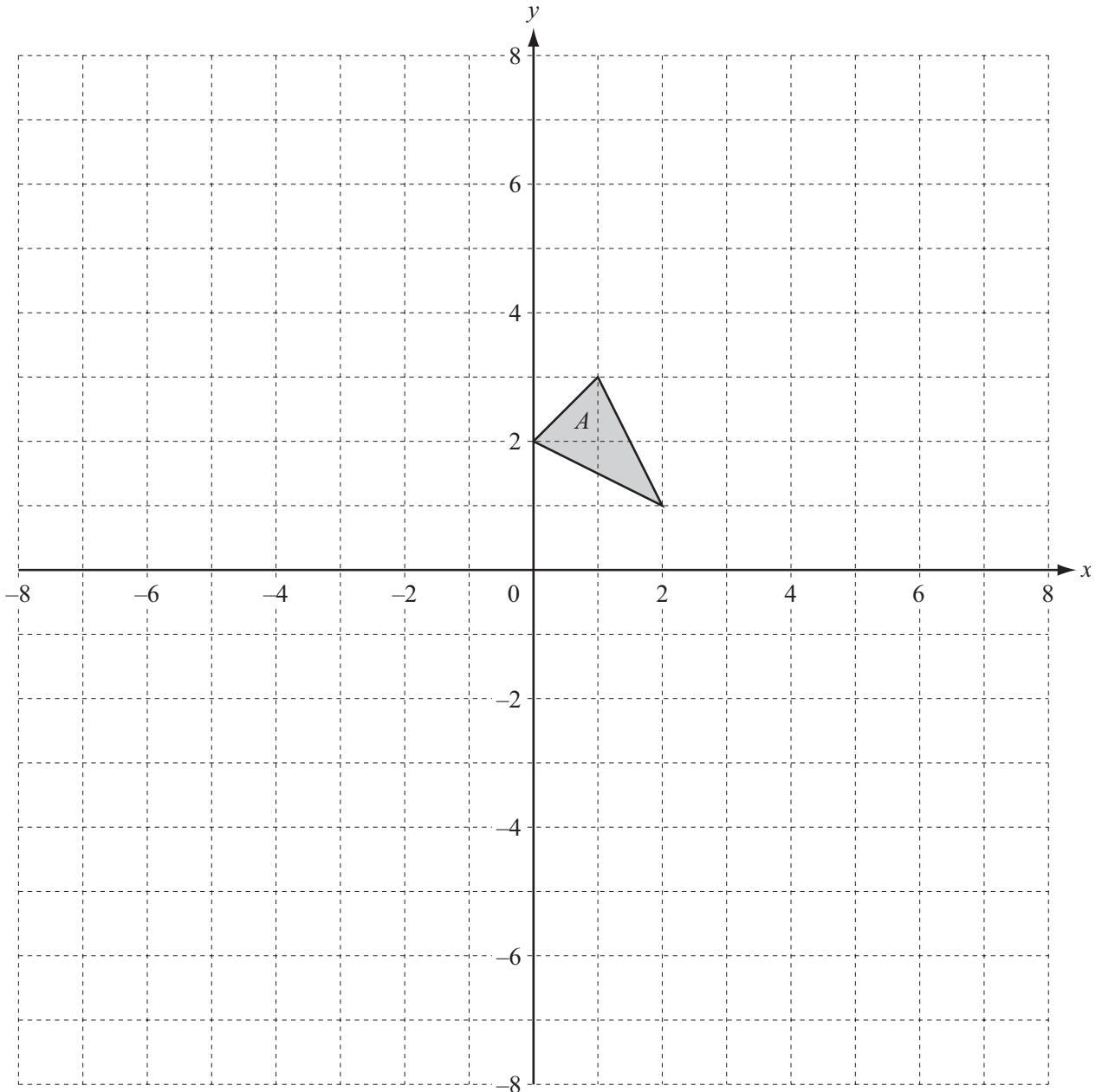


Transformations 2 IGCSE

1)

(a)



Draw the images of the following transformations on the grid above.

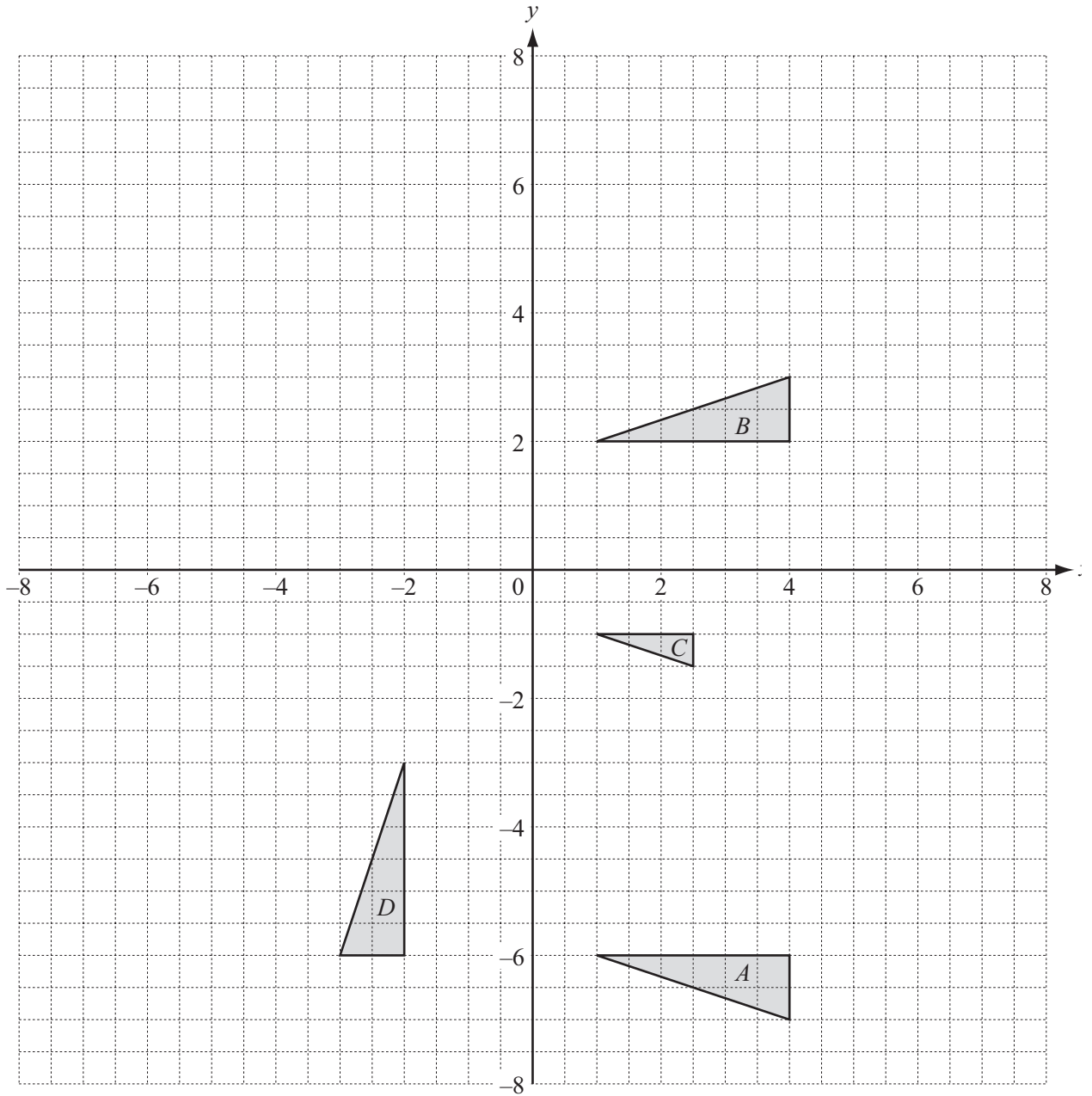
- (i) Translation of triangle A by the vector $\begin{pmatrix} 3 \\ -7 \end{pmatrix}$. Label the image B . [2]
 - (ii) Reflection of triangle A in the line $x = 3$. Label the image C . [2]
 - (iii) Rotation of triangle A through 90° anticlockwise around the point $(0, 0)$. Label the image D . [2]
 - (iv) Enlargement of triangle A by scale factor -4 , with centre $(0, 1)$. Label the image E . [2]
- (b) The area of triangle E is $k \times$ area of triangle A .
Write down the value of k .

Answer(b) $k =$

[1]

Transformations 2 IGCSE

2)



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

(i) triangle *A* onto triangle *B*,

Answer(a)(i)

[2]

(ii) triangle *A* onto triangle *C*,

Answer(a)(ii)

[3]

(iii) triangle *A* onto triangle *D*.

Answer(a)(iii)

[3]

(b) Draw the image of

(i) triangle *B* after a translation of $\begin{pmatrix} -5 \\ 2 \end{pmatrix}$,

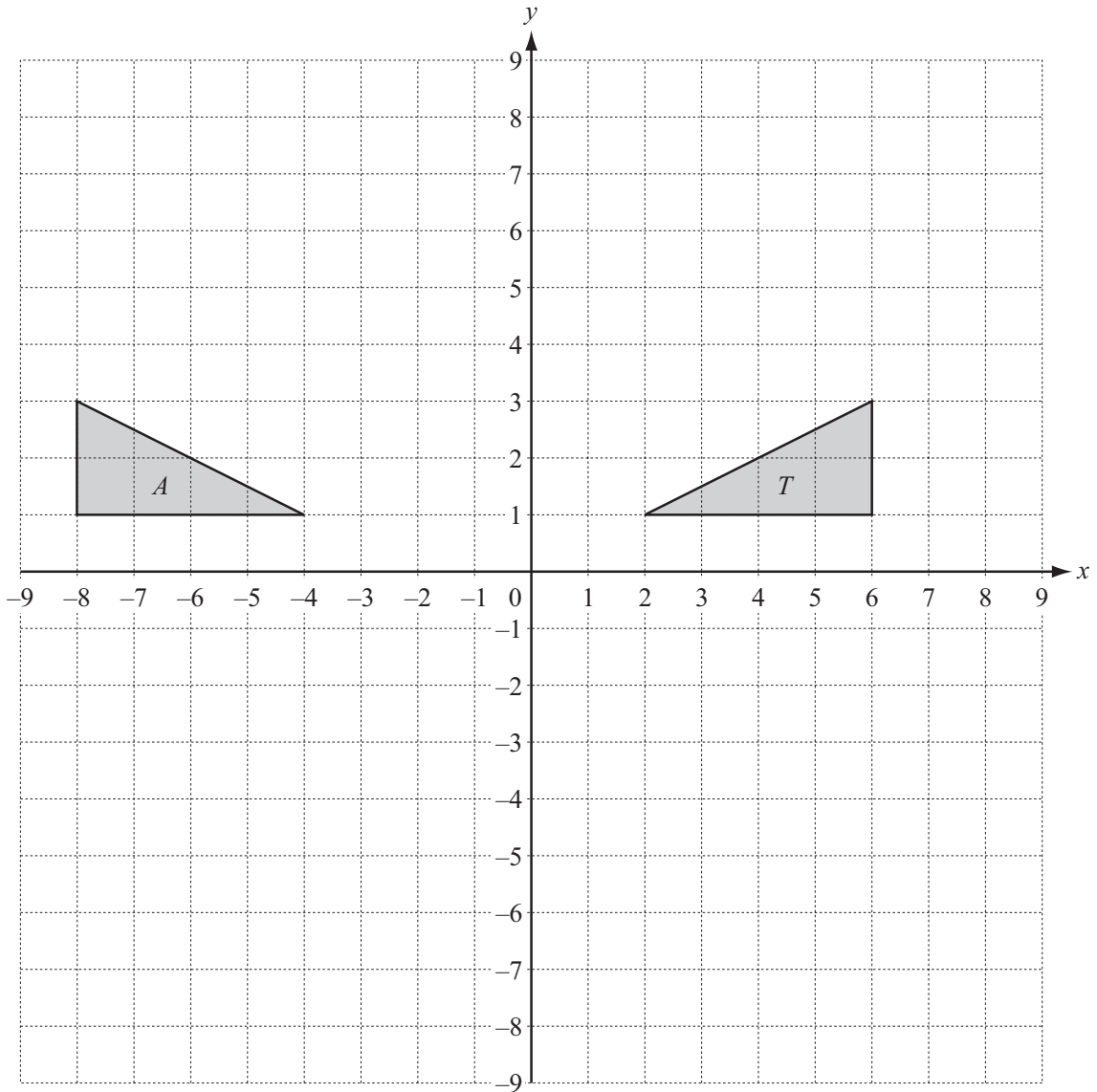
[2]

(ii) triangle *B* after a transformation by the matrix $\begin{pmatrix} 1 & 0 \\ 0 & 2 \end{pmatrix}$.

[3]

Transformations 2 IGCSE

3)



Triangles T and A are drawn on the grid above.

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

Answer(a)

[2]

- (b) (i) Draw the image of triangle T after a rotation of 90° anticlockwise about the point $(0,0)$.

Label the image B .

[2]

- (ii) Draw the image of triangle T after a reflection in the line $x + y = 0$.

Label the image C .

[2]

- (iii) Draw the image of triangle T after an enlargement with centre $(4, 5)$ and scale factor 1.5.

Label the image D .

[2]

Transformations 2 IGCSE

- (c) (i) Triangle T has its vertices at co-ordinates $(2, 1)$, $(6, 1)$ and $(6, 3)$.

Transform triangle T by the matrix $\begin{pmatrix} 1 & 0 \\ 1 & 1 \end{pmatrix}$.

Draw this image on the grid and label it E .

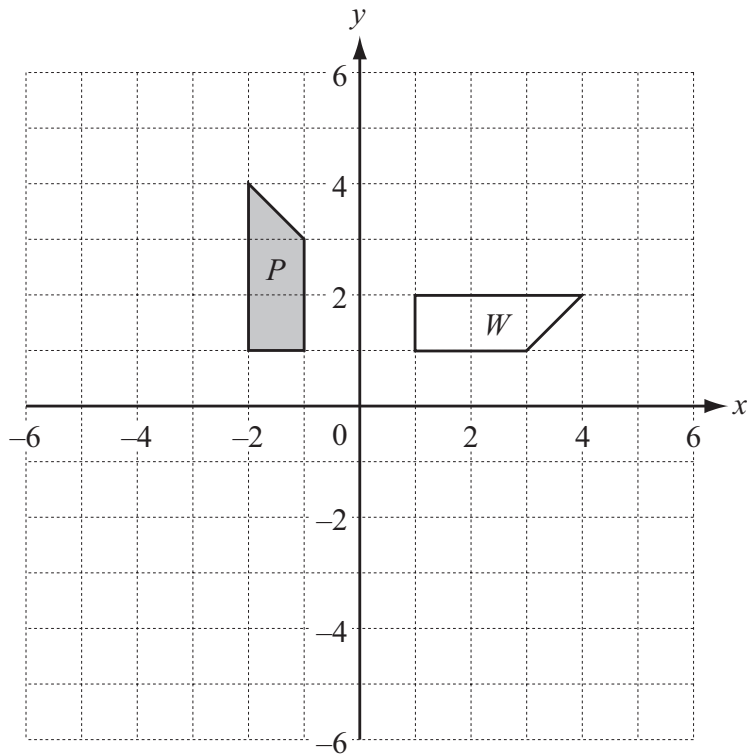
[3]

- (d) Write down the matrix that transforms triangle B onto triangle T .

Answer(d) $\begin{pmatrix} & \\ & \end{pmatrix}$ [2]

Transformations 2 IGCSE

4)



(a) Draw the reflection of shape P in the line $y = x$. [2]

(b) Draw the translation of shape P by the vector $\begin{pmatrix} -2 \\ 1 \end{pmatrix}$. [2]

(c) (i) Describe fully the **single** transformation that maps shape P onto shape W .

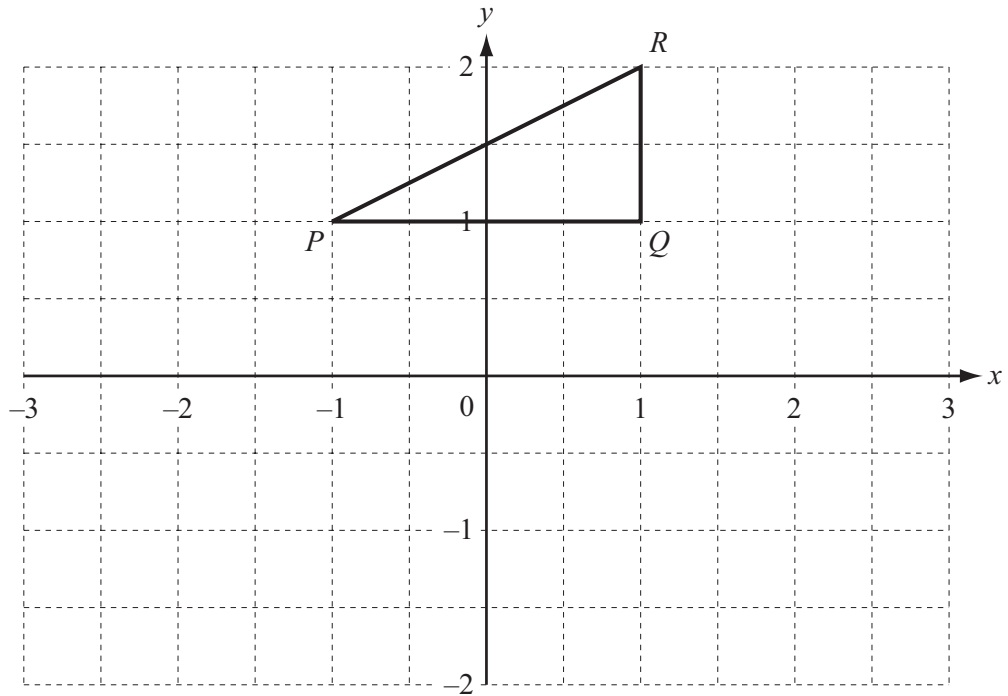
Answer(c)(i) [3]

(ii) Find the 2 by 2 matrix which represents this transformation.

Answer(c)(ii) $\left(\begin{array}{cc} & \\ & \end{array} \right)$ [2]

Transformations 2 IGCSE

5)



The triangle PQR has co-ordinates $P(-1, 1)$, $Q(1, 1)$ and $R(1, 2)$.

- (a) Rotate triangle PQR by 90° clockwise about $(0, 0)$.
Label your image $P'Q'R'$. [2]
- (b) Reflect **your triangle** $P'Q'R'$ in the line $y = -x$.
Label your image $P''Q''R''$. [2]
- (c) Describe fully the **single** transformation which maps triangle PQR onto triangle $P''Q''R''$.

Answer(c) [2]