

Translations and Column Vectors

For AQA GCSE Mathematics (8300) • Foundation tier

Name _____

Total marks: **21**

Answer **all** questions in the spaces provided. Show your working: marks are given for correct method.

- 1** A point moves 3 squares down.
Circle the column vector for this translation.

[1 mark]

$$\begin{pmatrix} 3 \\ 0 \end{pmatrix}$$

$$\begin{pmatrix} 0 \\ 3 \end{pmatrix}$$

$$\begin{pmatrix} -3 \\ 0 \end{pmatrix}$$

$$\begin{pmatrix} 0 \\ -3 \end{pmatrix}$$

- 2** A shape is translated 6 squares to the left and 2 squares up.
Write this translation as a column vector.

[1 mark]

Answer $\begin{pmatrix} \\ \end{pmatrix}$

- 3** The point $(-2, 3)$ is translated by the vector $\begin{pmatrix} 5 \\ -4 \end{pmatrix}$
Write down the coordinates of the image.

[1 mark]

Answer (_____ , _____)

4 $\mathbf{a} = \begin{pmatrix} 2 \\ 5 \end{pmatrix}$ $\mathbf{b} = \begin{pmatrix} -1 \\ 3 \end{pmatrix}$

Write as a column vector

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

[1 mark]

Answer $\begin{pmatrix} \\ \end{pmatrix}$

(b) $2\mathbf{a}$

[1 mark]

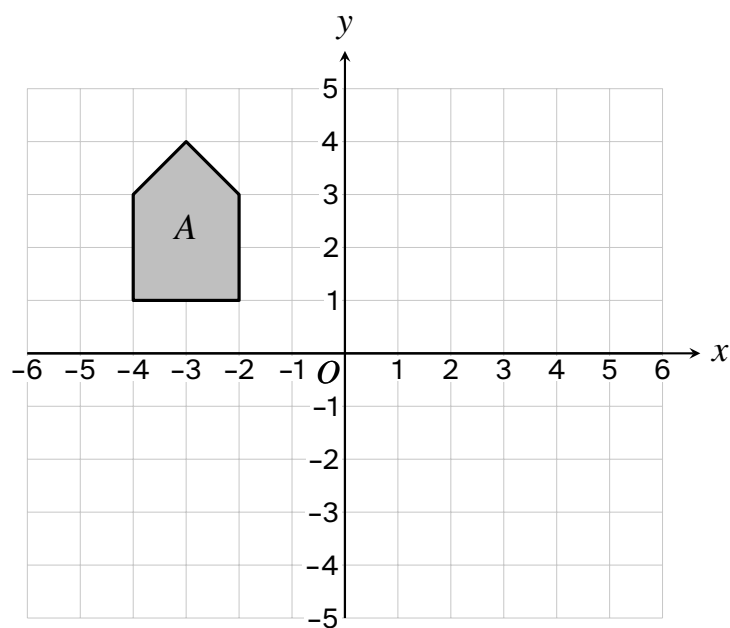
Answer $\begin{pmatrix} \\ \end{pmatrix}$

(c) $\mathbf{a} - \mathbf{b}$

[1 mark]

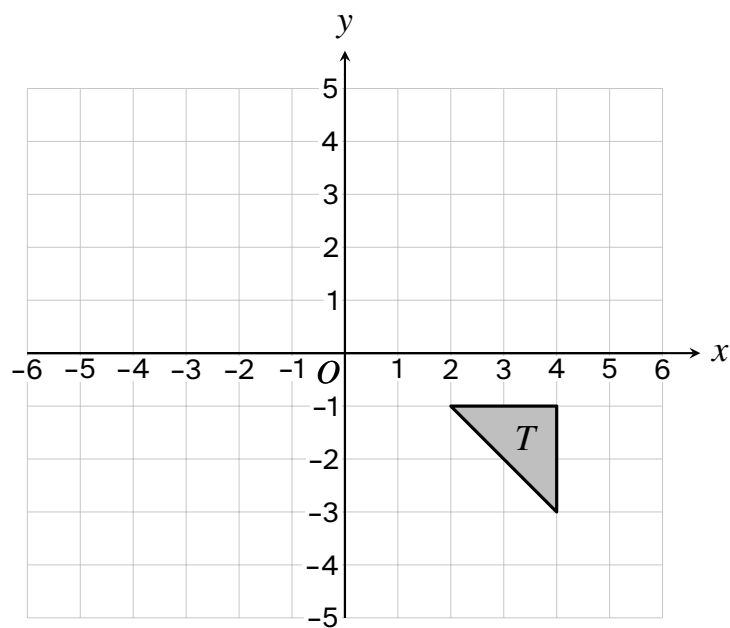
Answer $\begin{pmatrix} \\ \end{pmatrix}$

- 5 Translate shape A by the vector $\begin{pmatrix} 5 \\ -5 \end{pmatrix}$



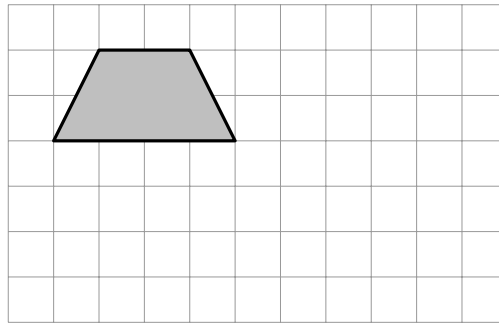
[2 marks]

- 6 Translate triangle T by the vector $\begin{pmatrix} -6 \\ 4 \end{pmatrix}$



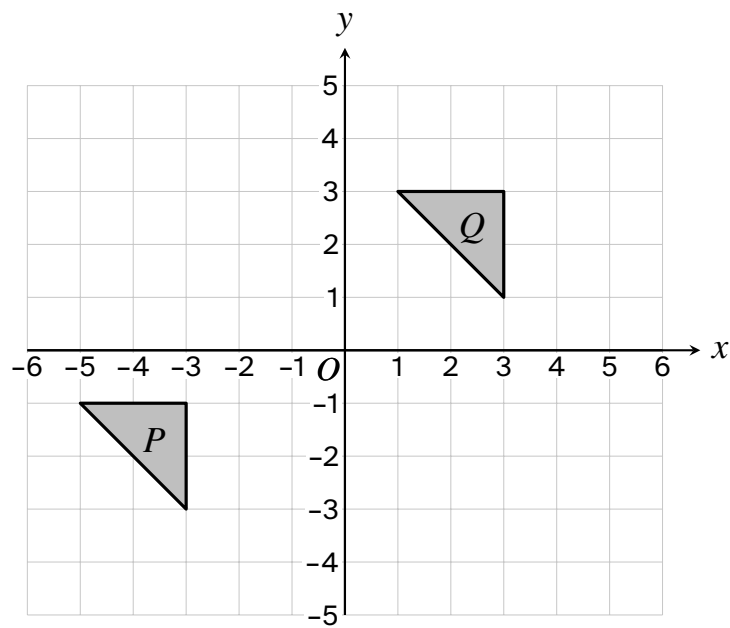
[2 marks]

- 7 Here is a trapezium on a square grid.
Translate the trapezium 5 squares to the right and 3 squares down.



[2 marks]

- 8 Work out the vector that translates triangle P to triangle Q .



[2 marks]

Answer $\left(\begin{array}{c} \\ \end{array} \right)$

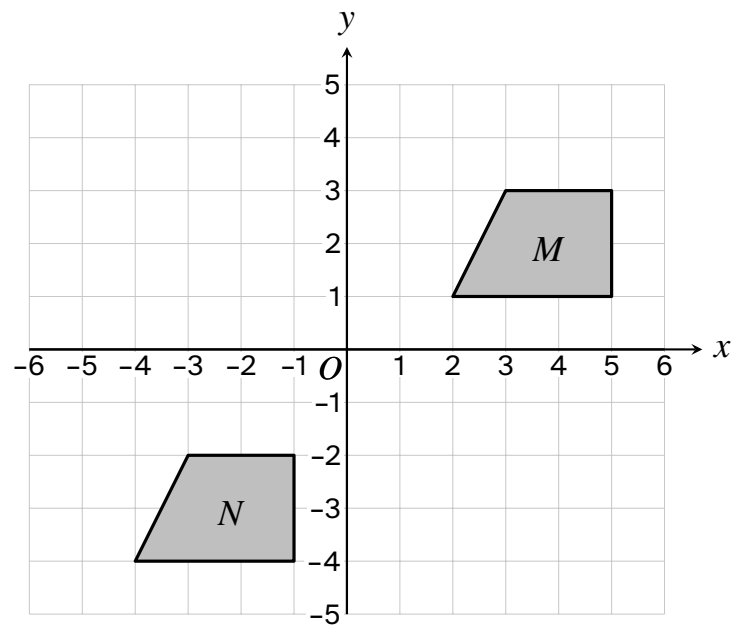
- 9 The vector $\begin{pmatrix} -3 \\ 7 \end{pmatrix}$ translates shape A to shape B .

Write down the vector that translates shape B to shape A .

[1 mark]

Answer $\begin{pmatrix} \\ \end{pmatrix}$

- 10 Describe fully the single transformation that maps shape M onto shape N .



[2 marks]

- 11** A triangle has a vertex at $(2, 5)$
The triangle is translated. The vertex moves to $(-1, 7)$
Write down the column vector of the translation.

[2 marks]

Answer $\begin{pmatrix} \\ \end{pmatrix}$

- 12** Shape A is translated by the vector $\begin{pmatrix} 2 \\ -3 \end{pmatrix}$ to give shape B .
Shape B is translated by the vector $\begin{pmatrix} -5 \\ 1 \end{pmatrix}$ to give shape C .
Write down the vector that translates shape A to shape C .

[2 marks]

Answer $\begin{pmatrix} \\ \end{pmatrix}$