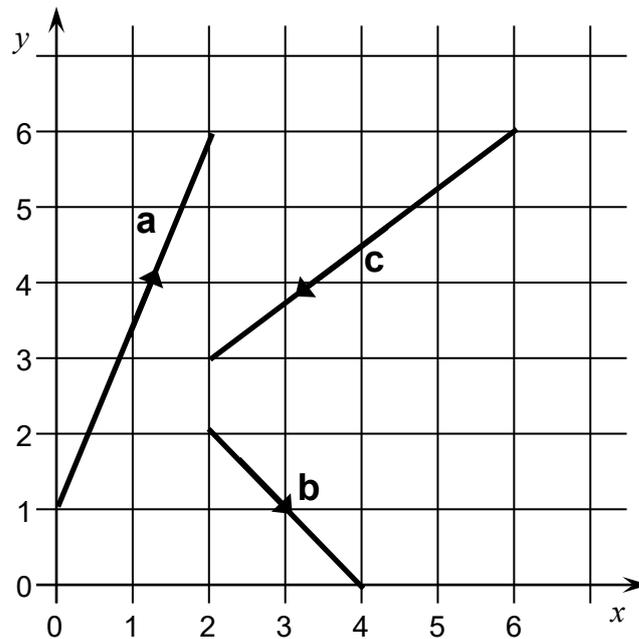


# Topic Test 1 (20 minutes)

## Vectors - Foundation

Use this diagram to answer questions 1 to 4

The diagram shows three vectors, **a**, **b** and **c**.



1 Write the vector **a** in column form.

[1 mark]

Answer  $\begin{pmatrix} \phantom{0} \\ \phantom{0} \end{pmatrix}$

2 Write the vector  $-\mathbf{c}$  in column form.

[1 mark]

Answer  $\begin{pmatrix} \phantom{0} \\ \phantom{0} \end{pmatrix}$

- 3 Write, in column form, the vector that is parallel to  $\mathbf{b}$  twice as long as  $\mathbf{b}$ .

[1 mark]

Answer  $\begin{pmatrix} \phantom{0} \\ \phantom{0} \end{pmatrix}$

- 4 Which of the following is true?  
Circle your answer.

[1 mark]

$$\mathbf{a} = \mathbf{b} + \mathbf{c}$$

$$\mathbf{a} - \mathbf{b} = \mathbf{c}$$

$$\mathbf{a} + \mathbf{b} + \mathbf{c} = \mathbf{0}$$

$$\mathbf{a} + \mathbf{b} = \mathbf{c}$$

5 (a) Work out  $3 \times \begin{pmatrix} -2 \\ 4 \end{pmatrix}$

[1 mark]

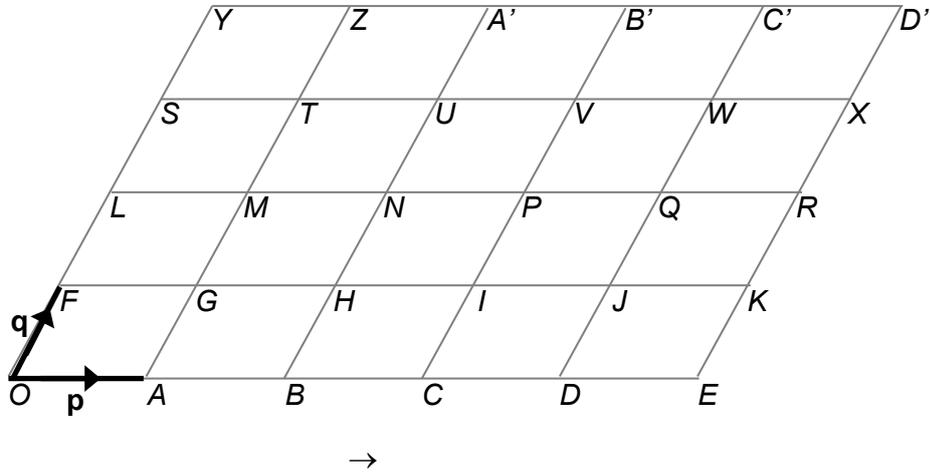
Answer  $\begin{pmatrix} \phantom{0} \\ \phantom{0} \end{pmatrix}$

5 (b) Work out  $\begin{pmatrix} 2 \\ 3 \end{pmatrix} - \begin{pmatrix} -1 \\ 5 \end{pmatrix}$

[1 mark]

Answer  $\begin{pmatrix} \phantom{0} \\ \phantom{0} \end{pmatrix}$

6 Two vectors  $\mathbf{p}$  and  $\mathbf{q}$  are shown on the grid.



6 (a) Write, in terms of  $\mathbf{p}$  and  $\mathbf{q}$ , the vector  $HC'$ .

[1 mark]

Answer \_\_\_\_\_

6 (b) Write, in letters, any vector equal to  $2\mathbf{p} - 4\mathbf{q}$

[1 mark]

Answer \_\_\_\_\_

6 (c) Draw, on the diagram, the vector representation of

$$(\mathbf{p} - 2\mathbf{q}) + (-2\mathbf{p} + \mathbf{q}) = -(\mathbf{p} + \mathbf{q})$$

[2 marks]

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**7 (a)** Work out the values of  $a$  and  $b$ .

$$\begin{pmatrix} a \\ 6 \end{pmatrix} + \begin{pmatrix} 4 \\ b \end{pmatrix} = \begin{pmatrix} 7 \\ 3 \end{pmatrix}$$

**[2 marks]**

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$a =$  \_\_\_\_\_

$b =$  \_\_\_\_\_

**7 (b)** Work out the value of  $c$ .

$$\begin{pmatrix} c \\ 5 \end{pmatrix} + 2 \times \begin{pmatrix} 3 \\ d \end{pmatrix} = \begin{pmatrix} d \\ 8 \end{pmatrix}$$

**[2 marks]**

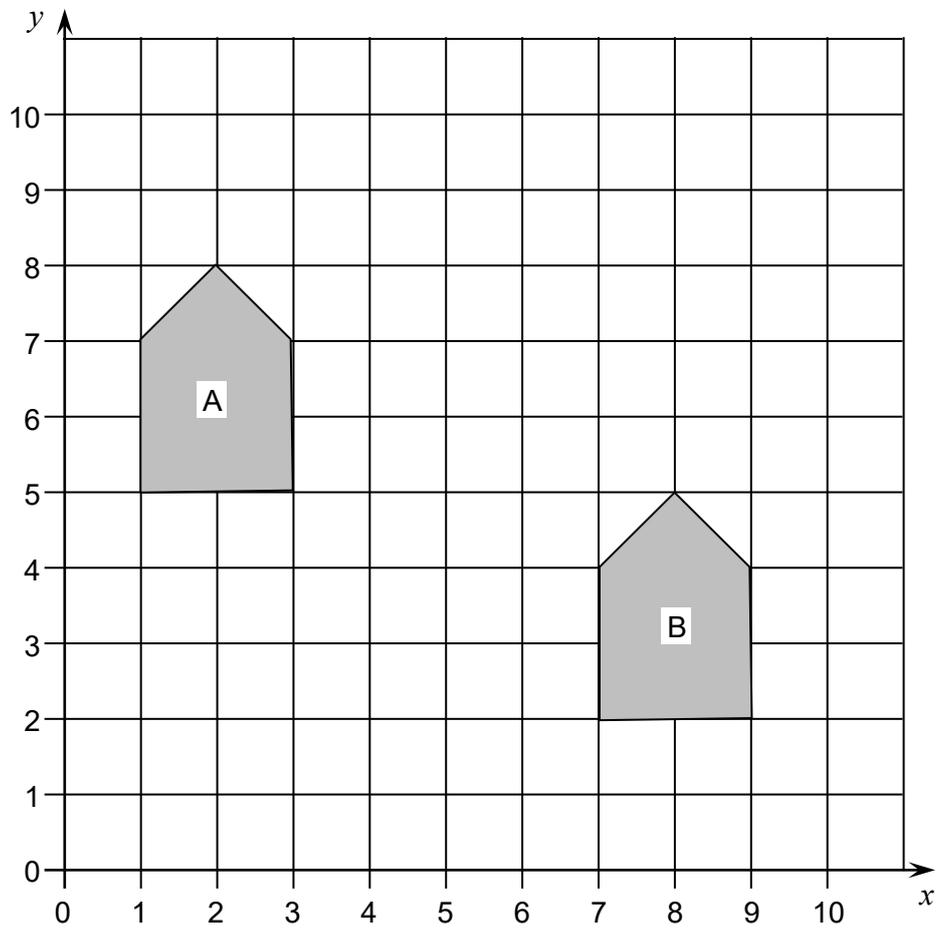
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$c =$  \_\_\_\_\_

8 Work out the transformation that maps shape A to shape B.



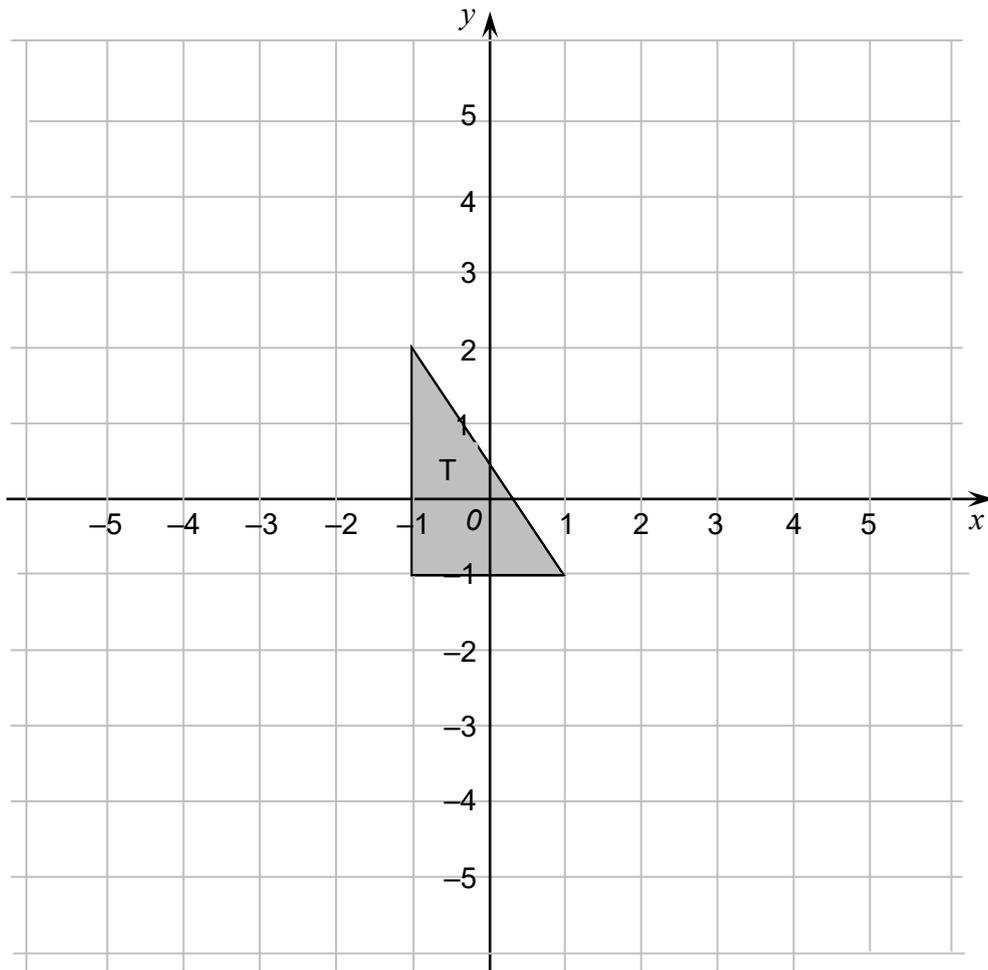
[2 marks]

Answer  $\left( \quad \right)$

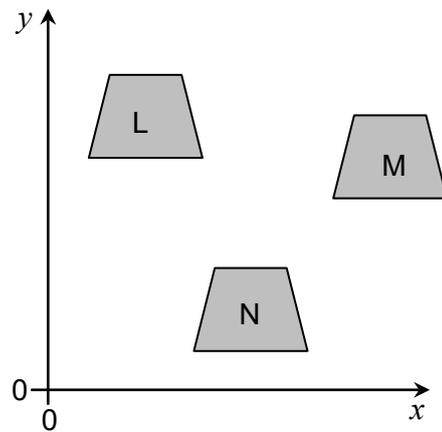
- 9 Triangle T is mapped to triangle R by a translation of  $\begin{pmatrix} -3 \\ -2 \end{pmatrix}$

Draw triangle R on the grid.

[2 marks]



10



Not drawn accurately

Shape L is mapped to shape M by the vector  $\begin{pmatrix} 4 \\ -3 \end{pmatrix}$

Shape M is mapped to shape N by the vector  $\begin{pmatrix} -3 \\ -5 \end{pmatrix}$

Work out the vector that maps shape L to shape N.

[2 marks]

Answer  $\begin{pmatrix} \phantom{0} \\ \phantom{0} \end{pmatrix}$