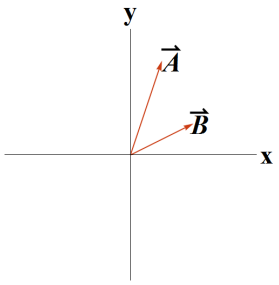
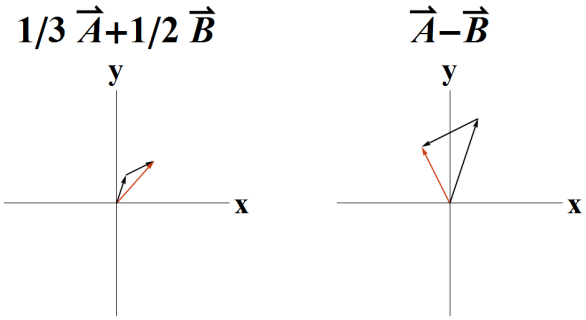
Discovery Exercise for Basis Vectors

The drawing below shows two vectors $\vec{A}$ and $\vec{B}$.



You can express any vector in the plane as $a\vec{A} + b\vec{B}$ where a and b are carefully chosen numbers. For instance, if you pick a point somewhere between the two, it might be $(1/3)\vec{A} + (1/2)\vec{B}$. A point in the second quadrant might be $\vec{A} + \left(-\vec{B}\right)$.



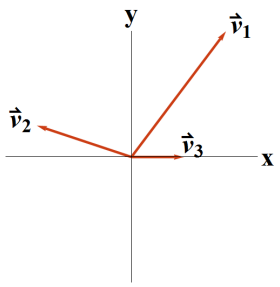
For this exercise your job is entirely visual: no calculations are involved, so your answers will be approximate.

1. Draw the vector $-\vec{A} + \vec{B}$.

2. Draw the vector $(1/2)\vec{A} + 2\vec{B}$.

3. Draw the vector $0\vec{A} + 0\vec{B}$.

4. The graph below shows three vectors. For each vector, estimate how many $\vec{A}$s and $\vec{B}$s would add up to that vector. In other words, find a and b to express each vector as $a\vec{A} + b\vec{B}$.



See Check Yourself #39 at felderbooks.com/checkyourself