

Magnet Precalculus CD
Vectors

Devin D. Drodgy

Contents

Chapter 1	Geometric Representation of Vectors	Page 2
1.1	Combination	2
1.2	Magnitude of Vectors	2
1.3	Unit Vector	2
1.4	Components of a Vector	2

Chapter 1

Geometric Representation of Vectors

1.1 Combination

1.2 Magnitude of Vectors

The magnitude (length) of a vector $v = \langle a, b \rangle$ is $\|v\| = \sqrt{a^2 + b^2}$. If vector v is represented by the arrow from (x_1, y_1) to (x_2, y_2) , then $\|v\| = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$.

1.3 Unit Vector

Definition 1.3.1: Unit Vector

A vector u for which $\|u\| = 1$ is called a **unit vector**.

$$u = \frac{v}{\|v\|}$$
$$i = \langle 1, 0 \rangle \text{ and } j = \langle 0, 1 \rangle$$

1.4 Components of a Vector

Let v be a vector with magnitude $\|v\|$ and direction θ . Then, $v = \langle a, b \rangle = ai + bj$ where $a = \|v\| \cos(\theta)$ and $b = \|v\| \sin(\theta)$. Therefore, we can express v as $v = \|v\| \cos(\theta)i + \|v\| \sin(\theta)j$