

Diferença de Pontos

$$\overrightarrow{AB} = B - A = (b_1 - a_1, b_2 - a_2)$$

ex: $A(3, 2)$ e $B(4, 5)$

$$\overrightarrow{AB} = (4, 5) - (3, 2) = (4 - 3, 5 - 2) = (1, 3)$$

Norma

$$\|\overrightarrow{u}\| = \sqrt{(u_1)^2 + (u_2)^2}$$

ex: $\overrightarrow{u}(3, 2)$

$$\|\overrightarrow{u}\| = \sqrt{3^2 + 2^2} \Leftrightarrow \|\overrightarrow{u}\| = \sqrt{13}$$

Quadrado escalar

$$\left(\overrightarrow{u}\right)^2 = \|\overrightarrow{u}\|^2$$

ex: $\overrightarrow{u}(4, 3)$ e $\|\overrightarrow{u}\| = 5$ logo $\left(\overrightarrow{u}\right)^2 = 5^2$

$$A + \overrightarrow{u} = (a_1 + u_1, a_2 + u_2)$$

ex: $A(4, 5)$ e $\overrightarrow{u}(3, 2)$

$$A + \overrightarrow{u} = (4 + 3, 5 + 2) \Leftrightarrow A + \overrightarrow{u} = (7, 7)$$

$$\overrightarrow{u} + \overrightarrow{v} = (u_1 + v_1, u_2 + v_2)$$

ex: $\overrightarrow{u}(6, 3)$ e $\overrightarrow{v}(2, 1)$

$$\overrightarrow{u} + \overrightarrow{v} = (6 + 2, 3 + 1) \Leftrightarrow \overrightarrow{u} + \overrightarrow{v} = (8, 4)$$

Operações Aritméticas

$$k \times \overrightarrow{u} = (k \times u_1, k \times u_2)$$

ex: $k = 2$ e $\overrightarrow{u}(3, 4)$

$$k \times \overrightarrow{u} = (2 \times 3, 2 \times 4) \Leftrightarrow k \times \overrightarrow{u} = (6, 8)$$

Produto Escalar ou Produto Interno

$$\overrightarrow{u} \cdot \overrightarrow{v} = u_1 \times v_1 + u_2 \times v_2$$

ex: $\overrightarrow{u}(2, 1)$ e $\overrightarrow{v}(0, 3)$

$$\overrightarrow{u} \cdot \overrightarrow{v} = 2 \times 0 + 1 \times 3$$

$$\overrightarrow{u} \cdot \overrightarrow{v} = 3$$

$$\overrightarrow{u} \cdot \overrightarrow{v} = \|\overrightarrow{u}\| \times \|\overrightarrow{v}\| \times \cos(\overrightarrow{u} \wedge \overrightarrow{v})$$

Ângulo de duas retas

vetores diretores das retas: \overrightarrow{u} e \overrightarrow{v}

ângulo formado: α

$$\cos \alpha = \frac{|\overrightarrow{u} \cdot \overrightarrow{v}|}{\|\overrightarrow{u}\| \times \|\overrightarrow{v}\|}$$