

VECTORS

CALCULATOR

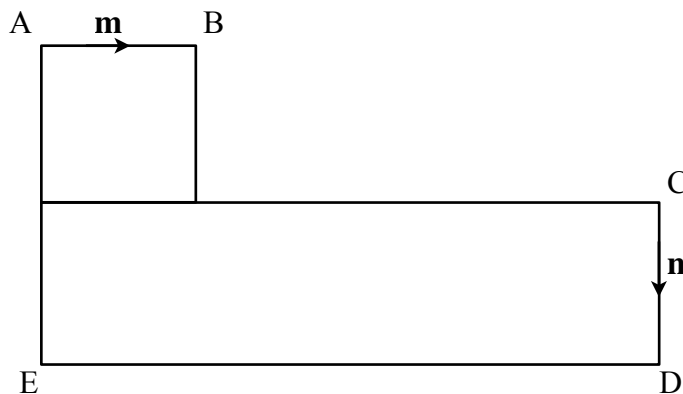
1) Let $\mathbf{a} = \begin{pmatrix} 4 \\ 2 \end{pmatrix}$ and $\mathbf{b} = \begin{pmatrix} -3 \\ 1 \end{pmatrix}$. On squared paper draw the following resultant vectors.

- a) $\mathbf{a} + \mathbf{b}$ b) $\mathbf{a} - \mathbf{b}$ c) $3\mathbf{a} + 2\mathbf{b}$

2) If $\mathbf{a} = \begin{pmatrix} 1 \\ 2 \\ 4 \end{pmatrix}$, $\mathbf{b} = \begin{pmatrix} 3 \\ -2 \\ 5 \end{pmatrix}$ and $\mathbf{c} = \begin{pmatrix} -3 \\ 1 \\ 2 \end{pmatrix}$ then calculate the following.

- a) $\mathbf{a} + \mathbf{b}$ b) $\mathbf{b} + \mathbf{c}$ c) $4\mathbf{a}$
 d) $5\mathbf{c} - \mathbf{b}$ e) $3\mathbf{b} + 2\mathbf{a}$ f) $4\mathbf{a} + 6\mathbf{c} - 3\mathbf{b}$
 g) $|\mathbf{a}|$ h) $|\mathbf{b} + \mathbf{c}|$ i) $|5\mathbf{c} - 2\mathbf{a} + 4\mathbf{b}|$

3) The diagram below shows a square on top of a rectangle. The square and the rectangle have the same breadth and the rectangle is 4 times longer than the square.



- $\overrightarrow{AB} = \mathbf{m}$
- $\overrightarrow{CD} = \mathbf{n}$

Express \overrightarrow{AD} in terms of \mathbf{m} and \mathbf{n} .