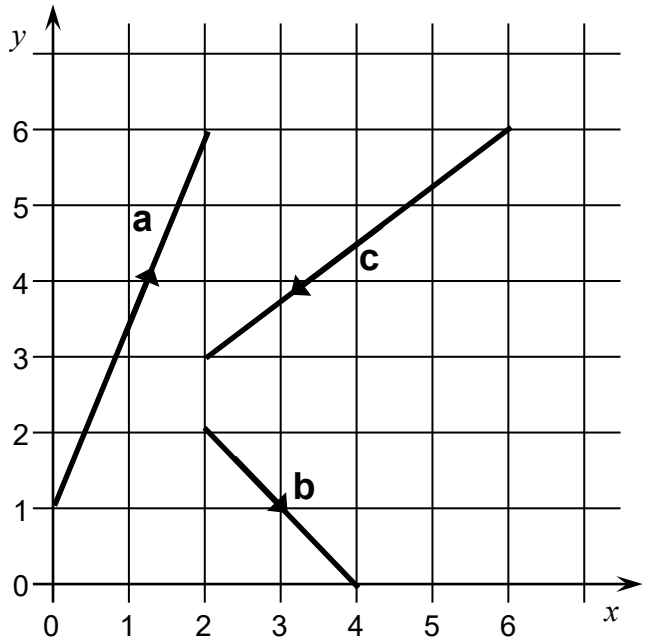
Topic Test 1 (20 minutes)

Vectors - Higher

Use this diagram to answer questions 1 and 2

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



1 Write, in column form, the vector that is

parallel to **b**
twice as long as **b.**

[1 mark]

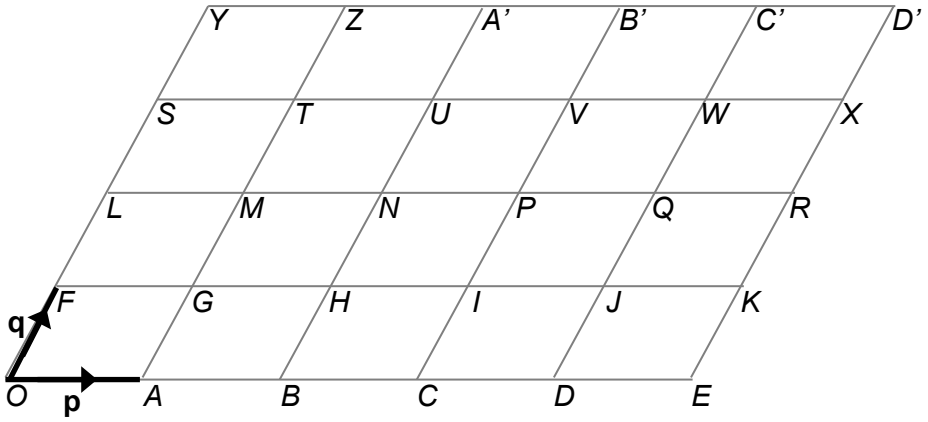
Answer ( )

2 Which of the following is true?
Circle your answer.

[1 mark]

a = b + c **a – b = c** **a + b + c = 0** **a + b = c**

3 Two vectors **p** and **q** are shown on the grid.



3 (a) Write, in letters, any vector equal to 2**p** – 4**q**

[1 mark]

Answer _____

3 (b) Draw, on the diagram, the vector representation of

(**p** – 2**q**) + (–2**p** + **q**) = –(**p** + **q**)

[2 marks]

4 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]

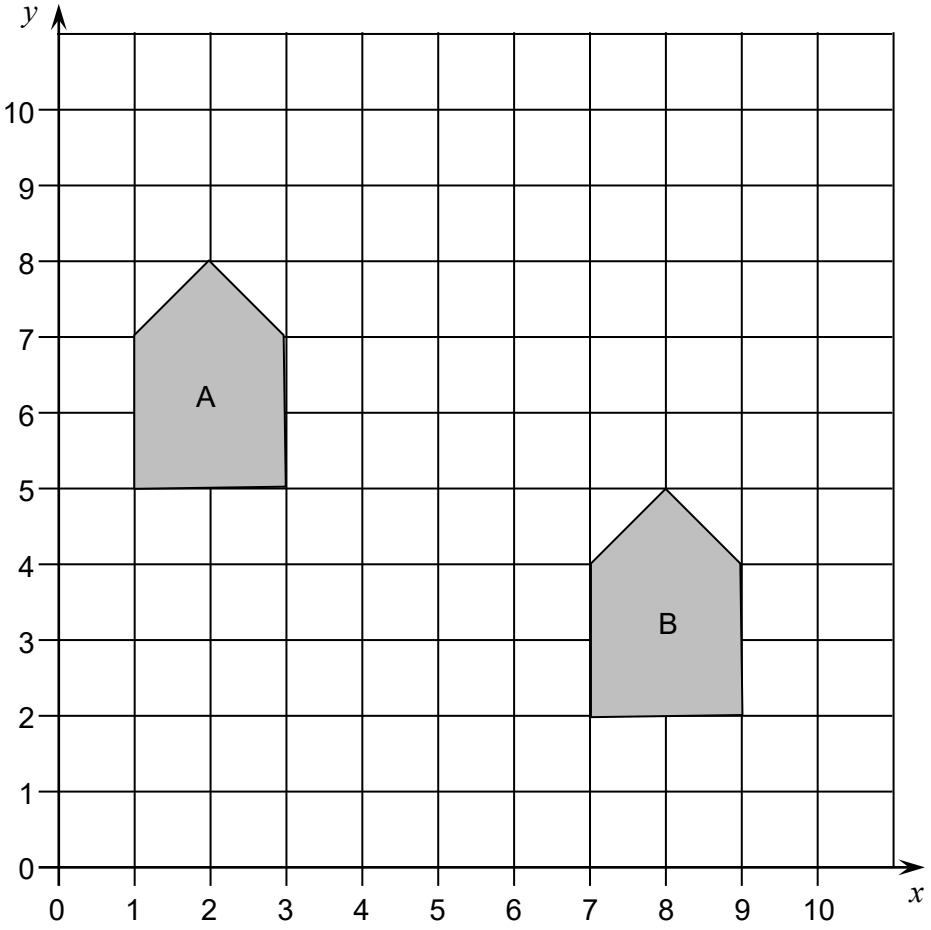
_____

_____

_____

$c =$ _____

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



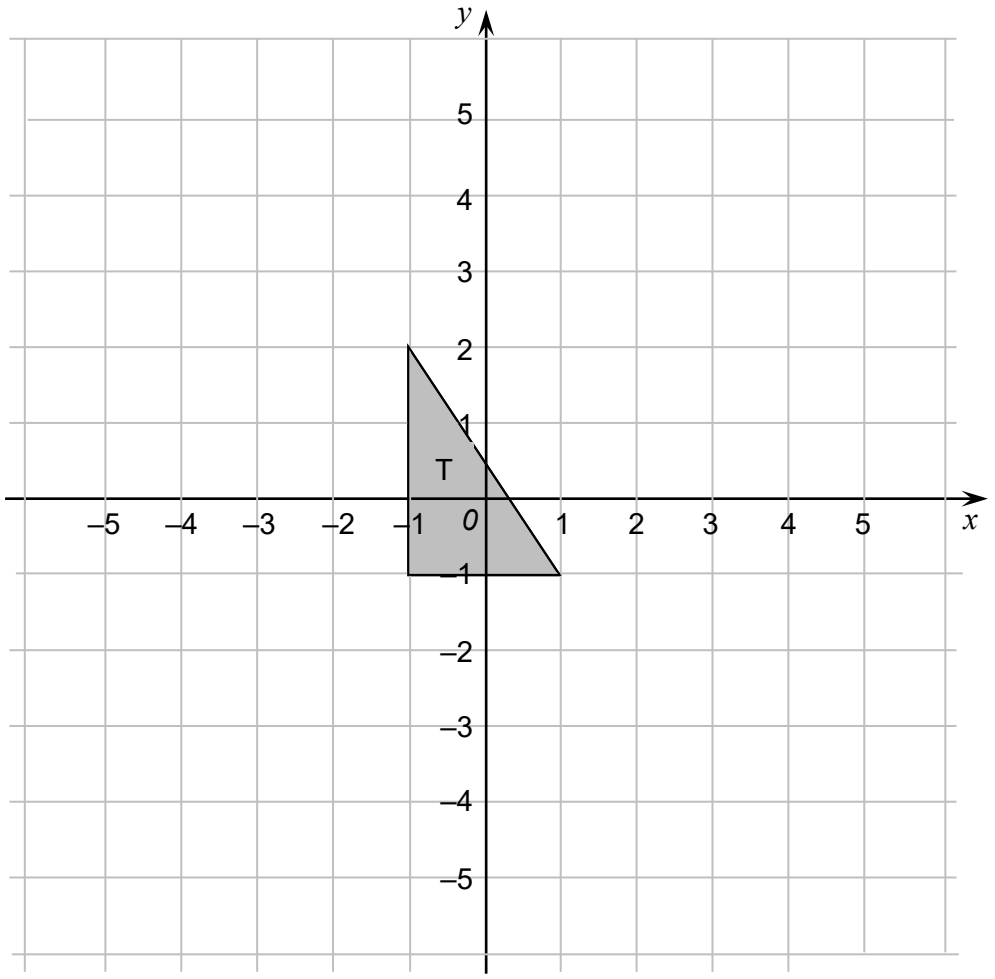
[2 marks]

Answer ( )

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

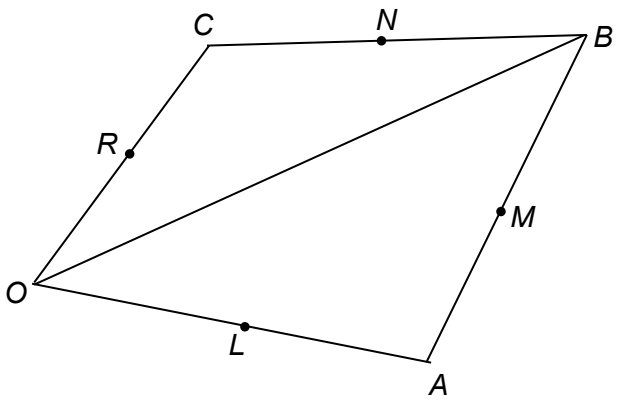
Draw triangle R on the grid.

[2 marks]



7 *OABC* is a quadrilateral.
L, M, N and *R* are the midpoints of *OA*, *AB*, *BC* and *OC* respectively.

$\overrightarrow{OA} = \mathbf{a}$, $\overrightarrow{OB} = \mathbf{b}$ and $\overrightarrow{OC} = \mathbf{c}$.



Not drawn accurately

Work out the following vectors in terms of **a**, **b** and **c**.

7 (a) $\overrightarrow{OR}$

[1 mark]

Answer _____

7 (b) $\overrightarrow{CN}$

[1 mark]

Answer _____

7 (c) $\overrightarrow{LM}$

[2 marks]

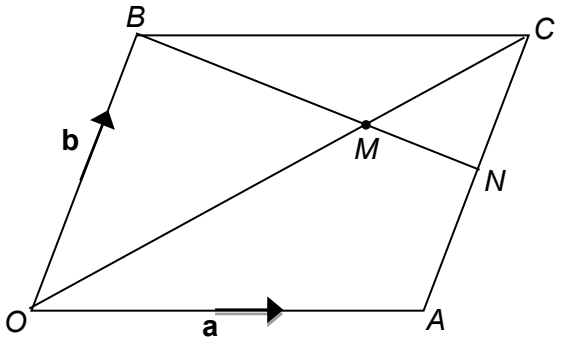
Answer _____

8 *OACB* is a parallelogram.

$\overrightarrow{OA} = \mathbf{a}$, $\overrightarrow{OB} = \mathbf{b}$

M is on *OC* such that *OM* : *MC* = 3 : 1

BM is extended to meet *AC* at *N*.



Not drawn accurately

8 (a) Write $\overrightarrow{OM}$ in terms of **a** and **b**.

[1 mark]

Answer _____

8 (b) Write $\overrightarrow{BM}$ in terms of **a** and **b**.

[2 marks]

Answer _____

8 (c) Given that $BM : MN = 3 : 1$, show that $AC : NC = 3 : 1$

[3 marks]