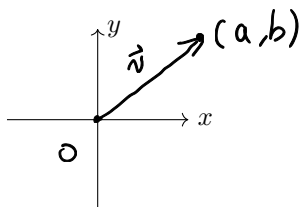


MATH 2D Prep: Vector Geometry

Facts to Know:

1. Drawing vectors:

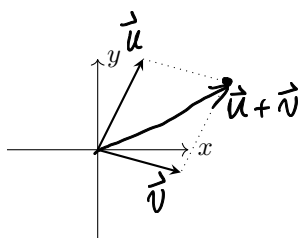
$$\vec{v} = (a, b)$$



2. Adding vectors:

$$\vec{u} = (a, b), \vec{v} = (c, d)$$

$$\vec{u} + \vec{v} = (a+c, b+d)$$

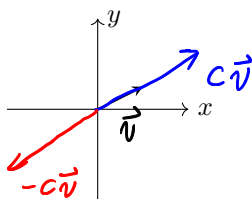


3. Scaling vectors: (Suppose $c > 0$)

$$\vec{v} = (a, b)$$

$$c\vec{v} = (ca, cb)$$

$$-c\vec{v} = (-ca, -cb)$$



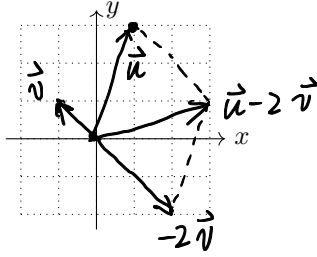
4. Length (magnitude) of vectors:

- $\vec{v} = (a, b), |\vec{v}| = \sqrt{a^2 + b^2}$

- Fact: $|\vec{c}\vec{v}| = \underbrace{|c|}_{\text{abs. value}} \cdot \underbrace{|\vec{v}|}_{\text{length of vector.}}$

Examples:

1. Given $\vec{u} = (1, 3)$ and $\vec{v} = (-1, 1)$, draw $\vec{u} - 2\vec{v} = \vec{u} + (-2\vec{v})$



2. Compute the length of the vector $\vec{u} - 2\vec{v}$ from Question 1.

$$\vec{u} - 2\vec{v} = (3, 1)$$

$$|\vec{u} - 2\vec{v}| = \sqrt{3^2 + 1^2} = \sqrt{10}$$