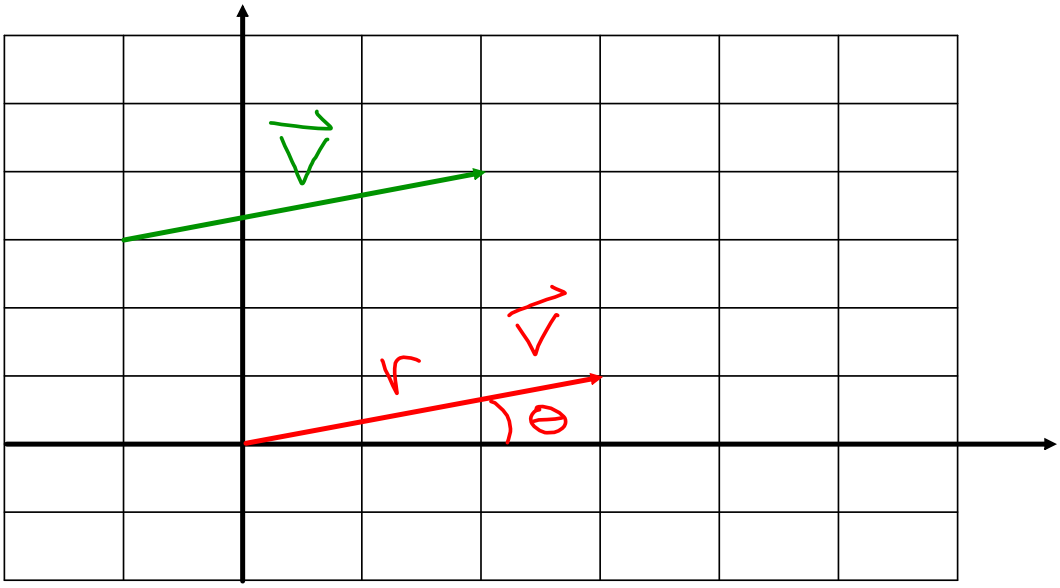

$\vec{V} = (x, y) = (3, 1)$

or, $r = \sqrt{3^2 + 1^2} = \sqrt{10}$ (magnitude)

$\theta = \text{atan}\left(\frac{1}{3}\right) = 18.43^\circ$ (direction)

vector: magnitude & direction ~~& location~~

Therefore, $\vec{V} = \vec{V}$

3.3 - Properties of vectors

- If $\vec{v} = (x, y)$ then $a\vec{v} = (ax, ay)$
- If $\vec{v}_1 = (x_1, y_1)$ and $\vec{v}_2 = (x_2, y_2)$ then $\vec{v}_1 + \vec{v}_2 = (x_1 + x_2, y_1 + y_2)$

$$\Rightarrow a(\vec{v}_1 + \vec{v}_2) = a\vec{v}_1 + a\vec{v}_2$$

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

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

$$\vec{v}_1 + \vec{v}_2 = \vec{v}_2 + \vec{v}_1$$

$$(\vec{v}_1 + \vec{v}_2) + \vec{v}_3 = \vec{v}_1 + (\vec{v}_2 + \vec{v}_3)$$

* Do what comes naturally

(exceptions: $\vec{v}_1 \times \vec{v}_2 = -\vec{v}_2 \times \vec{v}_1$)

(Also not covered: $\vec{v}_1 \cdot \vec{v}_2 = \text{scalar}$)

Graphically:

see github.com/naharrison/graphical-vector-adder

↳ releases...