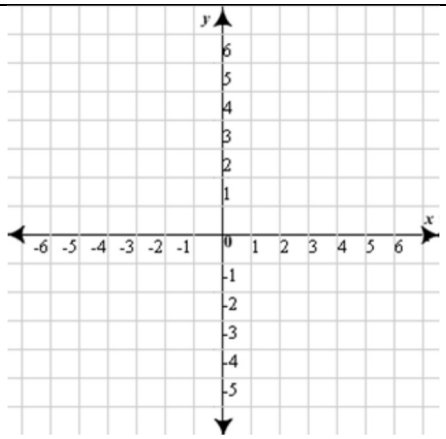
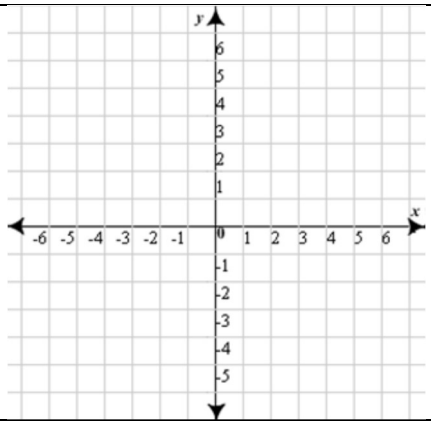
Operations on Vectors 15.3

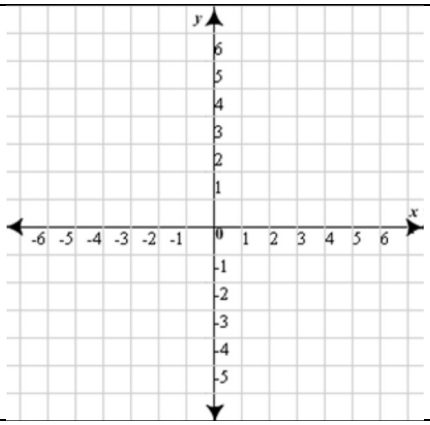
The sum of two vectors is called the _____.

End to End method $\vec{u} = \langle 5,4 \rangle$ and $\vec{v} = \langle 2,-9 \rangle$, find $\vec{u} + \vec{v}$. 1. Position u and v so that the terminal point of u coincides with the initial point of v. 2. The resultant vector, u+v, extends from the initial point of u to the terminal point of v.	
Component Wise method $\vec{u} = \langle 5,4 \rangle$ and $\vec{v} = \langle 2,-9 \rangle$, find $\vec{u} + \vec{v}$. 1. Add horizontal components 2. Add vertical components	
Parallelogram method $\vec{u} = \langle 5,4 \rangle$ and $\vec{v} = \langle 2,-9 \rangle$, find $\vec{u} + \vec{v}$. 1. Draw both vectors starting at a common point, forming two sides of a parallelogram. 2. Draw the other two sides. 3. Draw in a new vector from the common starting point to the opposite vertex of the parallelogram.	

Magnitudes and Vector Addition

The magnitude of the sum of two vectors is not equal to the sum of the magnitudes of the two vectors $\|u + v\| \neq \|u\| + \|v\|$.	$\vec{u} = \langle 5,4 \rangle$ and $\vec{v} = \langle 2,-9 \rangle$, find $\|u + v\| =$ $\|u\| + \|v\|=$

Subtracting Vectors

The difference of two vectors, v-u, is v+(-u). –u is the opposite direction of u.	

Multiply a vector by a scalar

We can stretch a vector by multiplying the vector by a scale factor. For example, $2\vec{v}$ represents the vector that has the same direction as $\vec{v}$, but whose magnitude is twice that of $\vec{v}$.

If $v = \langle 5,4 \rangle$ find: $6v$ and $-3v$

Scalar multiplication and magnitude

When multiplying a vector by a scalar the magnitude of kv (k is the scalar, v is the vector) is the magnitude of the vector times the absolute value of the scalar.

Find the magnitude of $6v$ and $-3v$