Finding the Resultant by Adding Vectors

Click here for Free N5 Maths by Topic

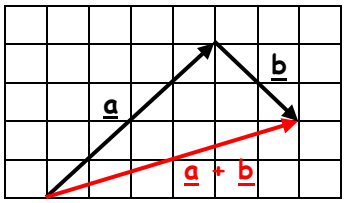
- **The resultant** is the vector that 'results' from adding two or more vectors together e.g. $\underline{a} + \underline{b}$

e.g. if $\underline{a} = \begin{pmatrix} 4 \\ 4 \end{pmatrix}$ and $\underline{b} = \begin{pmatrix} 2 \\ -2 \end{pmatrix}$

then $\underline{a} + \underline{b} = \begin{pmatrix} 4 \\ 4 \end{pmatrix} + \begin{pmatrix} 2 \\ -2 \end{pmatrix} = \begin{pmatrix} 6 \\ 2 \end{pmatrix}$

- **The resultant** can also be shown by lining up the head of the one vector with the tail of the other.

e.g. $\underline{a} + \underline{b}$



Triangle law - the directional arrows are really important

Show $\underline{a} + \underline{b}$ (i) as an addition of column vectors
(ii) using the triangle law of vector addition

1. If $\underline{a} = \begin{pmatrix} 4 \\ 2 \end{pmatrix}$ and $\underline{b} = \begin{pmatrix} 1 \\ 3 \end{pmatrix}$

1. $\begin{pmatrix} 4 \\ 2 \end{pmatrix} + \begin{pmatrix} 1 \\ 3 \end{pmatrix} =$ ☐

2. If $\underline{a} = \begin{pmatrix} 6 \\ 3 \end{pmatrix}$ and $\underline{b} = \begin{pmatrix} -2 \\ 2 \end{pmatrix}$

2. $\begin{pmatrix} 6 \\ 3 \end{pmatrix} + \begin{pmatrix} -2 \\ 2 \end{pmatrix} =$ ☐

3. If $\underline{a} = \begin{pmatrix} 3 \\ -5 \end{pmatrix}$ and $\underline{b} = \begin{pmatrix} 2 \\ 3 \end{pmatrix}$

3. $\begin{pmatrix} 3 \\ -5 \end{pmatrix} + \begin{pmatrix} 2 \\ 3 \end{pmatrix} =$ ☐

4. If $\underline{a} = \begin{pmatrix} 2 \\ 5 \end{pmatrix}$ and $\underline{b} = \begin{pmatrix} 4 \\ -2 \end{pmatrix}$

4. $\begin{pmatrix} 2 \\ 5 \end{pmatrix} + \begin{pmatrix} 4 \\ -2 \end{pmatrix} =$ ☐

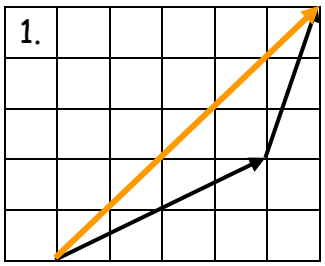
5. If $\underline{a} = \begin{pmatrix} 1 \\ -4 \end{pmatrix}$ and $\underline{b} = \begin{pmatrix} 3 \\ 0 \end{pmatrix}$

5. $\begin{pmatrix} 1 \\ -4 \end{pmatrix} + \begin{pmatrix} 3 \\ 0 \end{pmatrix} =$ ☐

ANSWERS

Show a + b (i) as an addition of column vectors
(ii) using the triangle law of vector addition

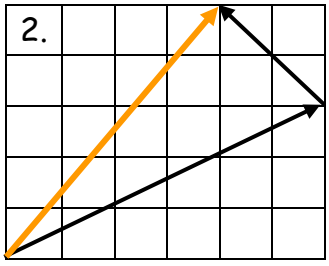
1. If a = $\begin{pmatrix} 4 \\ 2 \end{pmatrix}$ and b = $\begin{pmatrix} 1 \\ 3 \end{pmatrix}$



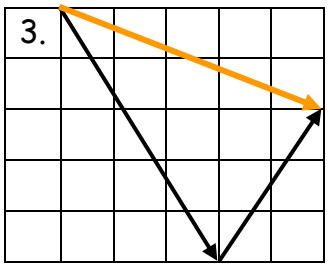
1. $\begin{pmatrix} 4 \\ 2 \end{pmatrix} + \begin{pmatrix} 1 \\ 3 \end{pmatrix} = \begin{pmatrix} 5 \\ 5 \end{pmatrix}$

2. If a = $\begin{pmatrix} 6 \\ 3 \end{pmatrix}$ and b = $\begin{pmatrix} -2 \\ 2 \end{pmatrix}$

2. $\begin{pmatrix} 6 \\ 3 \end{pmatrix} + \begin{pmatrix} -2 \\ 2 \end{pmatrix} = \begin{pmatrix} 4 \\ 5 \end{pmatrix}$



3. If a = $\begin{pmatrix} 3 \\ -5 \end{pmatrix}$ and b = $\begin{pmatrix} 2 \\ 3 \end{pmatrix}$

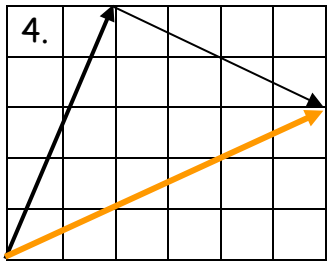


3. $\begin{pmatrix} 3 \\ -5 \end{pmatrix} + \begin{pmatrix} 2 \\ 3 \end{pmatrix} =$

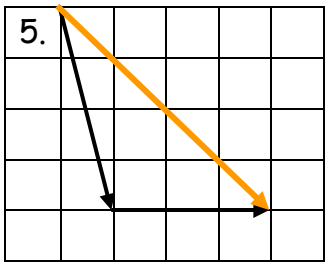
$\begin{pmatrix} 5 \\ -2 \end{pmatrix}$

4. If a = $\begin{pmatrix} 2 \\ 5 \end{pmatrix}$ and b = $\begin{pmatrix} 4 \\ -2 \end{pmatrix}$

4. $\begin{pmatrix} 2 \\ 5 \end{pmatrix} + \begin{pmatrix} 4 \\ -2 \end{pmatrix} = \begin{pmatrix} 6 \\ 3 \end{pmatrix}$



5. If a = $\begin{pmatrix} 1 \\ -4 \end{pmatrix}$ and b = $\begin{pmatrix} 3 \\ 0 \end{pmatrix}$



5. $\begin{pmatrix} 1 \\ -4 \end{pmatrix} + \begin{pmatrix} 3 \\ 0 \end{pmatrix} = \begin{pmatrix} 4 \\ -4 \end{pmatrix}$