**(Pass Year 2020) Chapter 29 Vectors**

**Oct/Nov 2020 P33/Q6b**

**(b)** $\mathbf{a} = \begin{pmatrix} 3 \\ -2 \end{pmatrix}$ $\mathbf{b} = \begin{pmatrix} 5 \\ 7 \end{pmatrix}$ $\mathbf{c} = \begin{pmatrix} -1 \\ 4 \end{pmatrix}$

Work out.

**(i)** $\mathbf{a} + \mathbf{b}$

$\begin{pmatrix} \quad \\ \quad \end{pmatrix}$ [1]

**(ii)** $\mathbf{b} - 2\mathbf{c}$

$\begin{pmatrix} \quad \\ \quad \end{pmatrix}$ [2]

**(c)** Point $P$ has coordinates $(6, -2)$ and $\overrightarrow{PQ} = \begin{pmatrix} -4 \\ 5 \end{pmatrix}$.

Find the coordinates of point $Q$.

(..... , .....) [1]

**Oct/Nov 2020 P43/Q8a**

**(a)** $\overrightarrow{AB} = \begin{pmatrix} 6 \\ -1 \end{pmatrix}$ $\overrightarrow{BC} = \begin{pmatrix} -2 \\ 5 \end{pmatrix}$ $\overrightarrow{DC} = \begin{pmatrix} 2 \\ -3 \end{pmatrix}$

Find

**(i)** $\overrightarrow{AC}$,

$\overrightarrow{AC} = \begin{pmatrix} \quad \\ \quad \end{pmatrix}$ [2]

**(ii)** $\overrightarrow{BD}$,

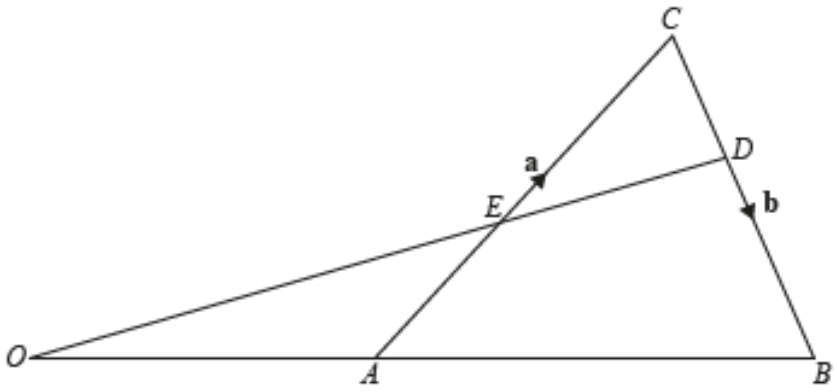
$\overrightarrow{BD} = \begin{pmatrix} \quad \\ \quad \end{pmatrix}$ [2]

**(iii)** $\left|\overrightarrow{BC}\right|$.

..... [2]

**Oct/Nov 2020 P43/Q8b**

**(b)**




NOT TO SCALE

In the diagram, $OAB$ and $OED$ are straight lines.
$O$ is the origin, $A$ is the midpoint of $OB$ and $E$ is the midpoint of $AC$.
$\overrightarrow{AC} = \mathbf{a}$ and $\overrightarrow{CB} = \mathbf{b}$.

Find, in terms of **a** and **b**, in its simplest form

**(i)** $\overrightarrow{AB}$,

$\overrightarrow{AB}$ = ..... [1]

**(ii)** $\overrightarrow{OE}$,

$\overrightarrow{OE}$ = ..... [2]

**(iii)** the position vector of $D$.

..... [3]