

VECTORS IN COMPONENT FORM

All the questions below refer to the following three vectors:

$$\mathbf{a} = \begin{pmatrix} 3 \\ 4 \end{pmatrix} \quad \mathbf{b} = \begin{pmatrix} 8 \\ -6 \end{pmatrix} \quad \mathbf{c} = \begin{pmatrix} -5 \\ 0 \end{pmatrix}$$

- 1)(a) Draw on squared paper the vectors \mathbf{a} and \mathbf{b} "nose to tail", and draw in the vector $\mathbf{a} + \mathbf{b}$. What are the components of $\mathbf{a} + \mathbf{b}$?
(b) Repeat (a) with vectors \mathbf{b} and \mathbf{c}
(c) Draw separately on squared paper the vectors $2\mathbf{b}$, \mathbf{a} and $-\mathbf{c}$.
(d) Draw on squared paper the vectors $3\mathbf{a}$ and $2\mathbf{b}$ "nose to tail", and draw in the vector $3\mathbf{a} + 2\mathbf{b}$. What are the components of $3\mathbf{a} + 2\mathbf{b}$?
(e) Draw on squared paper the vectors $2\mathbf{b}$ and $-\mathbf{c}$ "nose to tail", and draw in the vector $2\mathbf{b} - \mathbf{c}$. What are the components of $2\mathbf{b} - \mathbf{c}$?
- 2) Without drawing, calculate the components of the following vectors:
(a) $\mathbf{a} + \mathbf{c}$ (b) $4\mathbf{a} + 3\mathbf{b}$ (c) $\mathbf{a} + 2\mathbf{c}$ (d) $\mathbf{a} - \mathbf{b}$
- 3) The symbol $|\mathbf{a}|$ means "the LENGTH of vector \mathbf{a} " Use Pythagoras to find $|\mathbf{a}|$ and $|\mathbf{b}|$. State the value of $|\mathbf{c}|$.

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