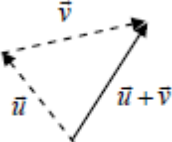
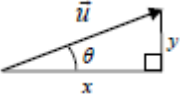


Polar Coordinates

Source: D.Lippman, M.Rasmussen (2012) *Precalculus: An Investigation of Functions* (Edition 1.3)

Complex Number	<p>Is a number $z = a + b * i$, where a and b are real numbers a is a real part of the complex number b is a imaginary part of the complex number i called an imaginary number</p> $i = \sqrt{-1}$
Complex Plane	<p>In the complex plane, the horizontal axis is the real axis and the vertical axis is the imaginary axis.</p>
Polar form of a complex number	$z = r * e^{i\theta}$ $r * e^{i\theta} = r\cos(\theta) + ir * \sin(\theta) \text{ (Euler's Formula)}$
Vector	<p>is an object that has both a length and a direction, \overline{AB}</p>
Adding Vectors Geometrically	<p>To add vectors geometrically, draw \vec{v} starting from the end of \vec{u}. The sum $\vec{u} + \vec{v}$ is the vector from the beginning of \vec{u} to the end of \vec{v}.</p> 
Scaling a Vector Geometrically	<p>To geometrically scale a vector by a constant, scale the length of the vector by the constant. Scaling a vector by a negative constant will reverse the direction of the vector.</p>
Magnitude and Direction of a Vector	<p>A vector \vec{u} can be described by its magnitude or length \vec{u} and an angle θ. A vector with length 1 is called unit vector.</p>
Component Form of a Vector	<p>The component form of a vector represents the vector using two components. $\vec{u} = \langle x, y \rangle$ indicates the vector represents a displacement of x units horizontally and y units vertically.</p> 
Combining Vectors in Component Form	<p>To add, subtract, or scale vector in component form If $\vec{u} = \langle u_1, u_2 \rangle$, $\vec{v} = \langle v_1, v_2 \rangle$, and c is any constant, then</p> $\vec{u} + \vec{v} = \langle u_1 + v_1, u_2 + v_2 \rangle$ $\vec{u} - \vec{v} = \langle u_1 - v_1, u_2 - v_2 \rangle$ $c\vec{u} = \langle cu_1, cu_2 \rangle$
Parametric Equations	<p>A system of parametric equations is a pair of functions $x(t)$ and $y(t)$ in which the x and y coordinates are the output, represented in terms of a third input parameter, t.</p>