 11\,\text{cm}$ and $BC = 5\,\text{cm}$.

(i) Give a geometrical reason why angle ACB is 90°.

..... [1]

(ii) Calculate the circumference of the circle.

View solution

..... cm [2]

(iii) Show that AC is 9.8 cm, correct to 2 significant figures.

View solution

[3]

(d) The surface area of a sphere is 250 cm^2.

View solution

Calculate the radius of the sphere.
[The surface area, A, of a sphere with radius r is $A = 4\pi r^2$.]

..... cm [3]

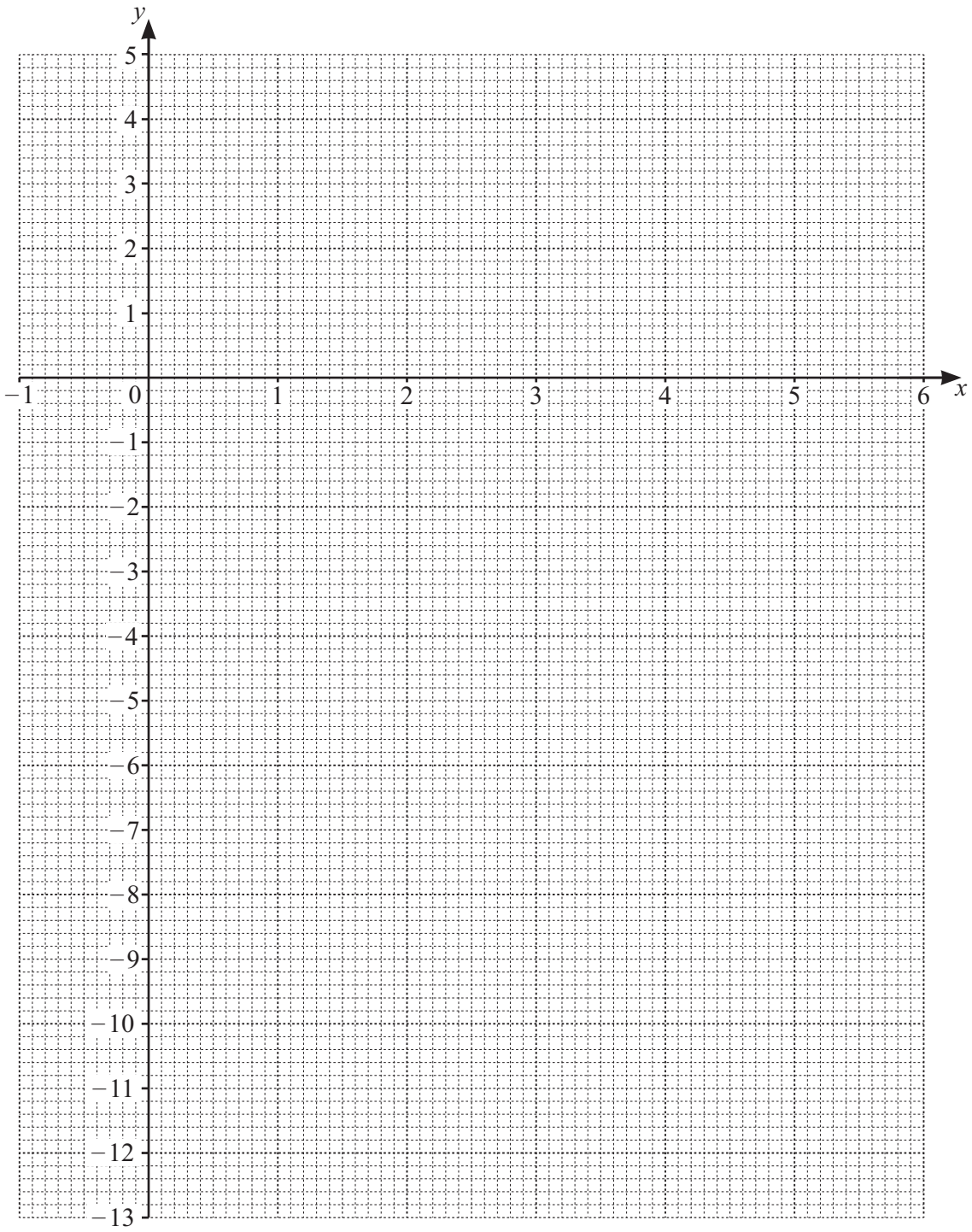
8 **(a)** **(i)** Complete the table of values for $y = 4x - x^2$.

View solution

x	-1	0	1	2	3	4	5	6
y	-5	0	3	4	3		-5	

[2]

(ii) On the grid, draw the graph of $y = 4x - x^2$ for $-1 \leqslant x \leqslant 6$.



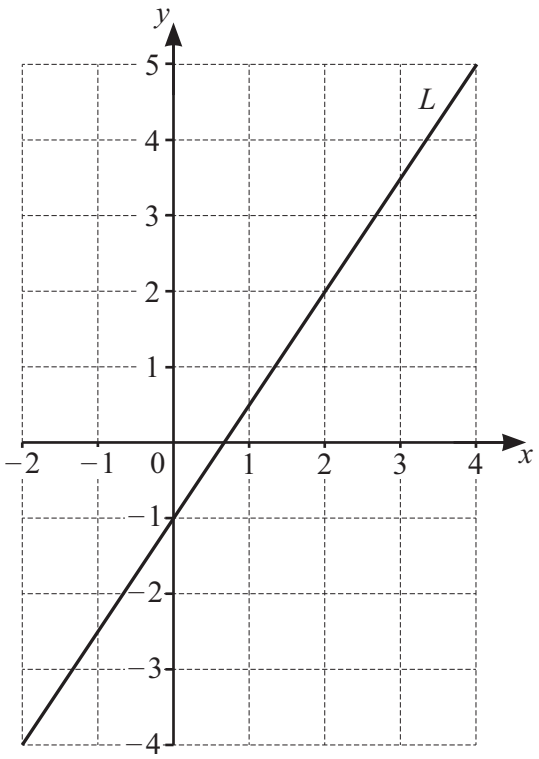
[4]

(iii) Use your graph to solve the equation $4x - x^2 = 1$.

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

View solution

(b) The line L is shown on the grid.

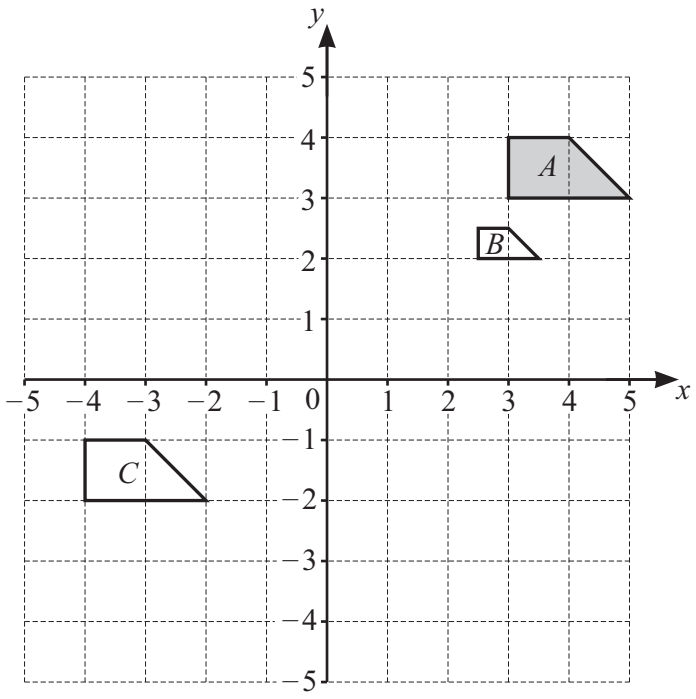


Find the equation of line L.

..... [3]

Question 9 is printed on the next page.

9 Shapes A, B and C are shown on the grid.



(a) Write down the mathematical name of shape A.

View solution

..... [1]

(b) Describe fully the **single** transformation that maps shape A onto shape B.

View solution

.....

..... [3]

(c) Describe fully the **single** transformation that maps shape A onto shape C.

View solution

.....

..... [2]

(d) Draw the image of shape A after a rotation, 90° clockwise, centre $(0, 0)$.

View solution [2]

(e) Draw the image of shape A after a reflection in the line $x = 1$. [2]

View solution

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