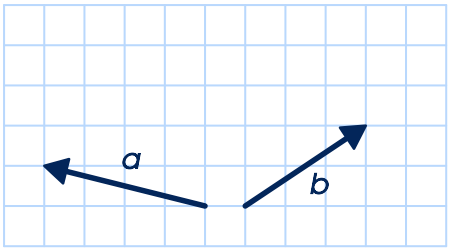
GCSE FOUNDATION · REVISION MAT 5

Vectors

1 Write the vectors **a** and **b** as column vectors.



2 $\mathbf{a} = \begin{pmatrix} 1 \\ 7 \end{pmatrix}$ $\mathbf{b} = \begin{pmatrix} 4 \\ -2 \end{pmatrix}$

Work out

(a) $\mathbf{a} + \mathbf{b}$ (b) $3\mathbf{a}$

3 Are the vectors $\begin{pmatrix} 5 \\ 2 \end{pmatrix}$ and $\begin{pmatrix} 10 \\ 5 \end{pmatrix}$ parallel?

Explain your answer.

4 $\mathbf{c} = \begin{pmatrix} 1 \\ -4 \end{pmatrix}$ $\mathbf{d} = \begin{pmatrix} 3 \\ 2 \end{pmatrix}$

Show that $3\mathbf{c} - 2\mathbf{d} = \begin{pmatrix} -3 \\ -16 \end{pmatrix}$

5 P is the point (−1, 0). P is translated to Q (4, 3).

(a) Write down the vector that translates P to Q.

(b) Q is then translated by $\begin{pmatrix} -2 \\ -5 \end{pmatrix}$ to R. Find the coordinates of R.

(c) Write the vector that translates P to R.

6 $x\begin{pmatrix} 5 \\ -1 \end{pmatrix} + \begin{pmatrix} 2 \\ y \end{pmatrix} = \begin{pmatrix} 17 \\ 3 \end{pmatrix}$

Work out the values of x and y.

Mr&Mrs MATHS

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

2 (a) $\begin{pmatrix} 5 \\ 5 \end{pmatrix}$ (b) $\begin{pmatrix} 3 \\ 21 \end{pmatrix}$

3 **No**: there is no single number that multiplies $\begin{pmatrix} 5 \\ 2 \end{pmatrix}$ to give $\begin{pmatrix} 10 \\ 5 \end{pmatrix}$.

ANSWERS · REVISION MAT 5

Vectors

4 $3\mathbf{c} = \begin{pmatrix} 3 \\ -12 \end{pmatrix}$, $2\mathbf{d} = \begin{pmatrix} 6 \\ 4 \end{pmatrix}$

$\begin{pmatrix} 3 \\ -12 \end{pmatrix} - \begin{pmatrix} 6 \\ 4 \end{pmatrix} = \begin{pmatrix} \mathbf{-3} \\ \mathbf{-16} \end{pmatrix}$ ✓

5 (a) $\begin{pmatrix} 5 \\ 3 \end{pmatrix}$

(b) R = **(2, −2)**

(c) $\begin{pmatrix} 3 \\ -2 \end{pmatrix}$

6 Top: $5x + 2 = 17$, so $\boldsymbol{x = 3}$

Bottom: $3 \times -1 + y = 3$, so $\boldsymbol{y = 6}$

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