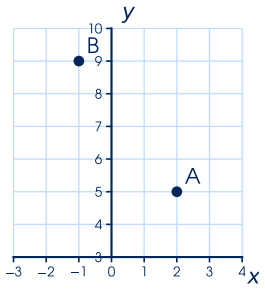
GCSE HIGHER · REVISION MAT 5

Vectors

1 $\mathbf{a} = \begin{pmatrix} 4 \\ 0 \end{pmatrix}$ and $\mathbf{b} = \begin{pmatrix} -1 \\ 3 \end{pmatrix}$

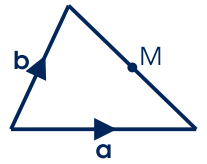
Find $2\mathbf{a} + 3\mathbf{b}$.

2 Write down the vector from A(2, 5) to B(−1, 9).



3 Explain why $\begin{pmatrix} 0 \\ 5 \end{pmatrix}$ is a vertical vector.

4 M is the midpoint of AB.

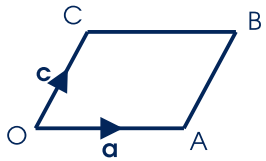


Find BM in terms of **a** and **b**.

5 $\mathbf{p} = \begin{pmatrix} 6 \\ 9 \end{pmatrix}$.

Show that **p** is parallel to $\begin{pmatrix} 2 \\ 3 \end{pmatrix}$.

6 OABC is a parallelogram. N lies on AC with AN : NC = 1 : 2.



Find ON in terms of **a** and **c**.

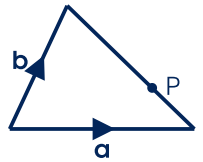
7 Show that the vectors $\begin{pmatrix} 3 \\ -1 \end{pmatrix}$ and $\begin{pmatrix} -6 \\ 2 \end{pmatrix}$ point in opposite directions.

8 OA = **a**, OB = **b**.

P is on AB with AP : PB = 1 : 2.

Q is such that OQ = $4\mathbf{a} - \mathbf{b}$.

Prove that P, A and Q lie on a straight line.



Mr&Mrs MATHS

ANSWERS · REVISION MAT 5

Vectors

1 $\begin{pmatrix}8\\0\end{pmatrix} + \begin{pmatrix}-3\\9\end{pmatrix}$

$\begin{pmatrix}5\\9\end{pmatrix}$

2 $\begin{pmatrix}-3\\4\end{pmatrix}$

3 It has no horizontal movement.

4 $BA = \mathbf{a} - \mathbf{b}$

$BM = \frac{1}{2}(\mathbf{a} - \mathbf{b})$

5 $\mathbf{p} = 3\begin{pmatrix}2\\3\end{pmatrix}$

6 $ON = \mathbf{a} + \frac{1}{3}(\mathbf{c} - \mathbf{a})$

$ON = \frac{2}{3}\mathbf{a} + \frac{1}{3}\mathbf{c}$

7 $\begin{pmatrix}-6\\2\end{pmatrix} = -2\begin{pmatrix}3\\-1\end{pmatrix}$

: a negative multiple

8 $AP = \frac{1}{3}(\mathbf{b} - \mathbf{a})$

$AQ = 3\mathbf{a} - \mathbf{b} = -3 \times \frac{1}{3}(\mathbf{b} - \mathbf{a})$

AQ = −3AP, so P, A, Q are collinear.

Mr&Mrs MATHS