

Transformations and Vectors

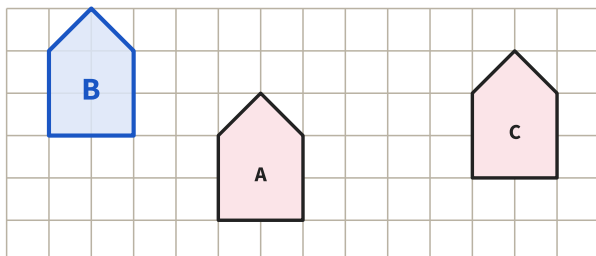
ANSWERS

Ruler and tracing paper | 30 minutes | Total marks: 34

Name

Class

1



- (a) Translate shape A 4 squares left and 2 squares up.
Label the new shape B.

4 left (1) 2 up (1)

[2 marks]

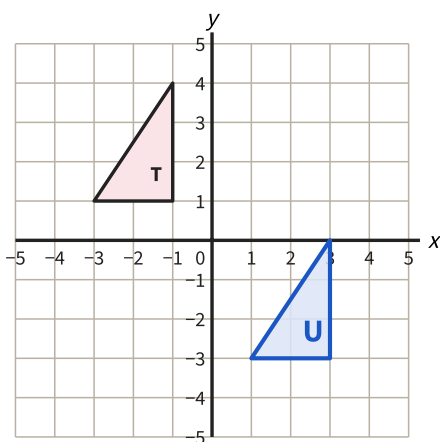
- (b) Shape A is translated onto shape C.
Write down the column vector for this translation.

Answer

$\begin{pmatrix} 6 \\ 1 \end{pmatrix}$ (1)

[1 mark]

(c)



Translate triangle T by the vector $\begin{pmatrix} 4 \\ -4 \end{pmatrix}$

Label the new triangle U.

[2 marks]

4 right (1) 4 down (1)

- (d) The point (3, 1) is translated by the vector $\begin{pmatrix} -4 \\ 2 \end{pmatrix}$
Write down the coordinates of the new point.

Answer

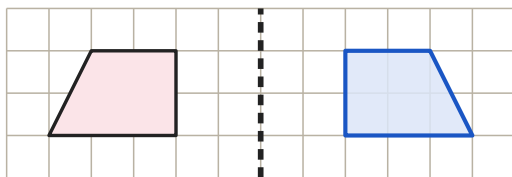
$(-1, 3)$ (1)

[1 mark]

2

(a) Reflect the shape in the mirror line.

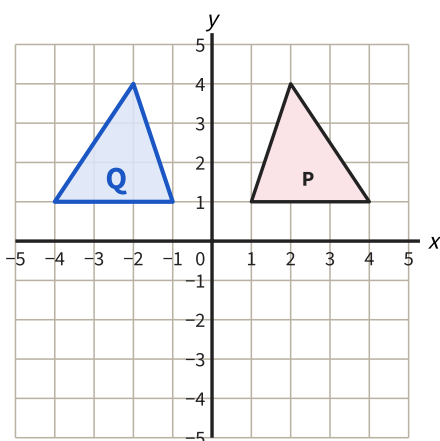
mirror line



3 corners correct (1) All correct (1)

[2 marks]

(b)

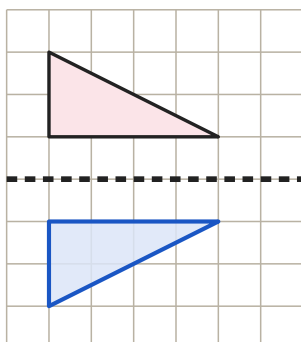


Reflect triangle P in the y-axis.
Label the new triangle Q.

[2 marks]

2 corners correct (1) All correct (1)

(c)



The dashed line is a mirror line.
Reflect the triangle in the mirror line.

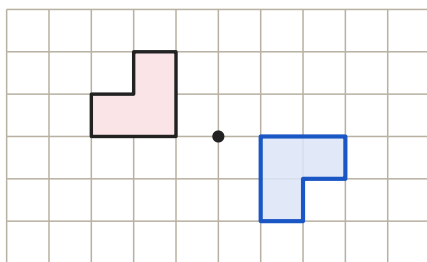
[2 marks]

2 corners correct (1) All correct (1)

3

You may use tracing paper.

(a)

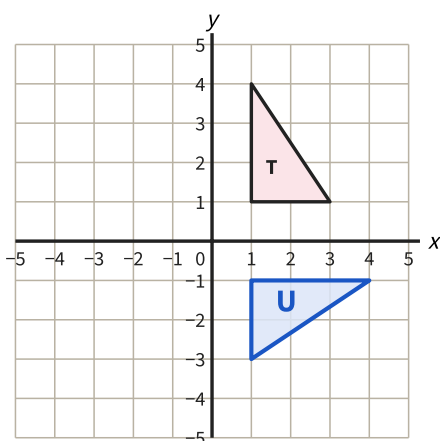


Half turn (1) Correct position (1)

Rotate the shape 180° about the point marked with a dot.

[2 marks]

(b)



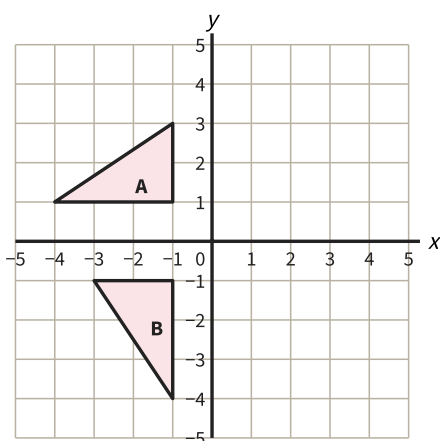
Rotate triangle T 90° clockwise about the point (0, 0)

Label the new triangle U.

[2 marks]

Correct turn (1) Correct position (1)

(c)



Triangle A is rotated about the point (0, 0) to give triangle B.

Write down the angle and the direction of the turn.

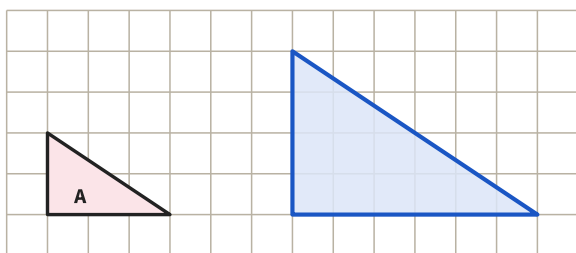
Angle 90° (1)

Direction *anticlockwise* (1)

[2 marks]

4

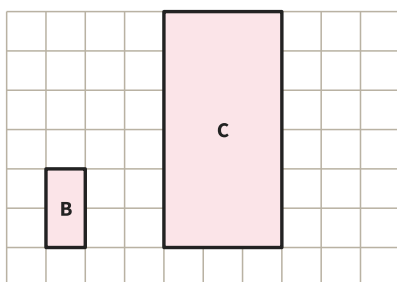
- (a) On the grid, draw an enlargement of triangle A with scale factor 2



Base 6 squares (1) Height 4 squares (1)

[2 marks]

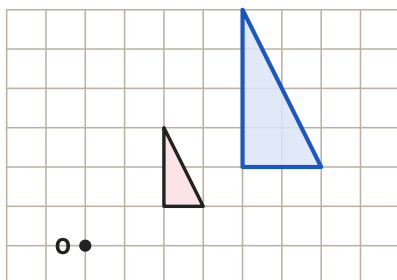
- (b)



Shape C is an enlargement of shape B.
Write down the scale factor.

Answer 3 (1) [1 mark]

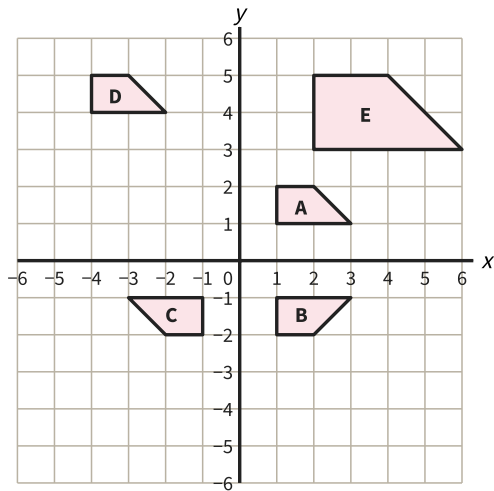
- (c)



Enlarge the triangle by scale factor 2, centre O.

[2 marks]

Sides twice as long (1) Correct position (1)



- (a) Shape A is mapped onto shapes B, C, D and E. Write down the name of each transformation.

A onto B reflection (1)

A onto C rotation (1)

A onto D translation (1)

A onto E enlargement (1)

[4 marks]

- (b) Which one of these transformations changes the size of a shape?

Answer enlargement (1) [1 mark]

6

$$\mathbf{a} = \begin{pmatrix} 3 \\ 1 \end{pmatrix} \quad \mathbf{b} = \begin{pmatrix} 2 \\ -4 \end{pmatrix}$$

(a) Work out $\mathbf{a} + \mathbf{b}$

Answer $\begin{pmatrix} 5 \\ -3 \end{pmatrix}$ (1) [1 mark]

(b) Work out $\mathbf{b} - \mathbf{a}$

Answer $\begin{pmatrix} -1 \\ -5 \end{pmatrix}$ (1) [1 mark]

(c) Work out $2\mathbf{a}$

Answer $\begin{pmatrix} 6 \\ 2 \end{pmatrix}$ (1) [1 mark]

(d) A shape moves 5 squares right and 2 squares down.
Write this translation as a column vector.

Answer $\begin{pmatrix} 5 \\ -2 \end{pmatrix}$ (1) [1 mark]

(e) Describe in words the translation $\begin{pmatrix} -3 \\ 4 \end{pmatrix}$

3 squares left (1)

4 squares up (1)

[2 marks]

Question	Topic	RAG
1	I can translate a shape or a point and write the column vector	
2	I can reflect a shape in a mirror line and in an axis	
3	I can rotate a shape and say how a shape has been turned	
4	I can enlarge a shape and find a scale factor	
5	I can recognise reflections, rotations, translations and enlargements	
6	I can work with column vectors	