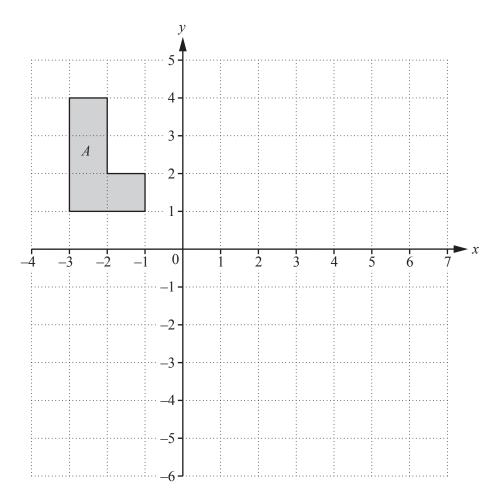
Matrices Transformations



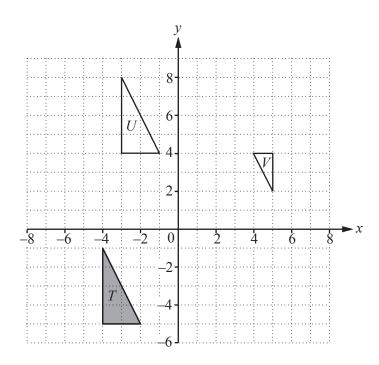
www.Q8maths.com

3 (a)



On the grid, draw the image of

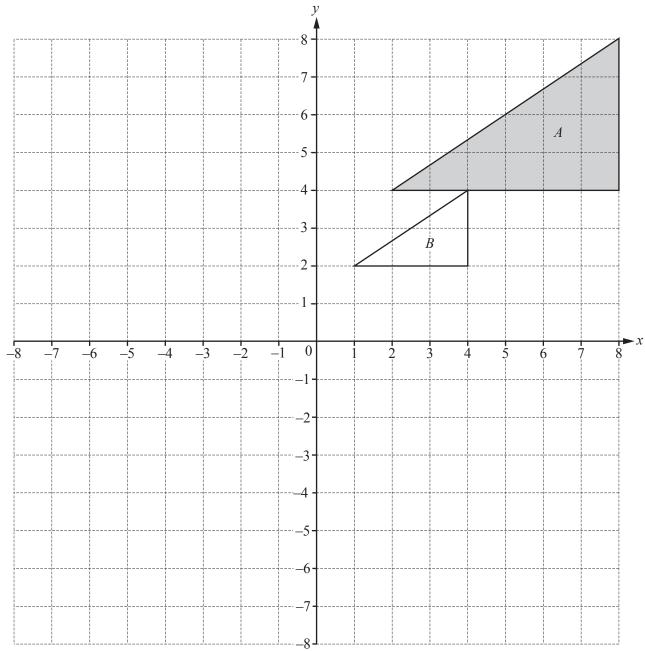
- (i) shape A after a reflection in the line x = 1, [2]
- (ii) shape A after an enlargement with scale factor -2, centre (0, 1), [2]
- (iii) shape A after the transformation represented by the matrix $\begin{pmatrix} 0 & -1 \\ 1 & 0 \end{pmatrix}$. [3]
- **(b)** Describe fully the **single** transformation represented by the matrix $\begin{pmatrix} 3 & 0 \\ 0 & 3 \end{pmatrix}$.



(a) (i)	Draw the image of triangle T after a reflection in the line $x = 0$.	[2]
(ii)	Draw the image of triangle T after a rotation through 90° clockwise about $(-2, -1)$.	[2]
(iii)	Describe fully the single transformation that maps triangle T onto triangle U .	
		[2]
(iv)	Describe fully the single transformation that maps triangle T onto triangle V .	
		[3]

(b) (i) Find the matrix that represents the transformation in part (a)(i).

(ii) Describe fully the **single** transformation represented by the inverse of the matrix in **part** (b)(i).



(a)
$$\mathbf{v} = \begin{pmatrix} -4 \\ -8 \end{pmatrix}$$

(i) Draw the image of triangle A after the translation by vector \mathbf{v} .

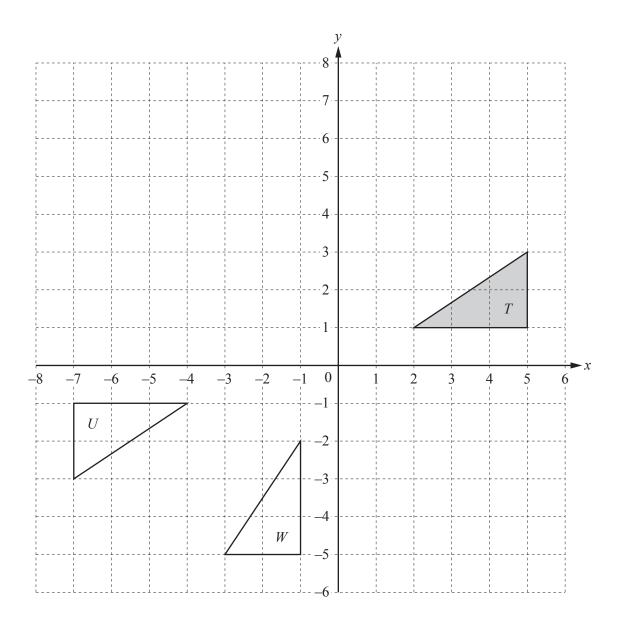
(ii) Calculate |v|.

.....[2]

[2]

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(b)	(i)	Describe fully the single transformation that maps triangle A onto triangle B .							
					[3]				
	(ii)	Find the matrix that represents the transformation that maps	triangle A onto trian	ngle B.					
					[2]				
	(iii)	Calculate the determinant of the matrix in part (b)(ii).							
					[1]				



(a) On the grid, draw the image of

(i) triangle *T* after a translation by the vector
$$\begin{pmatrix} -4\\4 \end{pmatrix}$$
, [2]

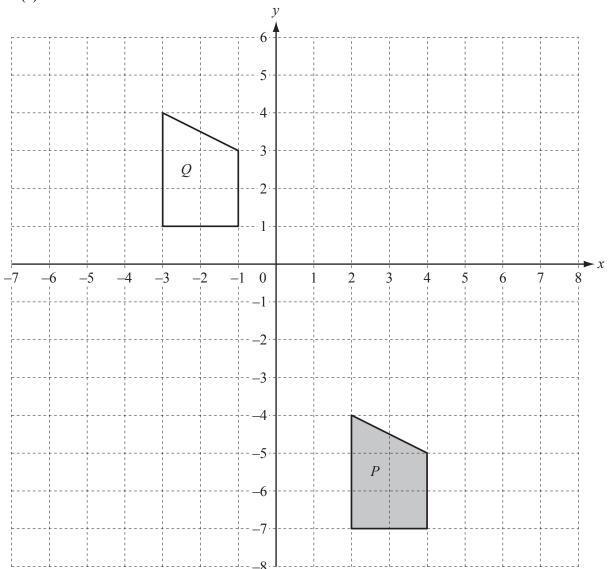
(ii) triangle T after a reflection in the line y = -1. [2]

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(b)	Des	scribe fully the single transformation that maps triangle T onto triangle U .			
	Ans	wer(b)			
	••••				[3]
(c)	(i)	Describe fully the single transformation that maps triangle T onto triangle W	7.		
		<i>Answer(c)</i> (i)		•••••	
			••••••		[2]
	(ii)	Find the 2×2 matrix that represents the transformation in part (c)(i).			
			(\	
		Answer(c)(ii)			[2]



2 (a)

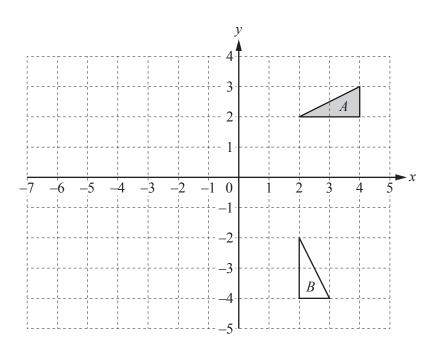


(i) Describe fully the **single** transformation which maps shape P onto shape Q.

- (ii) On the grid above, draw the image of shape P after reflection in the line y = -1. [2]
- (iii) On the grid above, draw the image of shape P under the transformation represented by the matrix $\begin{pmatrix} 0 & -1 \\ 1 & 0 \end{pmatrix}$. [3]

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(c)



(i) On the grid, draw the image of triangle A after the transformation represented by the

$$\operatorname{matrix} \begin{pmatrix} -1.5 & 0 \\ 0 & -1.5 \end{pmatrix}.$$
 [3]

(ii) Find the 2×2 matrix which represents the transformation that maps triangle A onto triangle B.

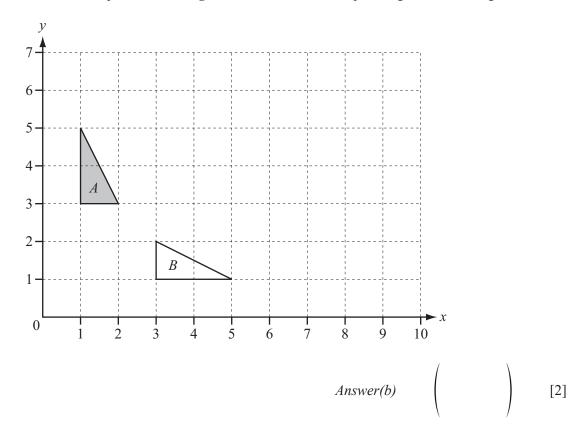
Question 11 is printed on the next page.

$$\mathbf{19} \quad \mathbf{(a)} \qquad \mathbf{N} = \begin{pmatrix} 0 & 1 \\ -1 & 0 \end{pmatrix}$$

Describe fully the **single** transformation represented by N.

Answer(a) .	 	 	 	
	 	 	 	 [3]

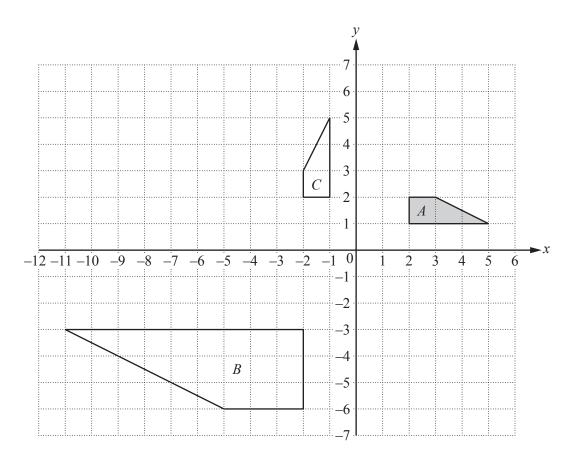
(b) Find the matrix which represents the **single** transformation that maps triangle A onto triangle B.



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(a) Draw the image of

(i) shape A after a translation by
$$\binom{-1}{3}$$
, [2]

(ii) shape A after a rotation through
$$180^{\circ}$$
 about the point $(0, 0)$, [2]

(iii) shape A after the transformation represented by the matrix
$$\begin{pmatrix} 1 & 0 \\ 0 & -1 \end{pmatrix}$$
. [3]

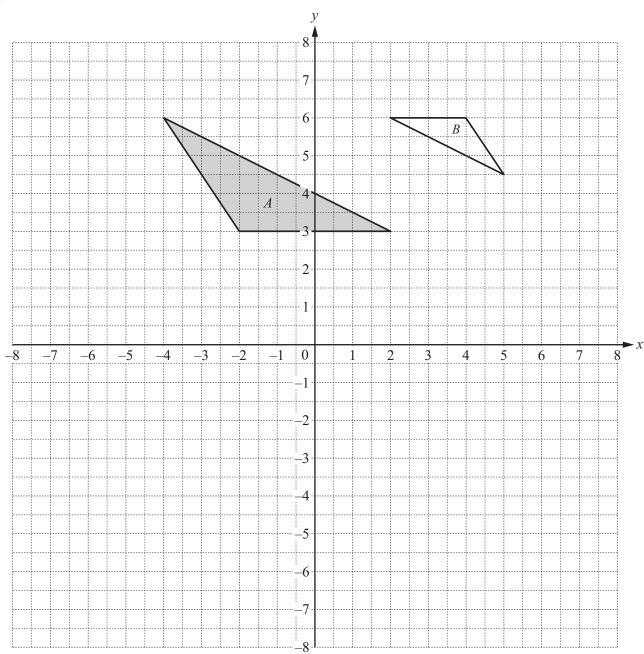
(b) Describe fully the **single** transformation that maps shape A onto shape B.

Answer(b)	 	 	 	
	 	 	 	[3]

(c) Find the matrix which represents the transformation that maps shape A onto shape C.

$$Answer(c) \qquad \left(\qquad \right) \qquad [2]$$

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(a)	Dogariba	fully the	cinale t	ranafarm	ation that	mong trior	nala 1 a	nto triangle	D
(9)	Describe	tilliv the	single t	ranstorma	ation that	mans triar	1012 A O	nto triangle	ĸ

Answer(a)	 	 	
	 	 	 [3]

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a .	_	. 1		4	. 1		
(b) (On '	the	grid,	draw	the	image	ot

- (i) triangle A after a reflection in the line x = -3, [2]
- (ii) triangle A after a rotation about the origin through 270° anticlockwise, [2]

(iii) triangle A after a translation by the vector
$$\begin{pmatrix} -1 \\ -5 \end{pmatrix}$$
. [2]

- (c) M is the matrix that represents the transformation in part (b)(ii).
 - (i) Find M.

(ii) Describe fully the single transformation represented by M^{-1} , the inverse of M.

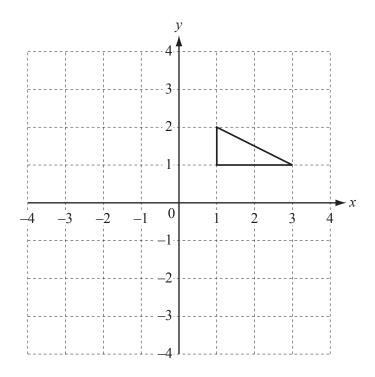
Answer(c)(ii)	
	[2]

17 (p, q) is the image of the point (x, y) under this combined transformation.

For Examiner's Use

$$\begin{pmatrix} p \\ q \end{pmatrix} = \begin{pmatrix} -1 & 0 \\ 0 & 1 \end{pmatrix} \begin{pmatrix} x \\ y \end{pmatrix} + \begin{pmatrix} 3 \\ 2 \end{pmatrix}$$

(a) Draw the image of the triangle under the combined transformation.



[3]

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

Answer (b) [2]

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