

Vectors

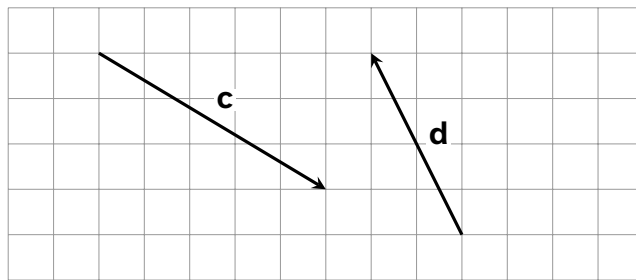
For Pearson Edexcel GCSE Mathematics (1MA1) • Foundation tier

Name _____

Total marks: **21**

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

1 The vectors **c** and **d** are shown on the grid.



(a) Write **c** as a column vector.

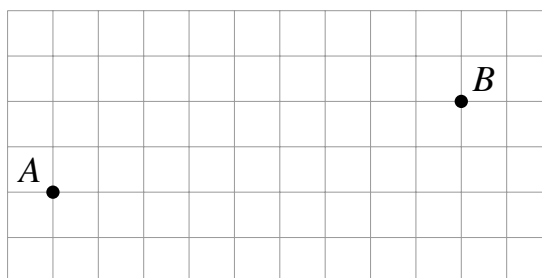
$$\begin{pmatrix} \\ \end{pmatrix} \quad (1)$$

(b) Write **d** as a column vector.

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

(Total for Question 1 is 2 marks)

2 $\mathbf{e} = \begin{pmatrix} 2 \\ 1 \end{pmatrix}$



- (a) On the grid, draw and label the vector $2\mathbf{e}$ starting at point A .

(1)

- (b) On the grid, draw and label the vector $-\mathbf{e}$ starting at point B .

(1)

(Total for Question 2 is 2 marks)

3 $\mathbf{a} = \begin{pmatrix} 3 \\ -2 \end{pmatrix}$ $\mathbf{b} = \begin{pmatrix} -1 \\ 6 \end{pmatrix}$

(a) Work out $\mathbf{a} + \mathbf{b}$ as a column vector.

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

(b) Work out $4\mathbf{a}$ as a column vector.

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

(c) Work out $2\mathbf{a} - \mathbf{b}$ as a column vector.

$$\begin{pmatrix} \\ \end{pmatrix} \quad (2)$$

(Total for Question 3 is 4 marks)

4 $\mathbf{f} = \begin{pmatrix} -1 \\ 4 \end{pmatrix}$ $\mathbf{g} = \begin{pmatrix} 5 \\ -2 \end{pmatrix}$

Work out $3\mathbf{f} + 2\mathbf{g}$ as a column vector.

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

(2)

(Total for Question 4 is 2 marks)

5 Which of these vectors is parallel to $\begin{pmatrix} 2 \\ -3 \end{pmatrix}$?

Tick the vector.

☐ $\begin{pmatrix} 3 \\ -2 \end{pmatrix}$

☐ $\begin{pmatrix} -3 \\ 2 \end{pmatrix}$

☐ $\begin{pmatrix} 6 \\ -9 \end{pmatrix}$

☐ $\begin{pmatrix} 4 \\ -1 \end{pmatrix}$

(1)

(Total for Question 5 is 1 mark)

6 $\overrightarrow{PQ} = \begin{pmatrix} 4 \\ -3 \end{pmatrix}$

P is the point $(2, 5)$.

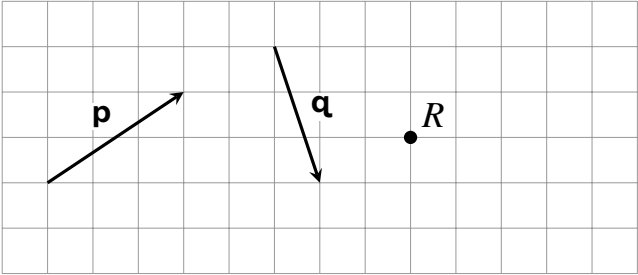
Work out the coordinates of Q .

(..... ,)

(2)

(Total for Question 6 is 2 marks)

7 The vectors $\mathbf{p}$ and $\mathbf{q}$ are drawn on the grid.



From the point R , draw the vector $\mathbf{p} + \mathbf{q}$

(2)

(Total for Question 7 is 2 marks)

- 8 $ABCD$ is a trapezium.
 DC is parallel to AB , and DC is 3 times as long as AB .
 $\overrightarrow{AB} = \mathbf{p}$ and $\overrightarrow{AD} = \mathbf{q}$

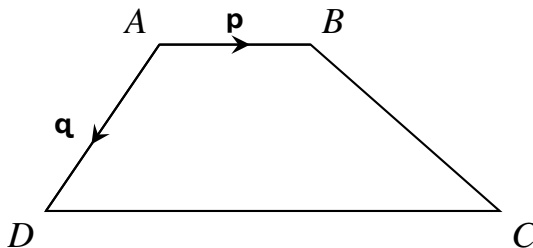


Diagram **NOT** accurately drawn

- (a) Find, in terms of $\mathbf{p}$, the vector $\overrightarrow{DC}$

.....
 (1)

- (b) Find, in terms of $\mathbf{p}$ and $\mathbf{q}$, the vector $\overrightarrow{BD}$

.....
 (1)

- (c) Find, in terms of $\mathbf{p}$ and $\mathbf{q}$, the vector $\overrightarrow{BC}$

.....
 (1)

(Total for Question 8 is 3 marks)

9 A is the point $(-1, 4)$.

$$\overrightarrow{AB} = 3\mathbf{u} - \mathbf{w} \text{ where } \mathbf{u} = \begin{pmatrix} 2 \\ -1 \end{pmatrix} \text{ and } \mathbf{w} = \begin{pmatrix} 3 \\ 5 \end{pmatrix}$$

Work out the coordinates of B .

(..... ,)

(3)

(Total for Question 9 is 3 marks)
