

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

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

$$(i) \quad \mathbf{a} + \mathbf{b} = \begin{pmatrix} 2 \\ 3 \end{pmatrix} + \begin{pmatrix} -1 \\ 2 \end{pmatrix} = \begin{pmatrix} 1 \\ 5 \end{pmatrix}$$

$$\begin{pmatrix} 1 \\ 5 \end{pmatrix}$$

(1) ①

(ii) $2\mathbf{a} - \mathbf{c}$

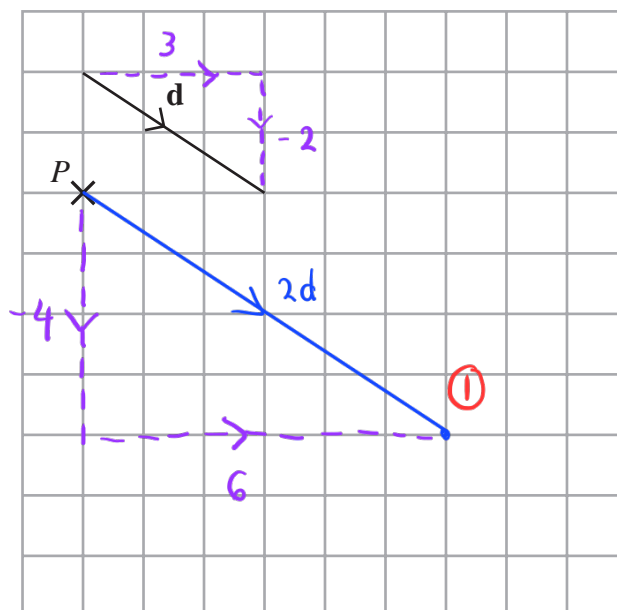
multiply inside

$$\begin{aligned} & 2 \begin{pmatrix} 2 \\ 3 \end{pmatrix} - \begin{pmatrix} 4 \\ 1 \end{pmatrix} \quad \text{①} \\ & = \begin{pmatrix} 4 \\ 6 \end{pmatrix} - \begin{pmatrix} 4 \\ 1 \end{pmatrix} = \begin{pmatrix} 0 \\ 5 \end{pmatrix} \quad \text{①} \end{aligned}$$

$$\begin{pmatrix} 0 \\ 5 \end{pmatrix}$$

(2)

The vector \mathbf{d} is drawn on the grid.



$$d = \begin{pmatrix} 3 \\ -2 \end{pmatrix}$$

$$2d = \begin{pmatrix} 6 \\ -4 \end{pmatrix}$$

(b) From the point P , draw the vector $2\mathbf{d}$

(1)

(Total for Question 1 is 4 marks)