

$$1. \quad \mathbf{a} = \begin{pmatrix} 5 \\ 2 \end{pmatrix} \quad \mathbf{b} = \begin{pmatrix} -1 \\ 7 \end{pmatrix}$$

Work out $2\mathbf{a} + \mathbf{b}$ as a column vector.

$$2\mathbf{a} = \begin{pmatrix} 5 \times 2 \\ 2 \times 2 \end{pmatrix} = \begin{pmatrix} 10 \\ 4 \end{pmatrix} \quad \text{① Multiply both the top and bottom by 2.}$$

$$\begin{pmatrix} 10 \\ 4 \end{pmatrix} + \begin{pmatrix} -1 \\ 7 \end{pmatrix} = \begin{pmatrix} 10 - 1 \\ 4 + 7 \end{pmatrix} = \begin{pmatrix} 9 \\ 11 \end{pmatrix}$$

$$2\mathbf{a} + \mathbf{b} =$$

$$\begin{pmatrix} 9 \\ 11 \end{pmatrix} \quad \text{①}$$

(Total for Question is 2 marks)

2. $\mathbf{a} = \begin{pmatrix} 3 \\ 4 \end{pmatrix}$ $\mathbf{b} = \begin{pmatrix} 5 \\ -2 \end{pmatrix}$

Find $2\mathbf{a} - 3\mathbf{b}$ as a column vector.

$$\begin{pmatrix} a \\ b \end{pmatrix} + \begin{pmatrix} c \\ d \end{pmatrix} = \begin{pmatrix} a+c \\ b+d \end{pmatrix}$$

$$k \begin{pmatrix} x \\ y \end{pmatrix} = \begin{pmatrix} kx \\ ky \end{pmatrix}$$

$$2 \begin{pmatrix} 3 \\ 4 \end{pmatrix} - 3 \begin{pmatrix} 5 \\ -2 \end{pmatrix}$$

$$\begin{pmatrix} 6 \\ 8 \end{pmatrix} - \begin{pmatrix} 15 \\ -6 \end{pmatrix} = \begin{pmatrix} -9 \\ 14 \end{pmatrix} \checkmark_1 \checkmark_2$$

$$\begin{pmatrix} -9 \\ \dots \\ 14 \end{pmatrix}$$

(Total for Question is 2 marks)