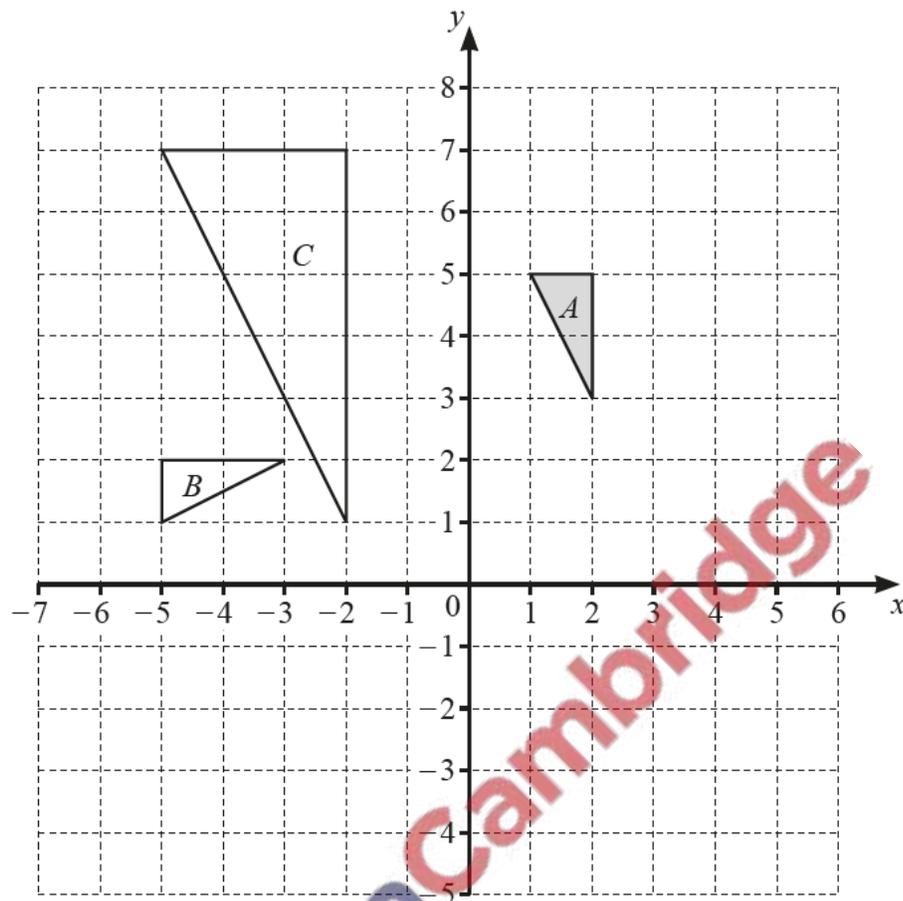


1. Nov/2020/Paper_33/No.6

(a)



(i) On the grid, draw the image of

(a) triangle *A* after a translation by the vector $\begin{pmatrix} 3 \\ -7 \end{pmatrix}$, [2]

(b) triangle *A* after a reflection in the line $x = 3$. [2]

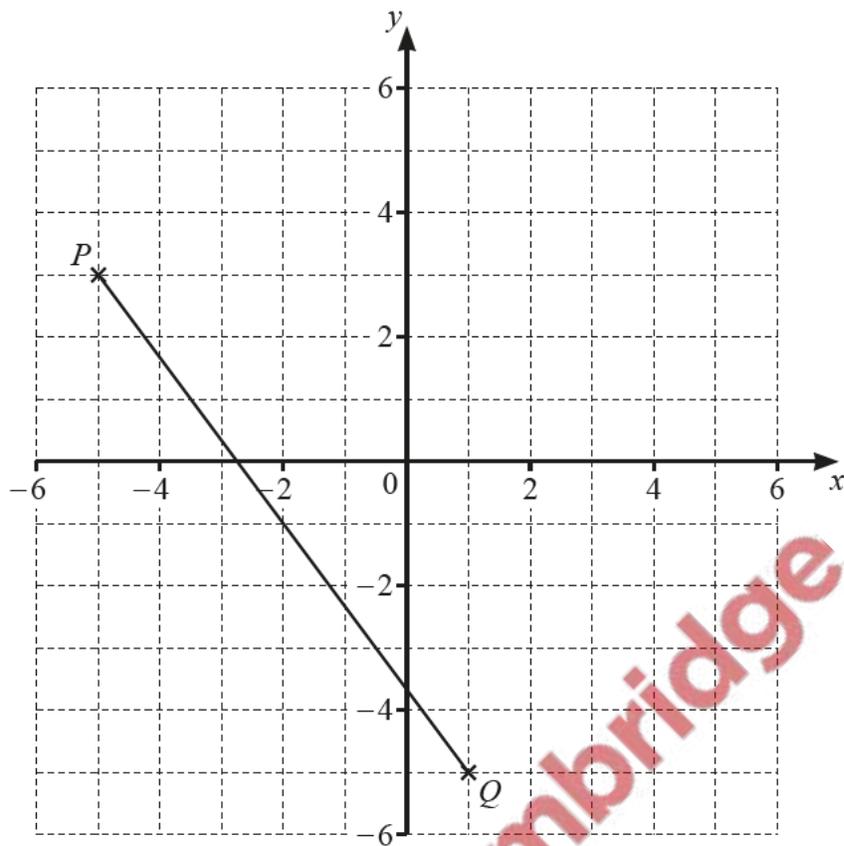
(ii) Describe fully the **single** transformation that maps triangle *A* onto triangle *B*.

..... [3]

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

..... [3]

(b)



(i) Write down the coordinates of the midpoint of the line PQ .

(..... ,) [1]

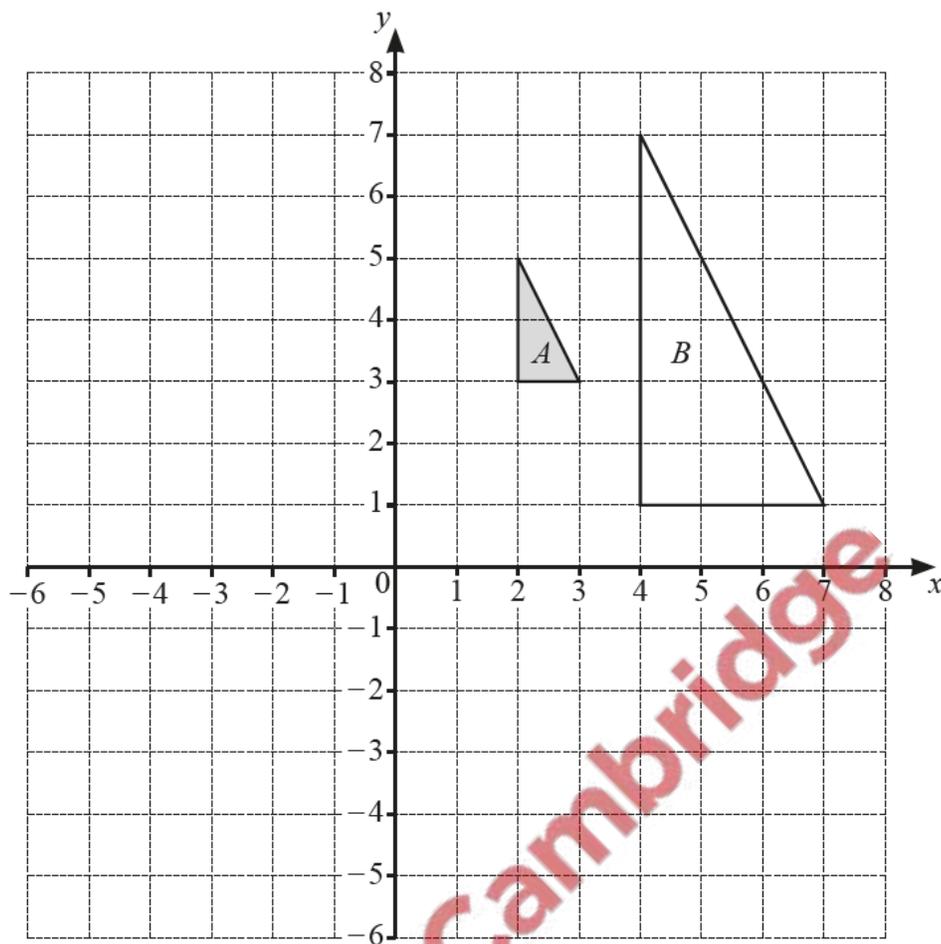
(ii) Find the vector \overrightarrow{QP} .

$\overrightarrow{QP} = \begin{pmatrix} \\ \end{pmatrix}$ [2]

(iii) Point R has coordinates $(6, -2)$ and $\overrightarrow{RS} = \begin{pmatrix} -4 \\ 5 \end{pmatrix}$.

Find the coordinates of point S .

(..... ,) [1]



(a) On the grid, draw the image of

(i) triangle A after a rotation of 90° counter-clockwise about $(0, 0)$, [2]

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

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

.....

..... [3]

3. Nov/2020/Paper_43/No.9

(a) $\vec{AB} = \begin{pmatrix} 6 \\ -1 \end{pmatrix}$ $\vec{BC} = \begin{pmatrix} -2 \\ 5 \end{pmatrix}$ $\vec{DC} = \begin{pmatrix} 2 \\ -3 \end{pmatrix}$

Find

(i) \vec{AC} ,

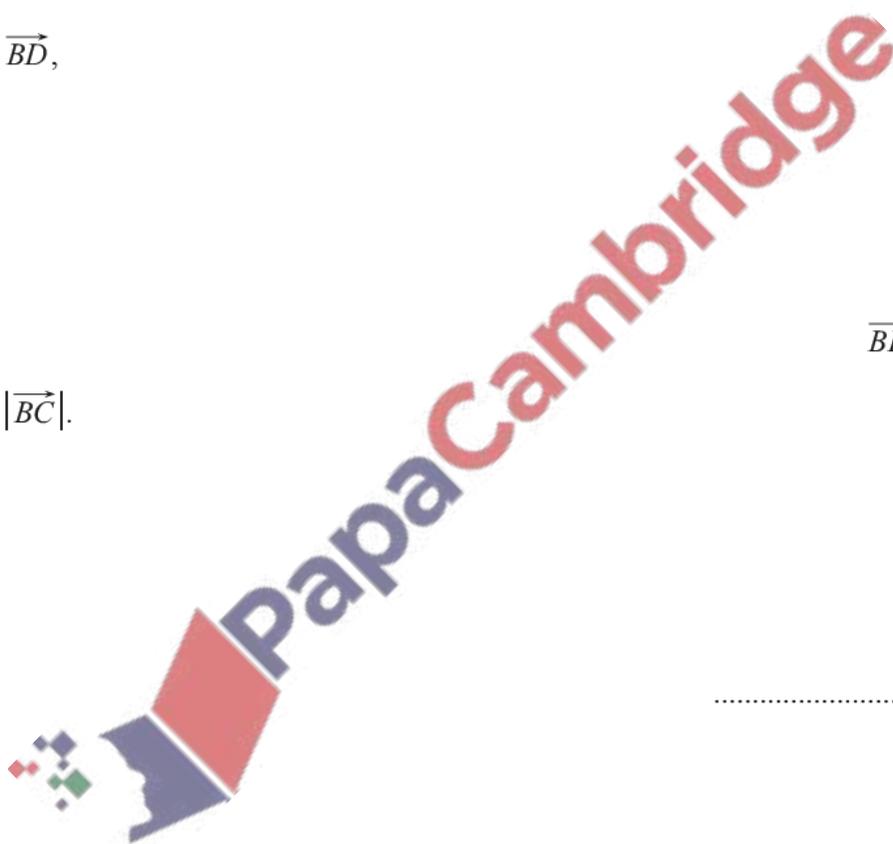
(ii) \vec{BD} ,

(iii) $|\vec{BC}|$.

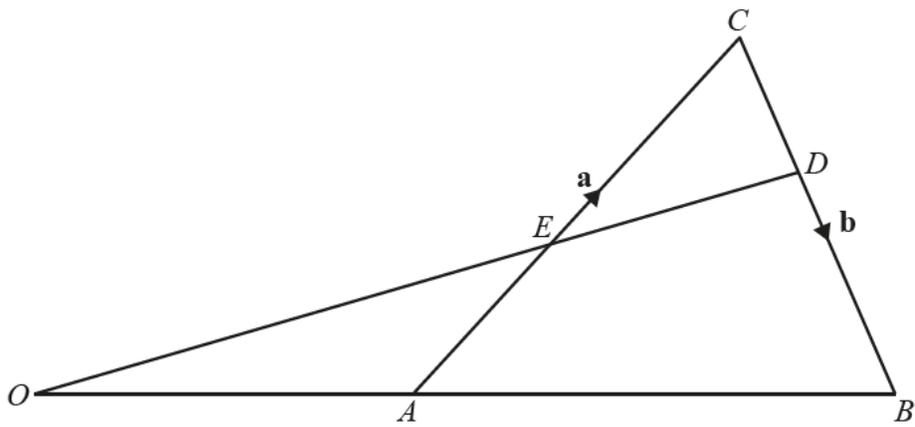
$\vec{AC} = \begin{pmatrix} \quad \\ \quad \end{pmatrix}$ [2]

$\vec{BD} = \begin{pmatrix} \quad \\ \quad \end{pmatrix}$ [2]

..... [2]



(b)



NOT TO SCALE

In the diagram, OAB and OED are straight lines.

O is the origin, A is the midpoint of OB and E is the midpoint of OC .

$\vec{AC} = \mathbf{a}$ and $\vec{CB} = \mathbf{b}$.

Find, in terms of \mathbf{a} and \mathbf{b} , in its simplest form

(i) \vec{AB} ,

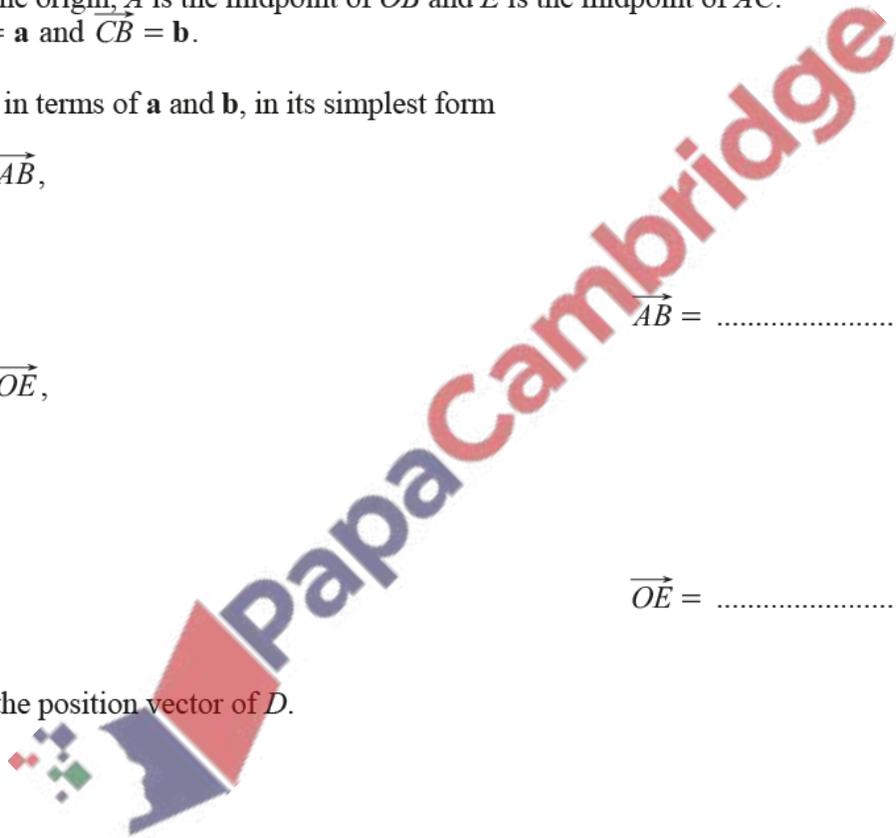
$\vec{AB} = \dots\dots\dots$ [1]

(ii) \vec{OE} ,

$\vec{OE} = \dots\dots\dots$ [2]

(iii) the position vector of D .

$\dots\dots\dots$ [3]



(a) (i) $\mathbf{m} = \begin{pmatrix} 5 \\ 7 \end{pmatrix}$

Find $3\mathbf{m}$.

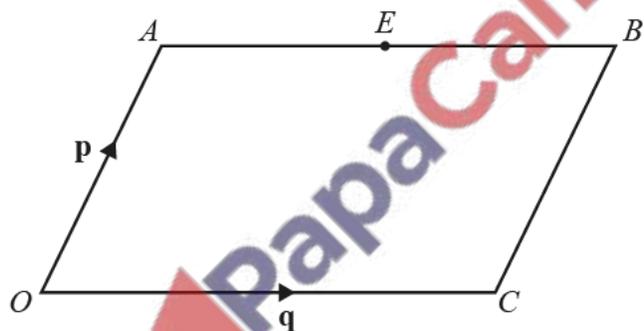
$\begin{pmatrix} \\ \end{pmatrix}$ [1]

(ii) The magnitude of the vector $\begin{pmatrix} p \\ 12 \end{pmatrix}$ is 13.

Find the positive value of p .

$p = \dots\dots\dots$ [2]

(b)



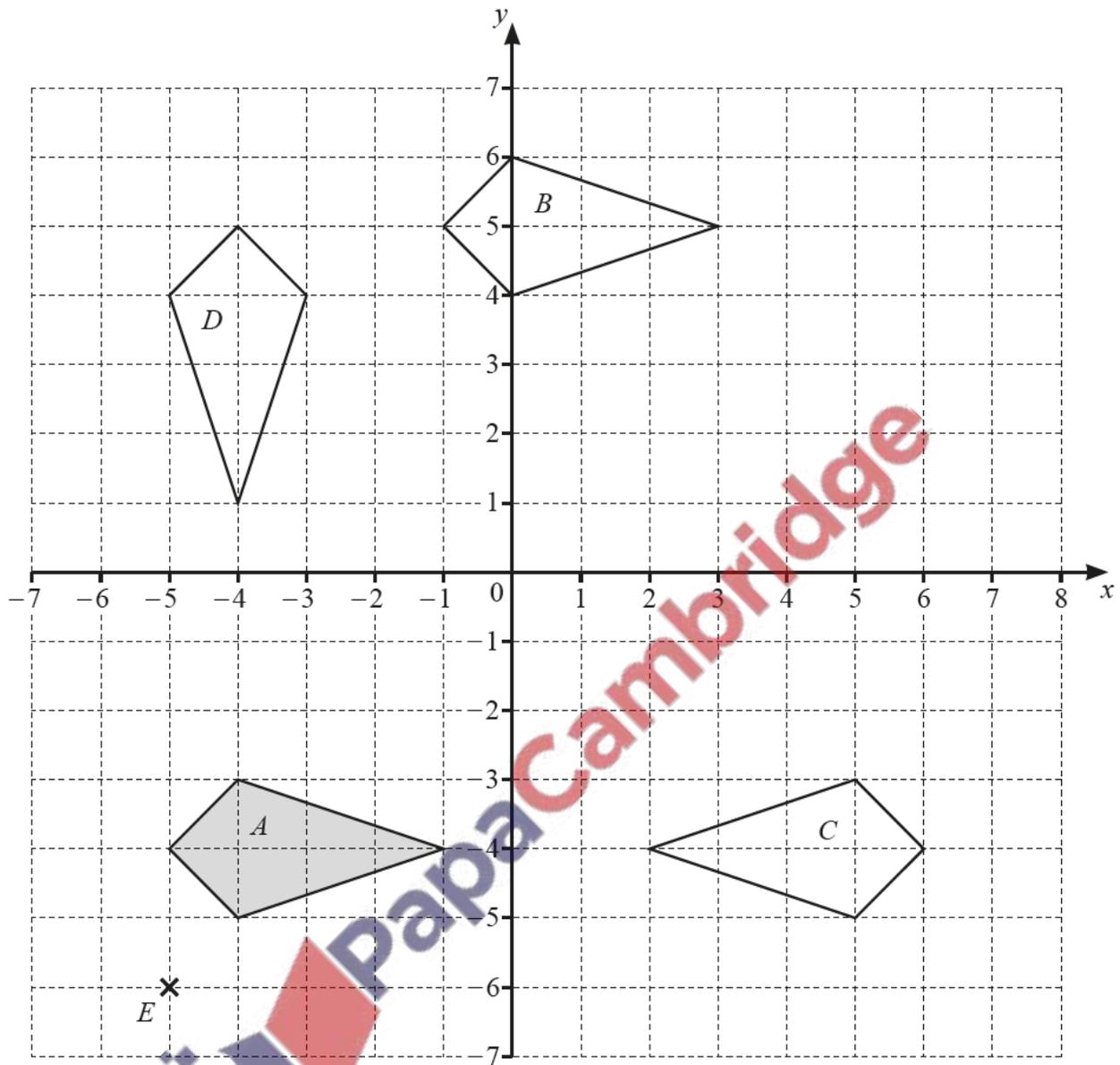
NOT TO SCALE

$OABC$ is a parallelogram.
 $\vec{OA} = \mathbf{p}$ and $\vec{OC} = \mathbf{q}$.
 E is the midpoint of AB .

Find \vec{OE} in terms of \mathbf{p} and \mathbf{q} .

$\vec{OE} = \dots\dots\dots$ [2]

The grid shows a point E and four quadrilaterals, A , B , C , and D .



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

..... [1]

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

(i) shape A onto shape B ,

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

(ii) shape A onto shape C ,

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

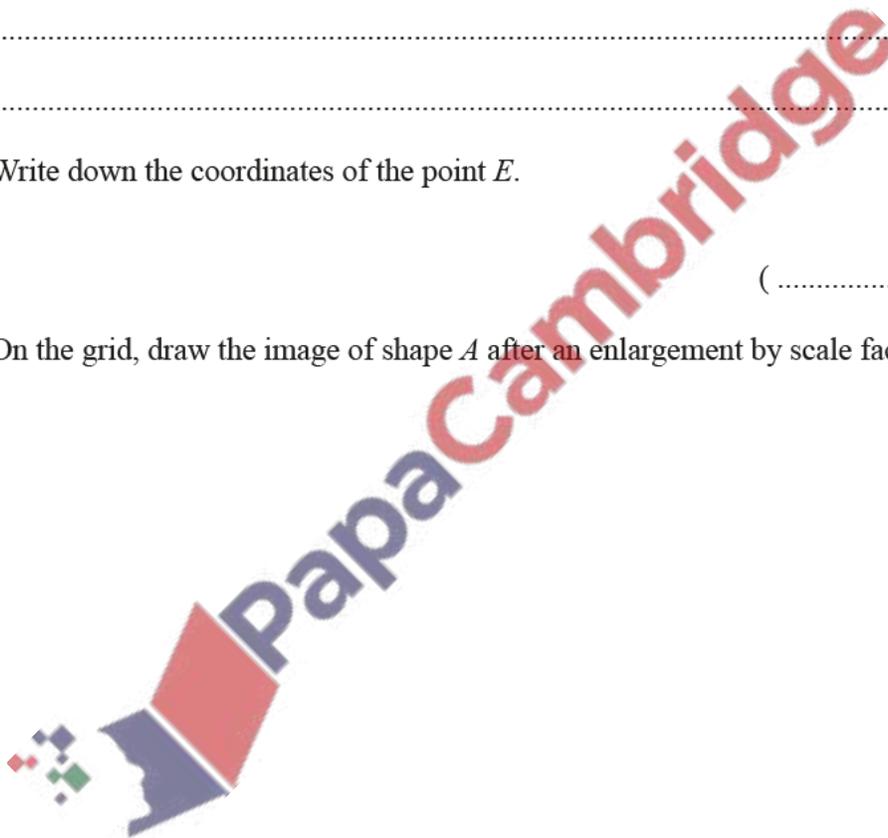
(iii) shape A onto shape D .

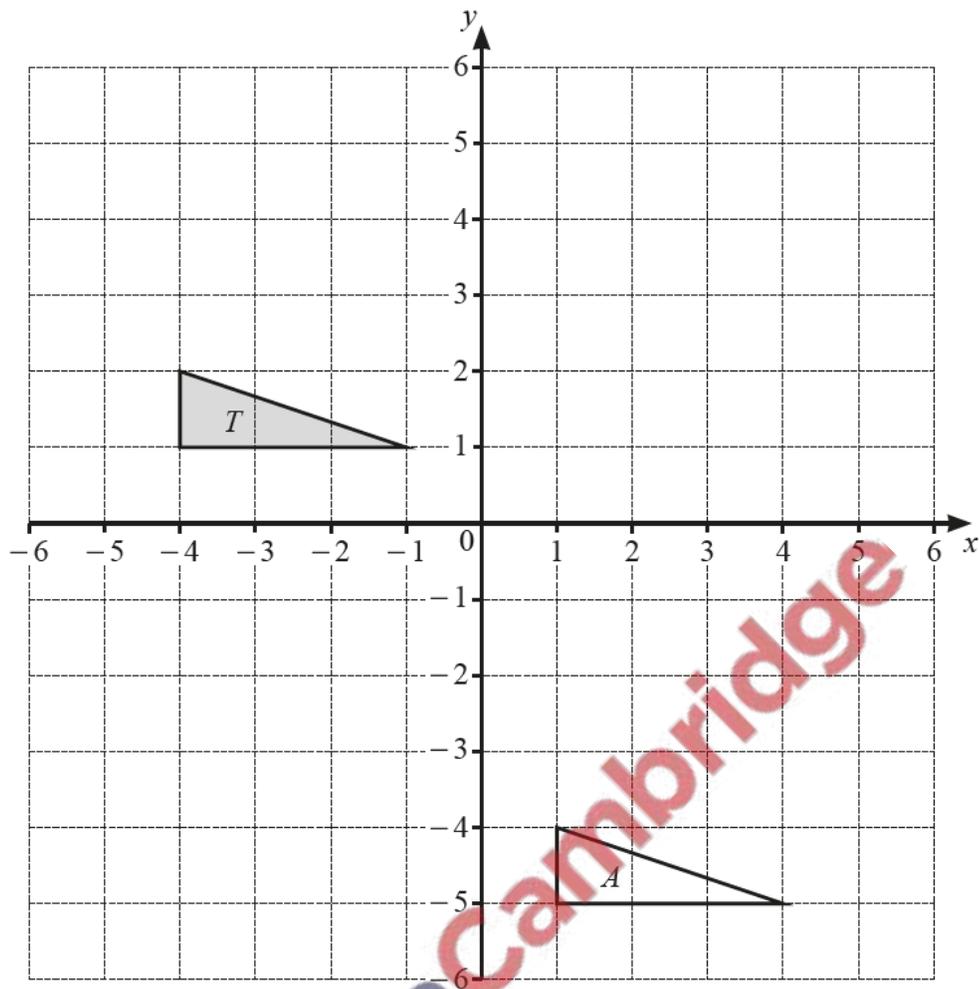
.....
..... [3]

(c) (i) Write down the coordinates of the point E .

(..... ,) [1]

(ii) On the grid, draw the image of shape A after an enlargement by scale factor 3, center E . [2]





- (a) Draw the image of triangle T after a reflection in the line $y = -1$. [2]
- (b) Draw the image of triangle T after a rotation through 90° clockwise about $(0, 0)$. [2]
- (c) Describe fully the **single** transformation that maps triangle T onto triangle A .

.....

..... [2]