GCSE Maths – Geometry and Measures

Translations as 2D Vectors

Worksheet

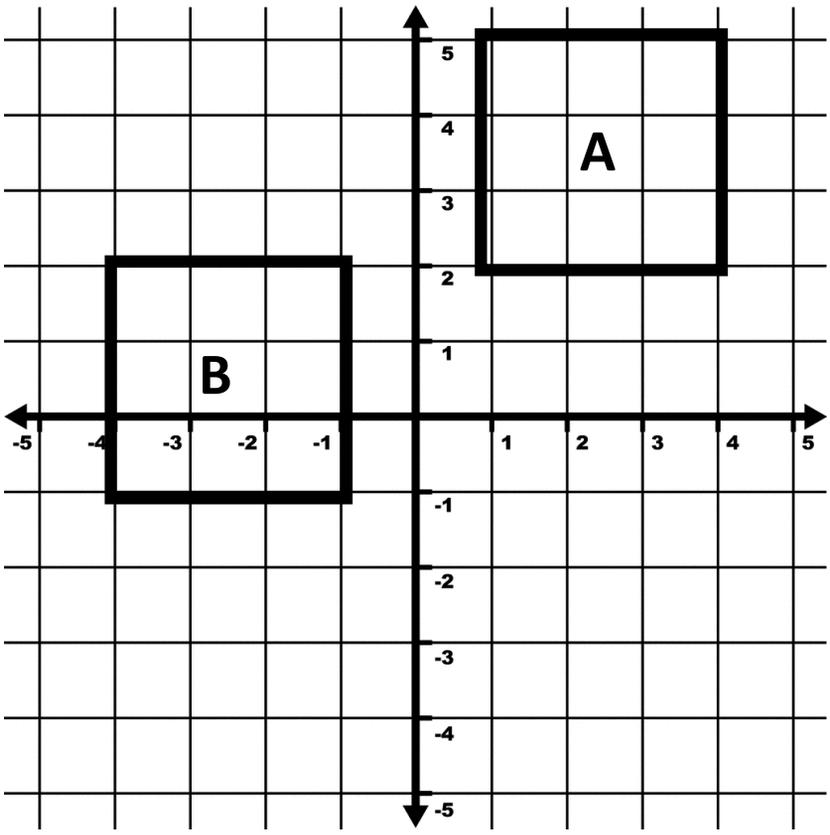
WORKED SOLUTIONS

This worksheet will show you how to work out different types of 2D translation questions. Each section contains a worked example, a question with hints and then questions for you to work through on your own.

Section A

Worked Example

Describe the translation of shape A to shape B as a column vector.



Step 1: Describe the translation of one vertex of shape A to shape B.

The top left vertex has moved from $(1,5)$ *to* $(-4,,2)$.

Step 2: Work out how many units vertically and horizontally shape A has moved.

It has moved 5 units to the left and 3 units down.

Step 3: Write the translation as a column vector.

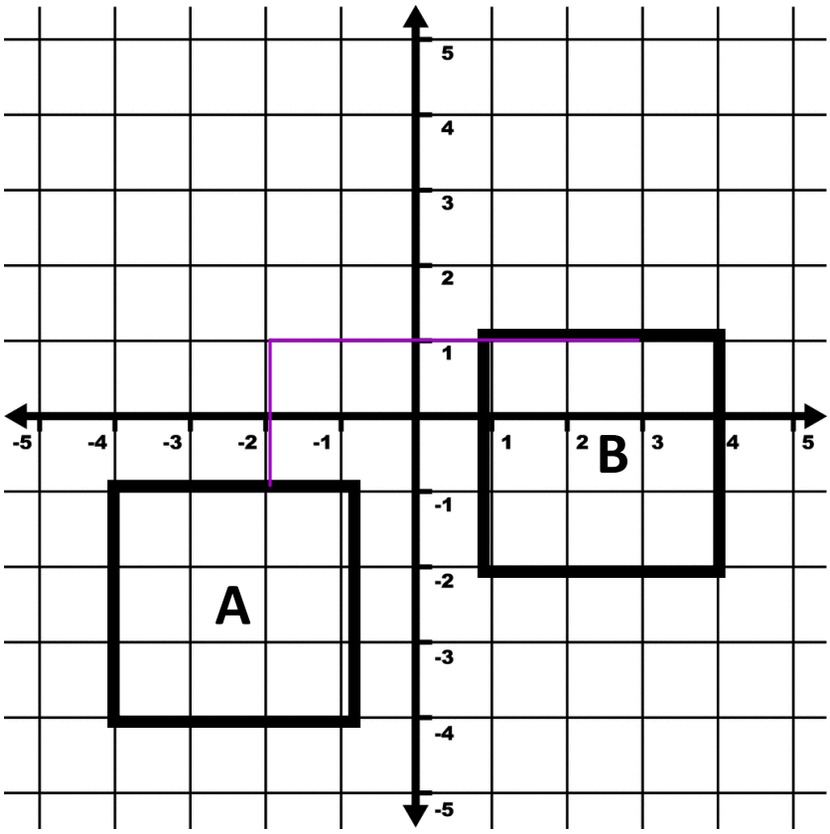
As the vertex has moved towards the left in the x-direction, we demonstrate this using a negative sign.

As the vertex has moved down in the y-direction, we demonstrate this using a negative sign.

Column vector: $\begin{pmatrix} -5 \\ -3 \end{pmatrix}$

Guided Example

Describe the translation of shape A to shape B as a column vector.



Step 1: Describe the translation of one vertex of shape A to shape B.

The top right vertex (-1,-1) has moved to (4,1)

Step 2: Work out how many units vertically and horizontally it has moved.

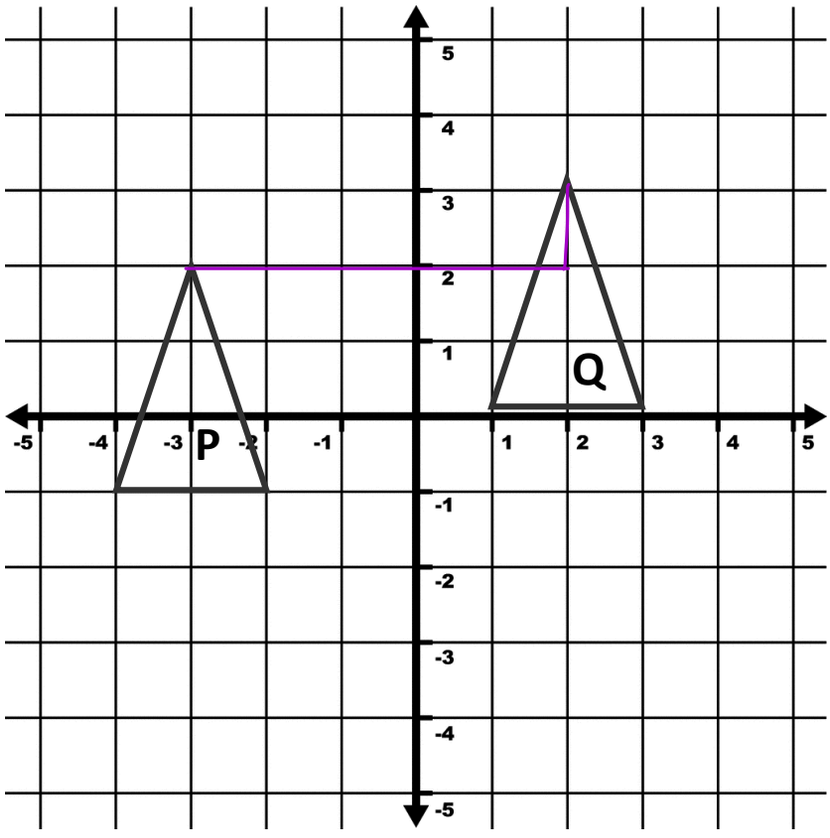
The vertex has move 5 right and 2up

Step 3: Write the translation as a column vector.

$$\begin{pmatrix} 5 \\ 2 \end{pmatrix}$$

Now it's your turn!
If you get stuck, look back at the worked and guided examples.

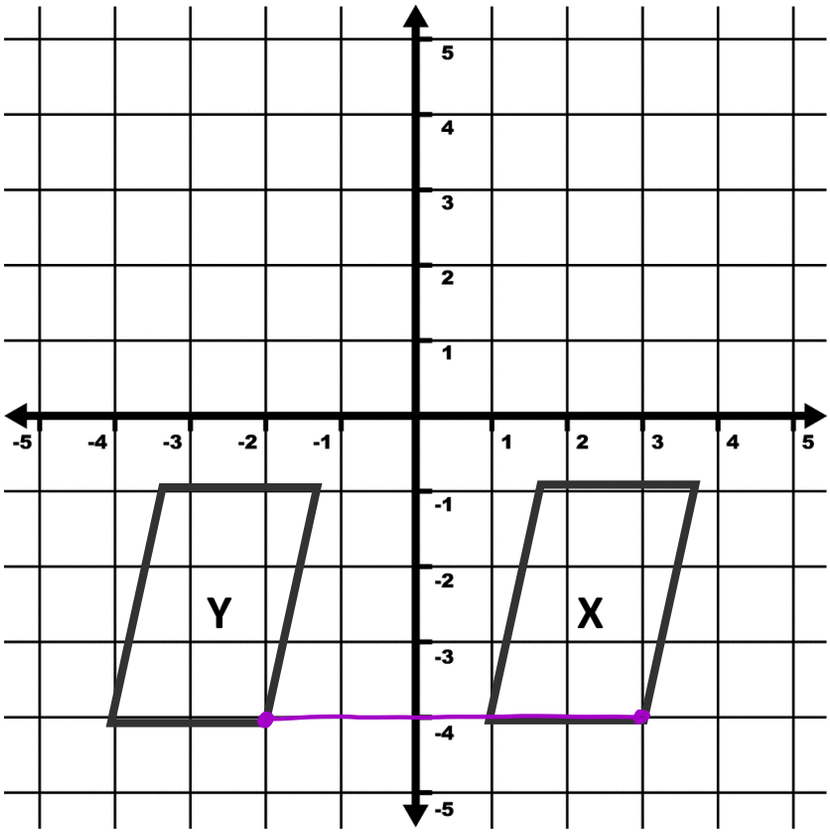
1. Describe the translation of shape P to shape Q as a column vector.



(-3, 2) has moved to (2, 3)
↳ 5 right, 1 up

$\begin{pmatrix} 5 \\ 1 \end{pmatrix}$

2. Describe the translation of shape X to shape Y as a column vector.



(3, -4) has move to (-2, -4)

↳ 5 left, 0 up

↓

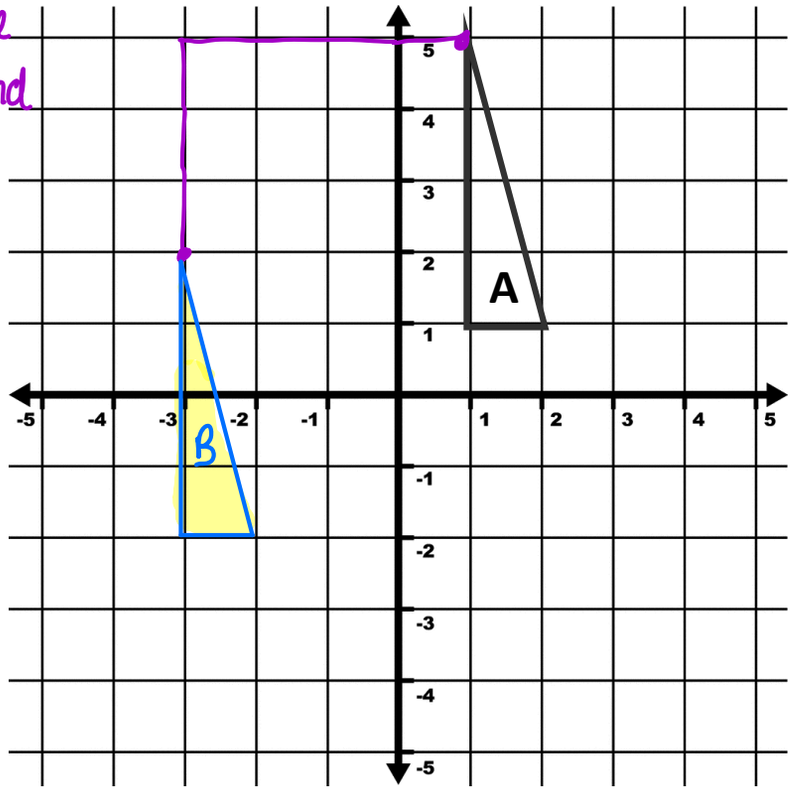
left means it will hold a negative value in vector form

$\begin{pmatrix} -5 \\ 0 \end{pmatrix}$

3. Translate shape A by the vector $\begin{pmatrix} -4 \\ -3 \end{pmatrix}$ and label the new shape B.

4 left, 3 down

negative value means left and down



Just 2 down

4. Translate shape C by the column vector $\begin{pmatrix} 0 \\ -2 \end{pmatrix}$ and label the new shape D.