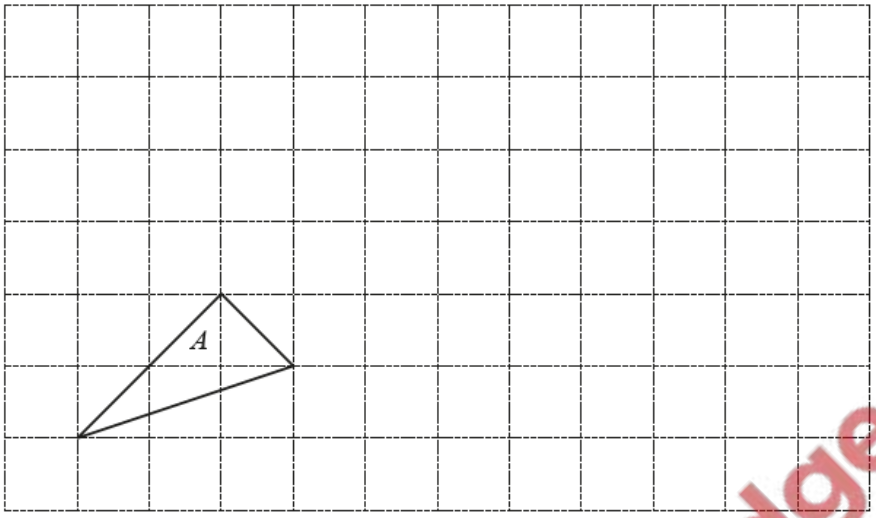
Vectors and transformations – 2022 IGCSE 0580

1. June/2022/Paper_12/No.3

On the grid, draw a triangle that is congruent to triangle A.



[1]

2. June/2022/Paper_12/No.10

$$\mathbf{p} = \begin{pmatrix} 2 \\ 8 \end{pmatrix} \qquad \mathbf{q} = \begin{pmatrix} -1 \\ 4 \end{pmatrix}$$

Find

(a) $\mathbf{p} - \mathbf{q}$.

( ) [1]

(b) $6\mathbf{p}$.

( ) [1]

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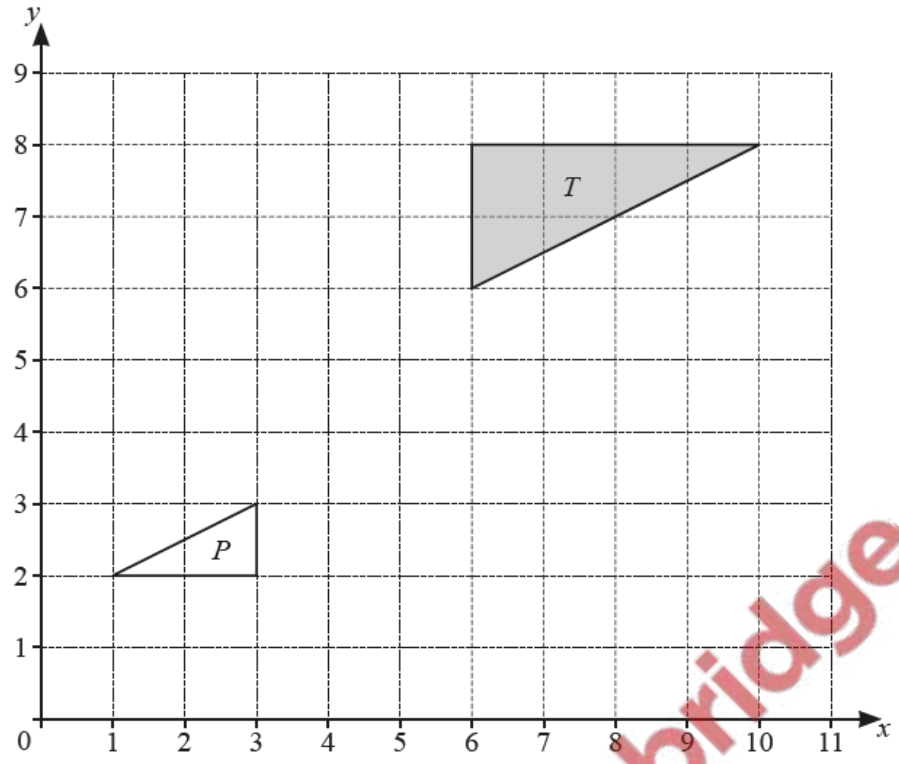
3. June/2022/Paper_21/No.16



Describe fully the **single** transformation that maps triangle T onto triangle P.

.....

..... [3]

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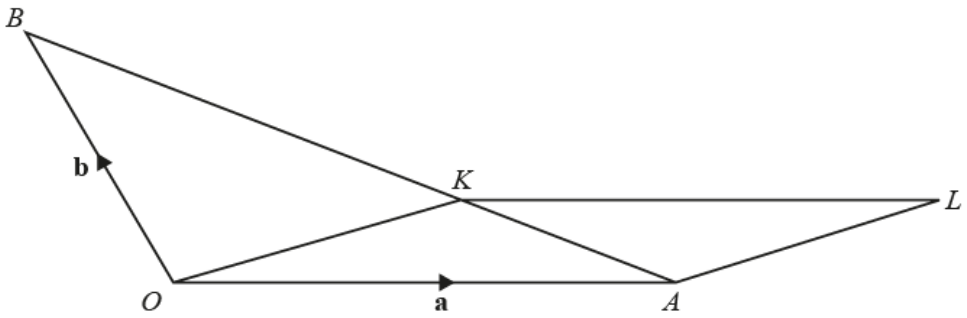
4. June/2022/Paper_21/No.26



NOT TO SCALE

The diagram shows a triangle OAB and a parallelogram $OALK$.
The position vector of A is **a** and the position vector of B is **b**.
K is a point on AB so that $AK : KB = 1 : 2$.

Find the position vector of L, in terms of **a** and **b**.
Give your answer in its simplest form.

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..... [4]

5. June/2022/Paper_22/No.10

$$\mathbf{p} = \begin{pmatrix} 2 \\ 8 \end{pmatrix} \qquad \mathbf{q} = \begin{pmatrix} -1 \\ 4 \end{pmatrix}$$

(a) Find

(i) $\mathbf{p} - \mathbf{q}$,

$\begin{pmatrix} \quad \\ \quad \end{pmatrix}$ [1]

(ii) $6\mathbf{p}$.

$\begin{pmatrix} \quad \\ \quad \end{pmatrix}$ [1]

(b) Find $|\mathbf{p} - \mathbf{q}|$.

..... [2]

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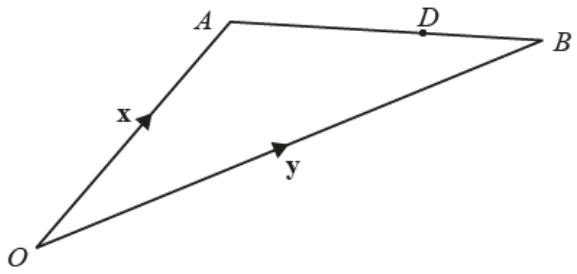
6. June/2022/Paper_22/No.22



NOT TO SCALE

$\overrightarrow{OA} = \mathbf{x}$, $\overrightarrow{OB} = \mathbf{y}$ and $\overrightarrow{OD} = \frac{3}{7}\mathbf{x} + \frac{4}{7}\mathbf{y}$.

Calculate the ratio $AD : DB$.

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

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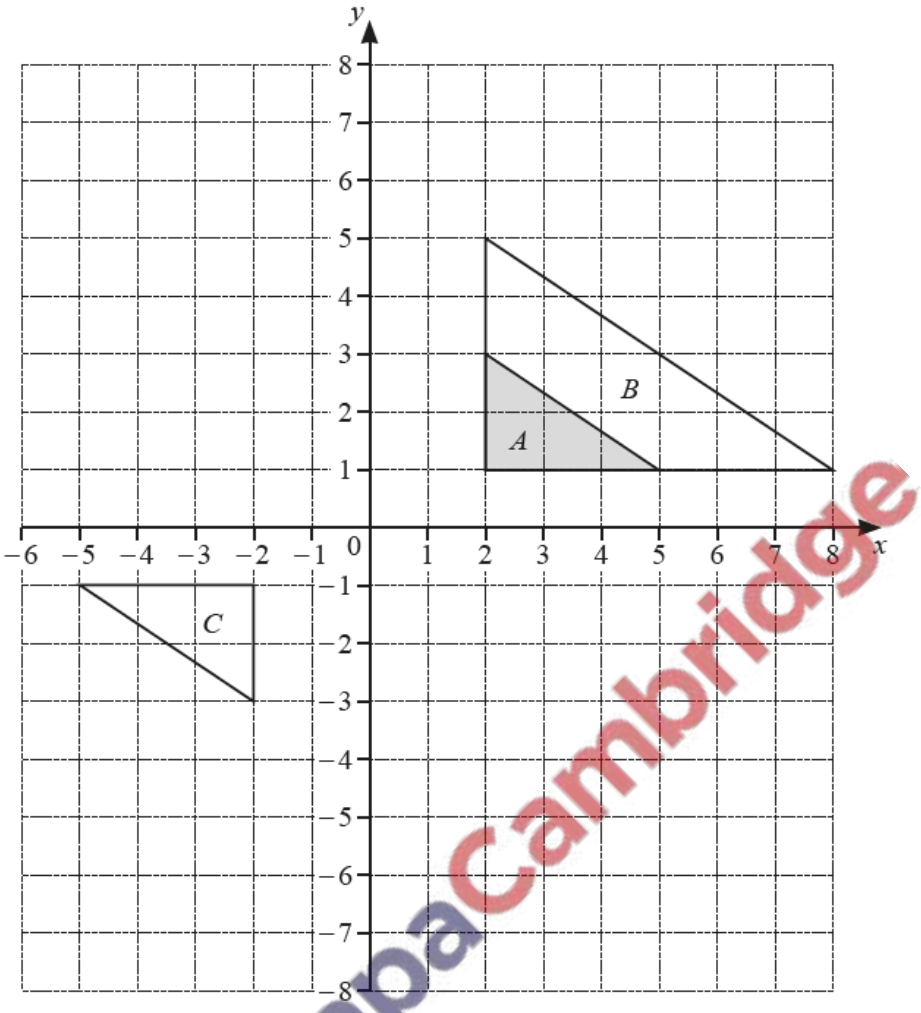
7. June/2022/Paper_31/No.5(c)

(c) The grid shows triangles A, B and C.



(i) Describe fully the **single** transformation that maps triangle A onto triangle B.

.....

..... [3]

(ii) Describe fully the **single** transformation that maps triangle A onto triangle C.

.....

..... [3]

(iii) Draw the image of

(a) triangle A after a translation by the vector $\begin{pmatrix} -5 \\ 3 \end{pmatrix}$, [2]

(b) triangle A after a reflection in the line $y = -2$. [2]

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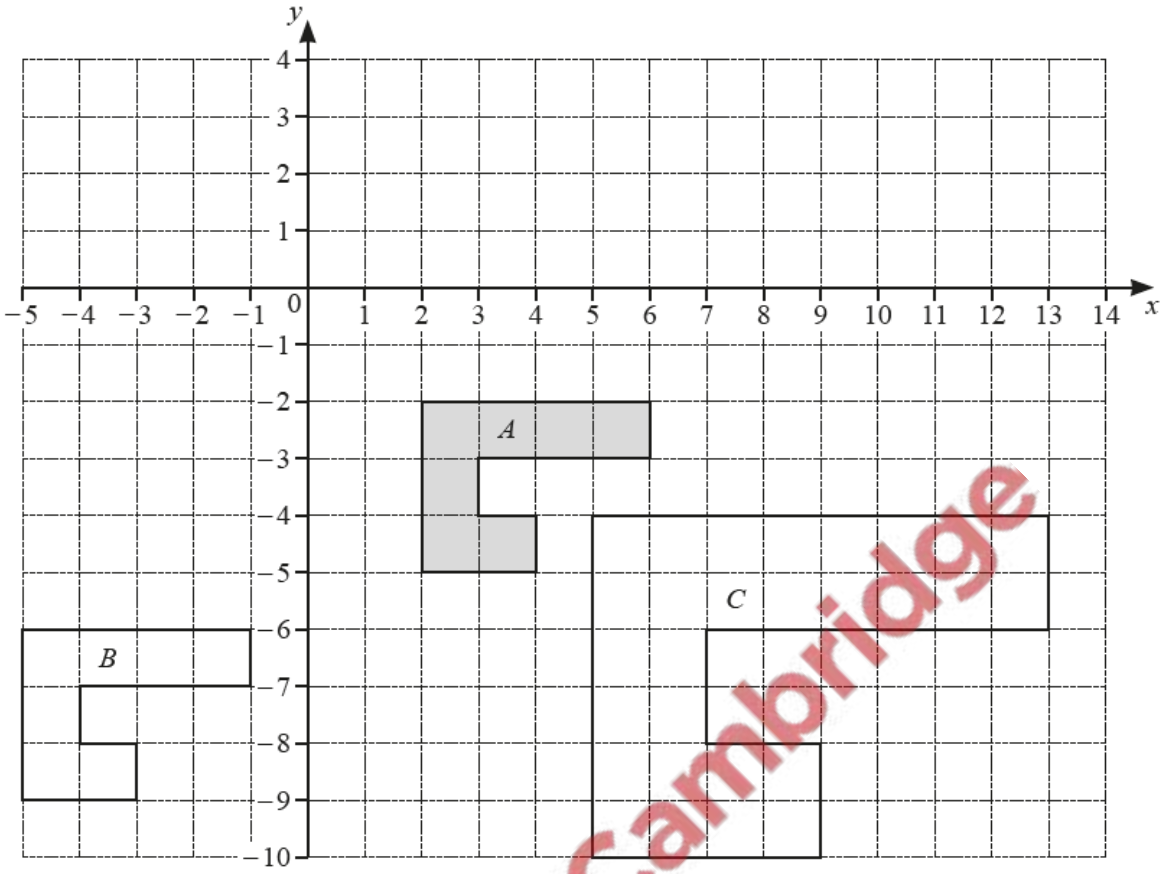
8. June/2022/Paper_32/No.9

The grid shows three shapes, A, B and C.



(a) Describe fully the **single** transformation that maps

(i) shape A onto shape B,

.....

..... [2]

(ii) shape A onto shape C.

.....

..... [3]

(b) On the grid, draw the image of shape A after a rotation, 90° clockwise, centre (6, −3). [2]

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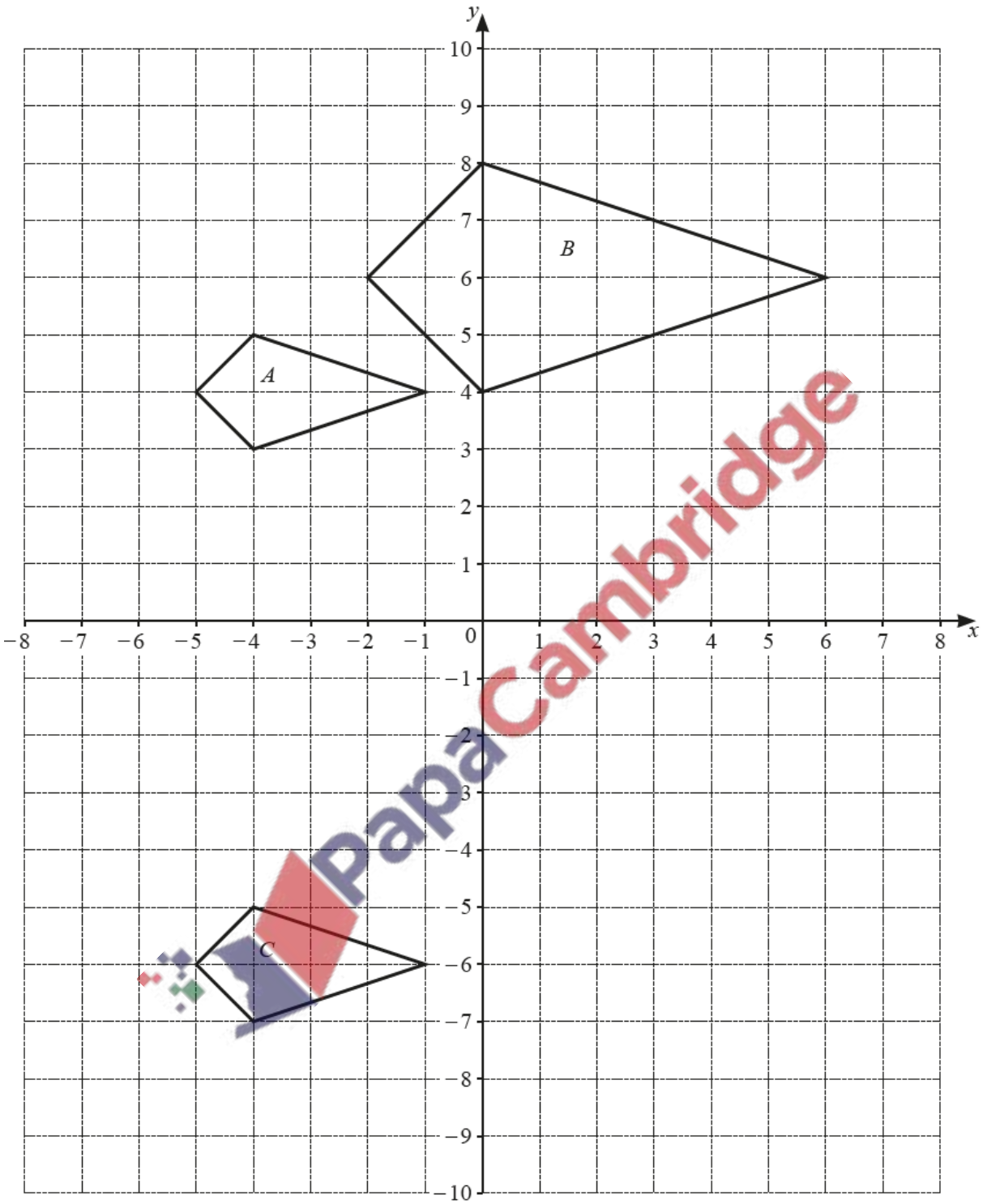
9. June/2022/Paper_33/No.1

The diagram shows three quadrilaterals on a 1 cm^2 grid.



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

..... [1]

(b) Find the area of quadrilateral A.

..... cm^2 [1]

(c) Describe fully the **single** transformation that maps quadrilateral A onto

(i) quadrilateral B,

.....

..... [3]

(ii) quadrilateral C.

.....

..... [2]

(d) On the grid, draw the image of

(i) quadrilateral C after a 90° anticlockwise rotation about the origin, [2]

(ii) quadrilateral C after a reflection in the line $x = 1$. [2]

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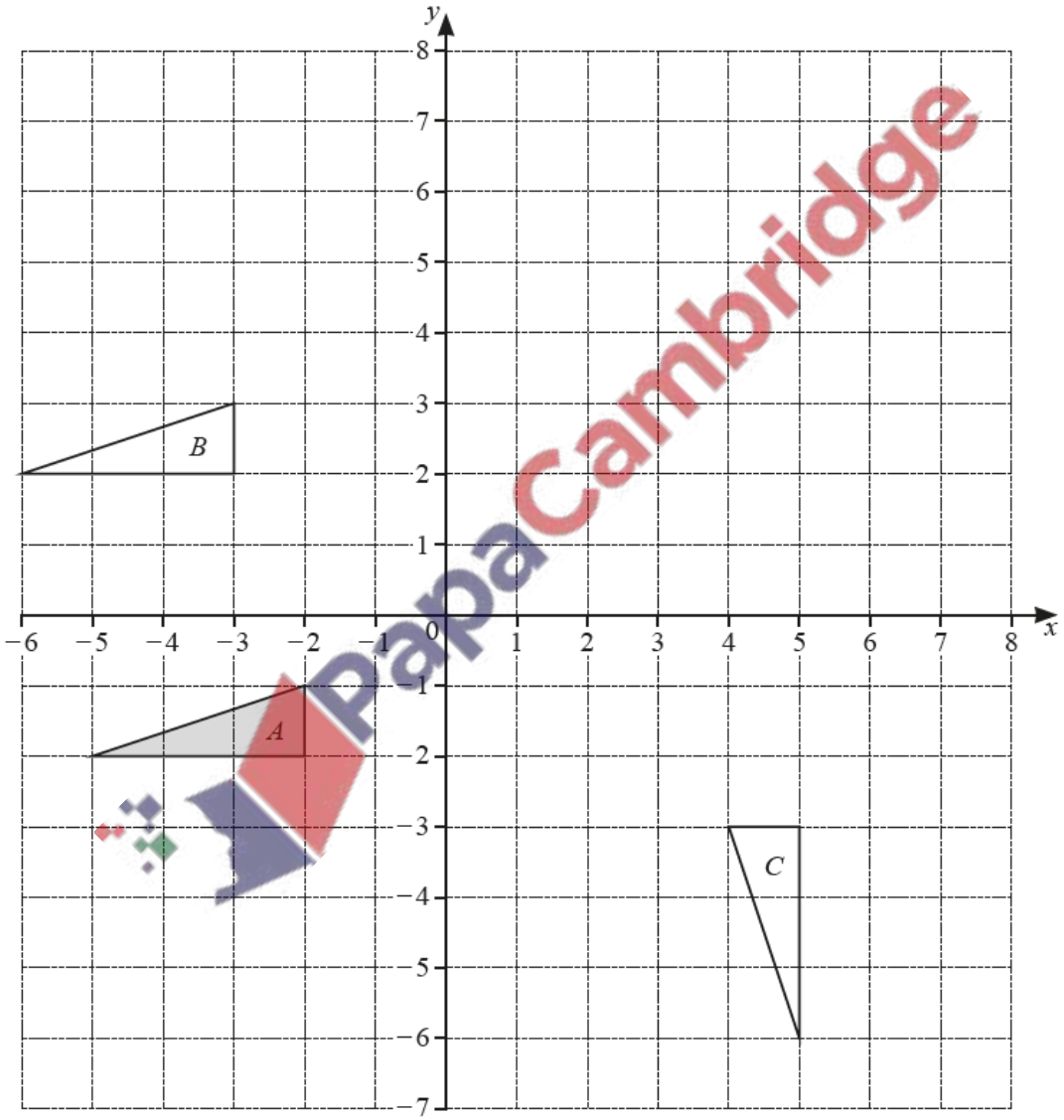
10. June/2022/Paper_42/No.5

(a) Draw the lines of symmetry of the rectangle.

[2]

(b)



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(i) Describe fully the **single** transformation that maps

(a) triangle A onto triangle B,

.....

..... [2]

(b) triangle A onto triangle C.

.....

..... [3]

(ii) **(a)** Draw the image of triangle A after reflection in $y = 2$. [2]

(b) Draw the image of triangle A after enlargement by scale factor -2, centre $(-1, 1)$. [2]

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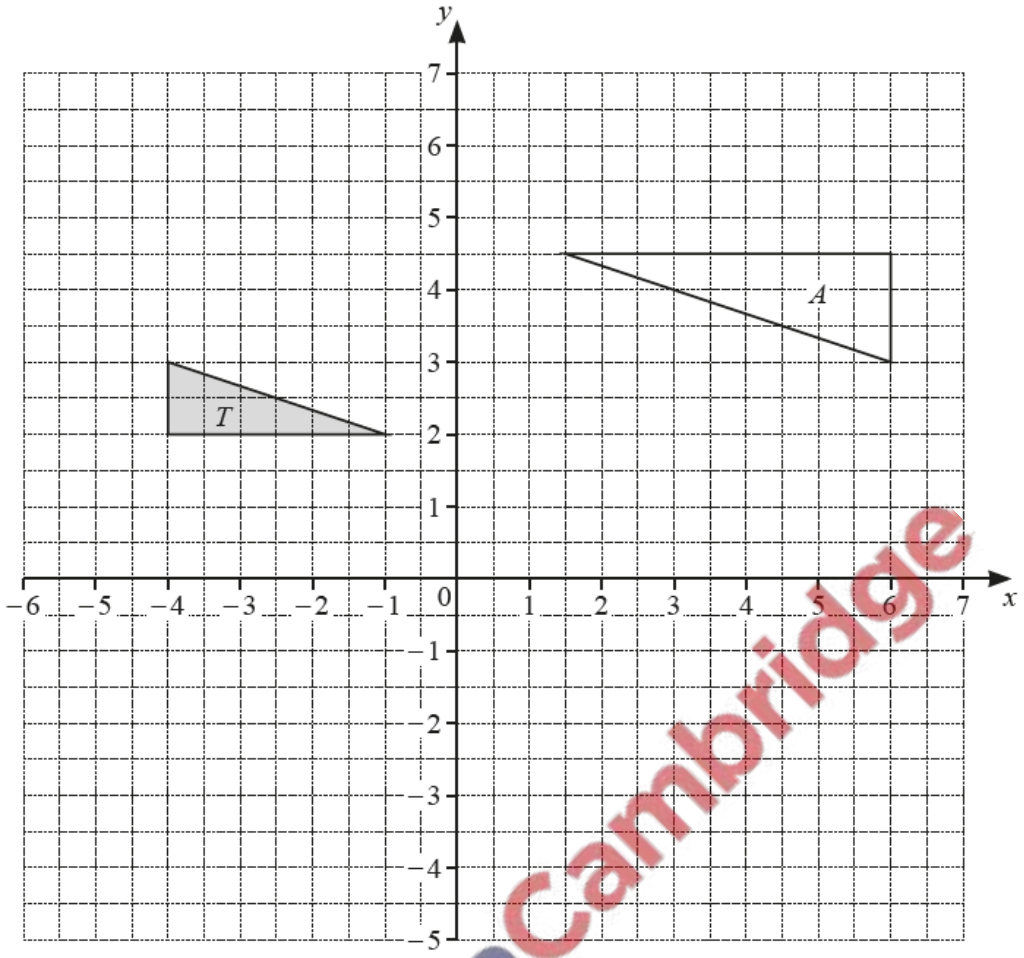
11. June/2022/Paper_43/No.2

(a)



(i) Draw the image of triangle T after a reflection in the line $y = x$. [2]

(ii) Draw the image of triangle T after a translation by the vector $\begin{pmatrix} -1 \\ 3 \end{pmatrix}$. [2]

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

.....

..... [3]

(b) A quadrilateral P is enlarged by a scale factor of 1.2 to give quadrilateral Q.
The area of quadrilateral P is $20\,\text{cm}^2$.

Calculate the area of quadrilateral Q.

..... cm^2 [2]

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