

Transformations

(Reflection, Enlargement, Rotation, Translation)

Question Paper 8

Level	IGCSE
Subject	Maths (0580)
Exam Board	Cambridge International Examinations (CIE)
Paper Type	Extended
Topic	Matrices and Transformations
Sub-Topic	Transformations (Reflection, Enlargement, Rotation, Translation)
Booklet	Question Paper 8

Time Allowed: 62 minutes

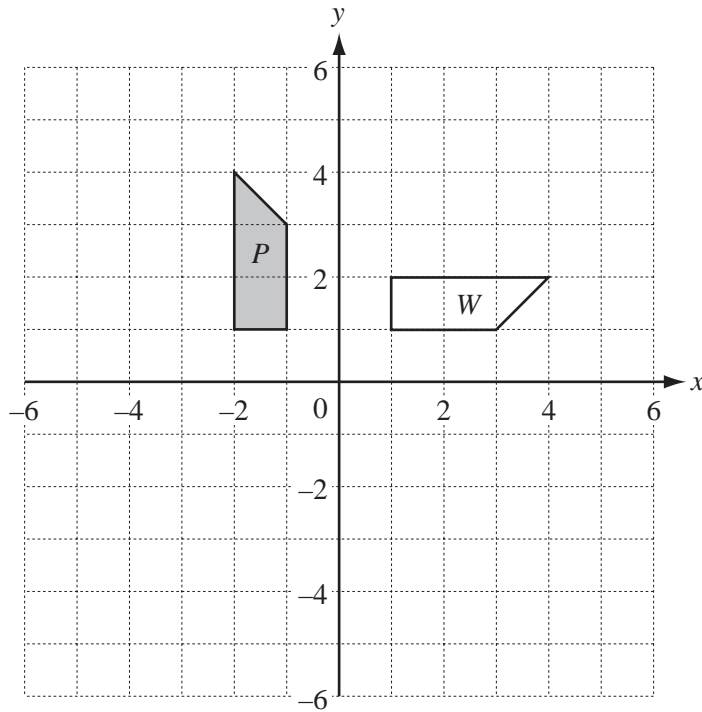
Score: /51

Percentage: /100

Grade Boundaries:

A*	A	B	C	D	E	U
>85%	75%	60%	45%	35%	25%	<25%

1



(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]

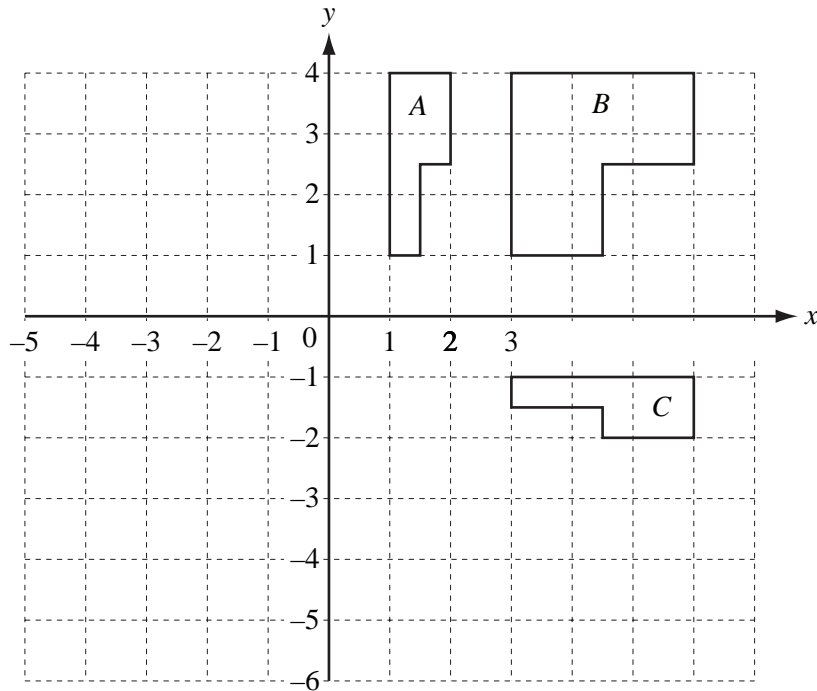
(ii) Find the 2 by 2 matrix which represents this transformation.

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

(d) Describe fully the **single** transformation represented by the matrix $\begin{pmatrix} 1 & 0 \\ 0 & 2 \end{pmatrix}$.

Answer(d) [3]

2



(a) On the grid above, draw the image of

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

(ii) shape *A* after reflection in the line $x = -1$. [2]

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

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

Answer(b)(i) [3]

(ii) shape *A* onto shape *C*.

Answer(b)(ii) [3]

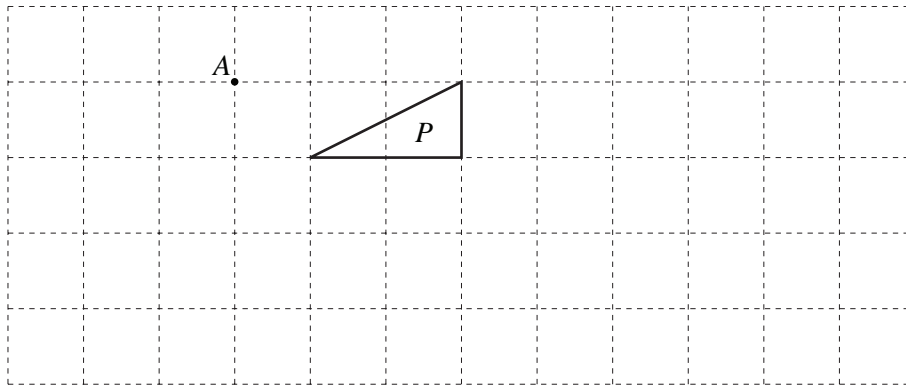
(c) Find the matrix representing the transformation which maps shape *A* onto shape *B*.

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

(d) Describe fully the **single** transformation represented by the matrix $\begin{pmatrix} -1 & 0 \\ 0 & -1 \end{pmatrix}$.

Answer(d) [3]

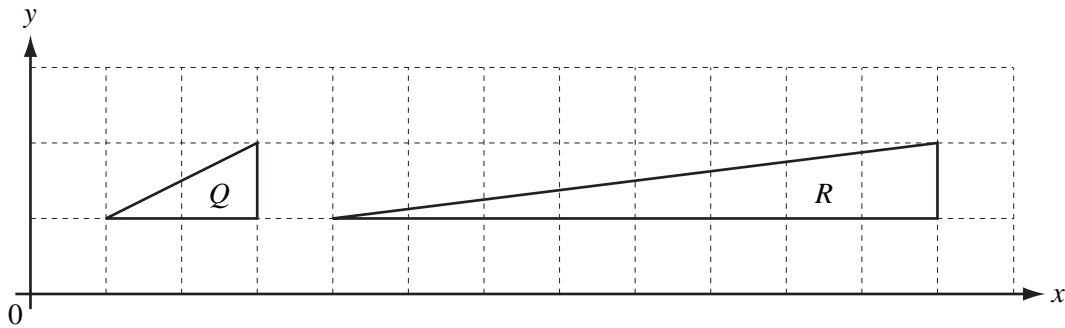
3 (a)



Draw the enlargement of triangle P with centre A and scale factor 2.

[2]

(b)



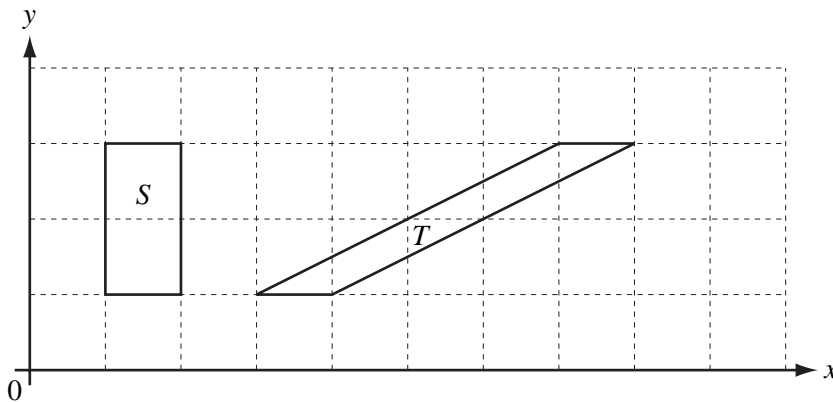
(i) Describe fully the **single** transformation which maps shape Q onto shape R .

Answer(b)(i) [3]

(ii) Find the matrix which represents this transformation.

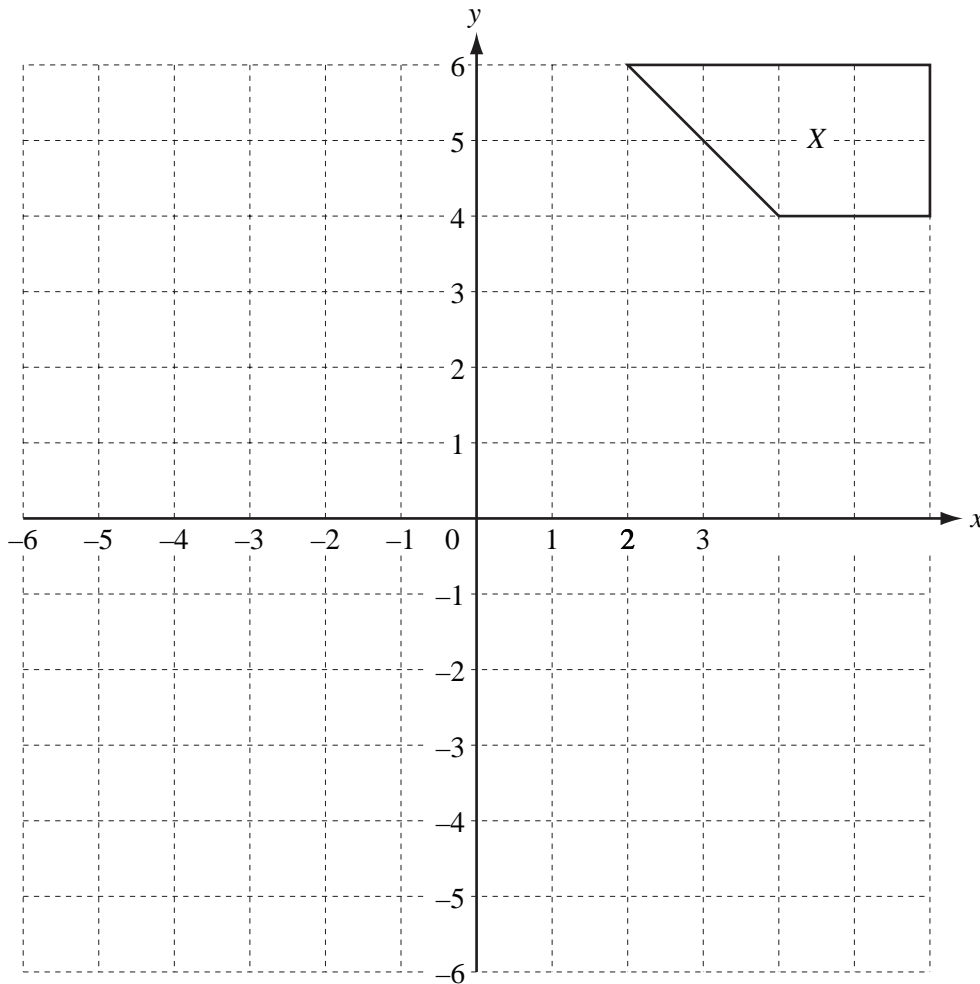
Answer(b)(ii) $\left(\begin{array}{cc} & \\ & \end{array} \right)$ [2]

(c)



Describe fully the **single** transformation which maps shape S onto shape T .

Answer(c) [3]



(a) (i) Draw the reflection of shape **X** in the **x**-axis. Label the image **Y**. [2]

(ii) Draw the rotation of **shape Y**, 90° clockwise about (0, 0). Label the image **Z**. [2]

(iii) Describe fully the **single** transformation that maps shape **Z** onto shape **X**.

Answer(a)(iii) [2]

(b) (i) Draw the enlargement of shape **X**, centre (0, 0), scale factor $\frac{1}{2}$. [2]

(ii) Find the matrix which represents an enlargement, centre (0, 0), scale factor $\frac{1}{2}$.

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

(c) (i) Draw the shear of **shape X** with the **x**-axis invariant and shear factor -1 . [2]

(ii) Find the matrix which represents a shear with the **x**-axis invariant and shear factor -1 .

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