

**6** You are given that  $\mathbf{v} = 2\mathbf{a} + 3\mathbf{b}$ , where  $\mathbf{a}$  and  $\mathbf{b}$  are the position vectors

$$\mathbf{a} = \begin{pmatrix} 5 \\ 3 \end{pmatrix} \text{ and } \mathbf{b} = \begin{pmatrix} -1 \\ 6 \end{pmatrix}.$$

**(a)** Determine the magnitude of  $\mathbf{v}$ . **[3]**

**(b)** Determine the angle between  $\mathbf{v}$  and the vector  $\begin{pmatrix} 1 \\ 0 \end{pmatrix}$ . **[2]**