Operations with Vectors

(Linear Combinations of Vectors)
2D Vectors

Solutions *can be found at the bottom of Exercise 1 (online notes). To get there, either click here:*
RadfordMathematics.com
or, if you've printed this worksheet out, by scanning the ***QR Code*** *in the upper right hand corner of the page.*

Exercise

Answer each of the following questions expressing your answer in component form:

1. Find $\vec{a} + \vec{b}$ where $\vec{a} = \begin{pmatrix} 1 \\ 4 \end{pmatrix}$ and $\vec{b} = \begin{pmatrix} 2 \\ 5 \end{pmatrix}$.
2. Find $\vec{c} - \vec{d}$ where $\vec{c} = \begin{pmatrix} 4 \\ 2 \end{pmatrix}$ and $\vec{d} = \begin{pmatrix} 1 \\ 5 \end{pmatrix}$.
3. Find $3\vec{u}$ where $\vec{u} = \begin{pmatrix} -2 \\ 7 \end{pmatrix}$.
4. Find $2\vec{a} + \vec{b}$ where $\vec{a} = \begin{pmatrix} -1 \\ 3 \end{pmatrix}$ and $\vec{b} = \begin{pmatrix} 4 \\ 6 \end{pmatrix}$.
5. Find $\vec{u} - 2\vec{v}$ where $\vec{u} = \begin{pmatrix} 5 \\ 0 \end{pmatrix}$ and $\vec{v} = \begin{pmatrix} 2 \\ -3 \end{pmatrix}$.
6. Find $4\vec{b} + 2\vec{c}$ where $\vec{b} = \begin{pmatrix} 3 \\ 4 \end{pmatrix}$ and $\vec{c} = \begin{pmatrix} -1 \\ 5 \end{pmatrix}$.
7. Find $-2\vec{a} + \vec{b}$ where $\vec{a} = \begin{pmatrix} 3 \\ 7 \end{pmatrix}$ and $\vec{b} = \begin{pmatrix} 6 \\ -2 \end{pmatrix}$.
8. Find $\vec{a} - 2\vec{b}$ where $\vec{a} = \begin{pmatrix} 3 \\ 4 \end{pmatrix}$ and $\vec{b} = \begin{pmatrix} 1 \\ 3 \end{pmatrix}$.
9. Find $4\vec{u} - 3\vec{v}$ where $\vec{u} = \begin{pmatrix} 4 \\ 5 \end{pmatrix}$ and $\vec{v} = \begin{pmatrix} 2 \\ 3 \end{pmatrix}$.
10. Find $\vec{a} + \vec{b} + \vec{c}$ where $\vec{a} = \begin{pmatrix} -2 \\ 3 \end{pmatrix}$, $\vec{b} = \begin{pmatrix} 4 \\ 5 \end{pmatrix}$ and $\vec{c} = \begin{pmatrix} 6 \\ -7 \end{pmatrix}$.
11. Find $2\vec{u} + \vec{v} - 3\vec{w}$ where $\vec{u} = \begin{pmatrix} 4 \\ 3 \end{pmatrix}$, $\vec{v} = \begin{pmatrix} 0 \\ -1 \end{pmatrix}$ and $\vec{w} = \begin{pmatrix} 2 \\ 2 \end{pmatrix}$.
12. Find $\vec{a} + 2\vec{b} - 3\vec{c}$ where $\vec{a} = \begin{pmatrix} 25 \\ 22 \end{pmatrix}$, $\vec{b} = \begin{pmatrix} 2 \\ 3 \end{pmatrix}$ and $\vec{c} = \begin{pmatrix} 4 \\ 5 \end{pmatrix}$.