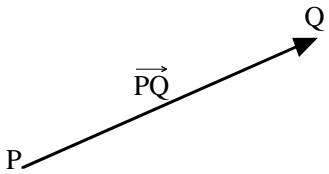
A204

Introduction of Vectors:

We represent vectors by drawing a **Directed Segment** (an arrow).
The starting point is called the **Initial Point**.
The ending point is called the **Terminal Point**.
We can name a vector by using the Initial Point and the Terminal Point with a vector symbol above.



The textbook also uses bold lowercase letters to denote vectors, such as vector **v**.
On paper we can use the arrow above lowercase letters to denote a vector, such as vector $\vec{v}$.

The **Length** of the vector is called its **Magnitude** or its **Absolute Value**.
The way that the vector is pointing is called its **Direction**.
When 2 vectors have the same direction and magnitude, they are **equivalent**.

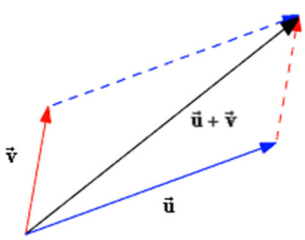
Suppose P(a, b) and Q(c, d) are the Initial and Terminal Points of vector $\overrightarrow{PQ}$. Then $\|PQ\| = \sqrt{(a-c)^2+(b-d)^2}$

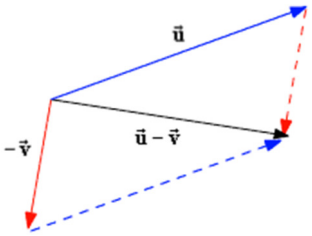
This is the vector's **Length** or **Absolute Value**.

The Slope of the Vector above is $\frac{b-d}{c-a}$.

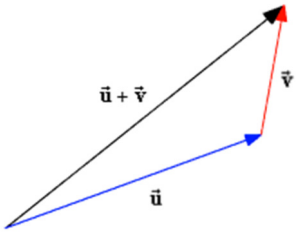
The **Component Form** of the vector from P(a, b) to Q(c, d) is given by the use of an ordered pair inside **Angle Brackets**. First the horizontal directed distance, then the vertical directed distance.
Ex: <c - a, d - b>

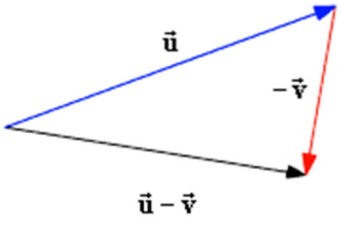
To add two vectors, $\vec{u}+\vec{v}$, by the **Parallelogram Method**, place the initial points together and make a parallelogram using these vectors as adjacent sides. The sum, called "resultant" is the diagonal vector from the terminal points to the opposite vertex. Examples of addition and subtraction are below.





To add two vectors, $\vec{u}+\vec{v}$, by the **Triangle Method**, place the initial point of $\vec{v}$ at the terminal point of $\vec{u}$. The sum is the vector from the initial point of $\vec{u}$ to the terminal point of $\vec{v}$. Examples of addition and subtraction are below.





Ex: Given a vector $\vec{v}$ with initial point at (4, 6) and terminal point at (-2, 13). Write the component form, and the magnitude of the vector.

Component form: $\langle -2-4, 13-6\rangle = \boxed{\langle -6, 7\rangle}$ **Magnitude** = $\sqrt{(-2-4)^2+(13-6)^2} = \sqrt{36+49} = \boxed{\sqrt{85}}$

Pre-Calculus 2 Assignment 204 Wednesday, February 4, 2015 Hour Name

Exer. 3-12: Find the **component form** and the **magnitude** of the vector v.

1. Initial point at (0, 0), Terminal point at (4, -2)
2. Initial point at (-1, -1), Terminal point at (3, 5)
3. Initial point at (-4, -1), Terminal point at (3, -1)
4. Initial point at $(-\frac{5}{2}, -2)$, Terminal point at $(1, \frac{2}{3})$

Exer. 5-6: Use the figure to sketch a graph of the specified vector..

5. u + v
6. $v - \frac{1}{2}u$