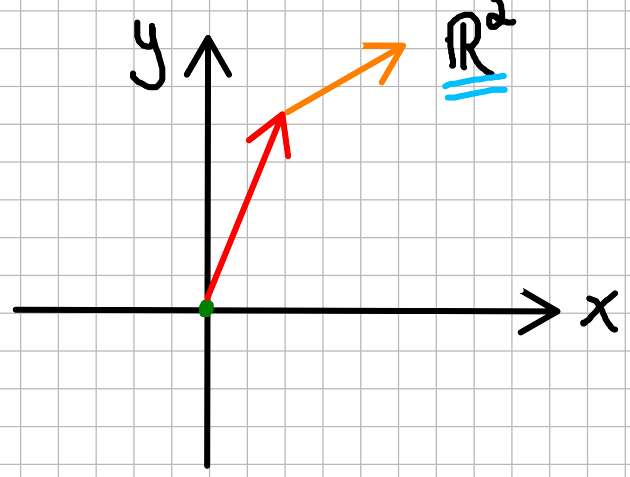
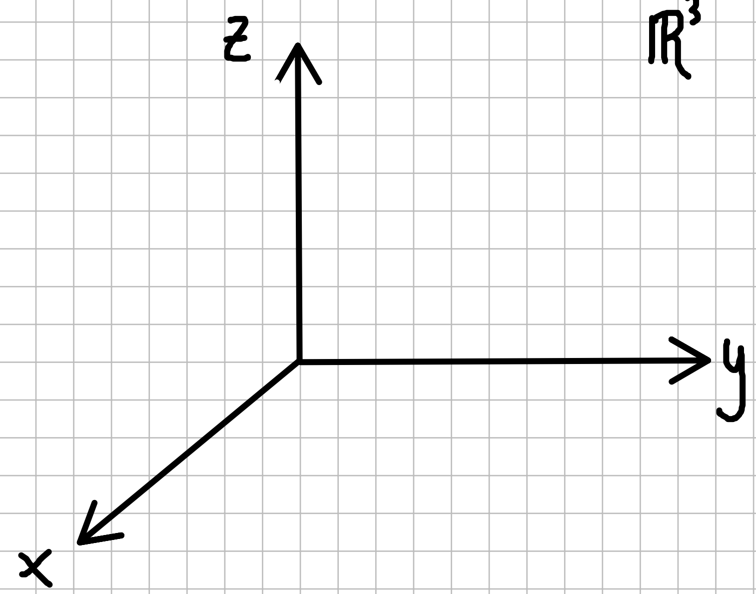
Aula 18/03/2021 - Computação





Ex 5) $v = (1, 2)$, $w = (-2, 1)$

$v + 2w = (1, 2) + 2(-2, 1)$

$= (1, 2) + (-4, 2)$

$= (-3, 4)$

$\therefore\ v + 2w = (-3, 4)$

$v_1 = (3, 4)$
$v_2 = (1, 2, 0)$

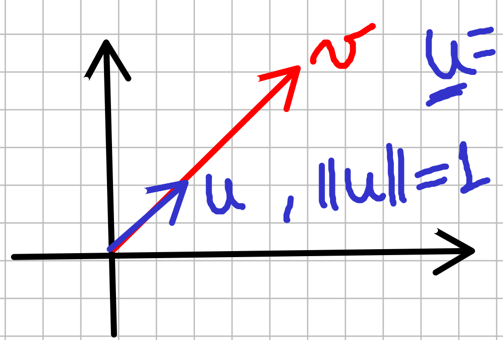
Logo, 1ª componente de $v + 2w$ é -3

Ex 6) 2ª componente de $v + 2w$ é 4

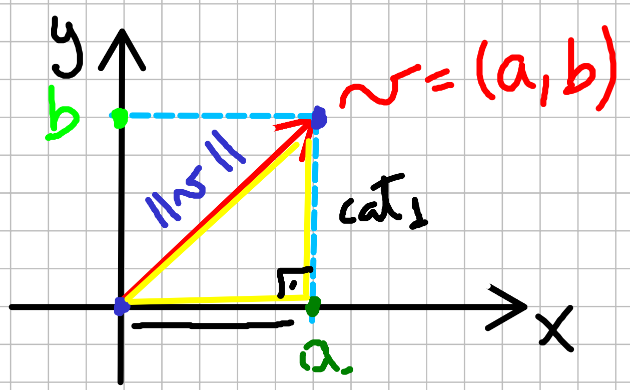
Ex 7) $\|v + 2w\| = \|(-3, 4)\|$

$= \sqrt{(-3)^2 + 4^2} = \sqrt{9 + 16} = \sqrt{25} = 5$

$\therefore\ \|v + 2w\| = 5$



$u = \dfrac{1}{\|v\|} v$



$$hip^2 = cat_1^2 + cat_2^2$$

$$\sqrt{\|v\|^{\cancel{2}}} = \sqrt{b^2 + a^2}$$

$$\|v\| = \sqrt{a^2+b^2}$$

$$\mathbb{R}^3 \Rightarrow v=(a,b,c) \Longrightarrow \|v\| = \sqrt{a^2+b^2+c^2}$$

Ex 8) $v=(1,2)$, $w=(-2,1)$

u é combinação linear de v e w ?

$$\Rightarrow u \overset{?}{=} c_1 v + c_2 w \quad , \exists\, c_1, c_2 \in \mathbb{R} \;?$$

$$(-6,1) = c_1(1,2) + c_2(-2,1)$$

$$(-6,1) = (c_1, 2c_1) + (-2c_2, c_2)$$

$$(-6,1) = (c_1 - 2c_2,\ 2c_1 + c_2)$$

$$\Rightarrow \begin{matrix} -2 \\ + \end{matrix}\begin{cases} c_1 - 2c_2 = -6 \\ 2c_1 + c_2 = 1 \end{cases} \sim \begin{cases} c_1 - 2c_2 = -6 \quad (I) \\ 0 + 5c_2 = 13 \Rightarrow c_2 = \frac{13}{5} \end{cases}$$

(I) $c_1 - 2\cdot\frac{13}{5} = -6 \Longleftrightarrow c_1 = \overset{-\frac{30}{5}}{-6} + \frac{26}{5} = -\frac{4}{5}$

$\therefore\ c_1 = -\frac{4}{5}$ e $c_2 = \frac{13}{5}$

Logo, $\exists\, c_1 = -\frac{4}{5},\ c_2 = \frac{13}{5}$ / $u = -\frac{4}{5} v + \frac{13}{5} w$

$c_1 = -1 \quad e \quad c_2 = 2$

$$c_1 v + c_2 w = -1(1,2) + 2(-2,1)$$
$$= (-1,-2) + (-4,2)$$
$$= (-5,0) \neq (-6,1)$$

Obs: $c_1 = -\frac{4}{5}$, $c_2 = \frac{13}{5}$

$$c_1 v + c_2 w = -\frac{4}{5}(1,2) + \frac{13}{5}(-2,1)$$
$$= \left(-\frac{4}{5}, -\frac{8}{5}\right) + \left(-\frac{26}{5}, \frac{13}{5}\right)$$
$$= \left(-\frac{30}{5}, \frac{5}{5}\right) = (-6,1) = u$$

$\mathbb{R}^2 \Rightarrow \{\vec{i}, \vec{j}\}$, $\vec{i} = (1,0)$

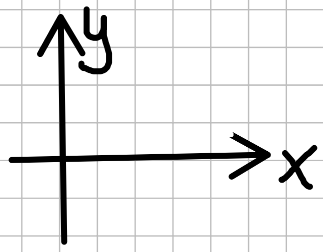
$\vec{j} = (0,1)$

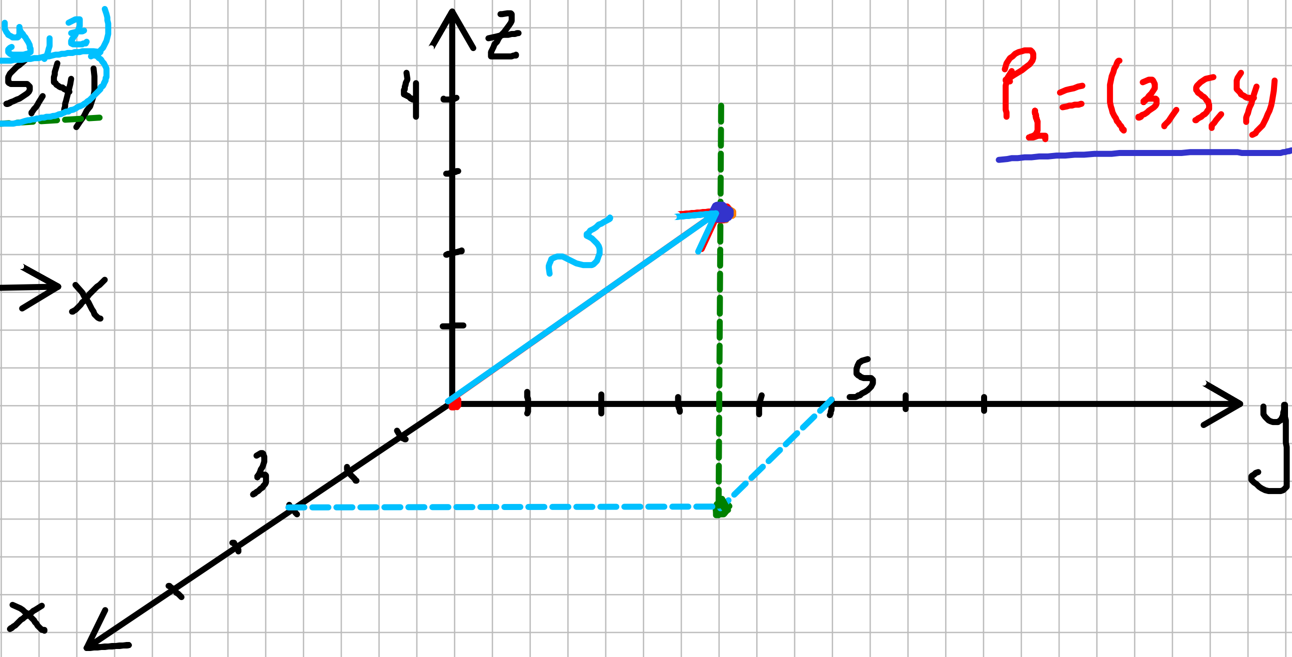
$$v = (\underline{x}, \underline{y}) = \underline{x}(1,0) + \underline{y}(0,1) = x\vec{i} + y\vec{j}$$

$$(2,3) = 2(1,0) + 3(0,1)$$

(x, y, z)

$v = (3, 5, 4)$





$P_1 = (3, 5, 4)$

$v = (x, y) \qquad v = \begin{pmatrix} x & y \end{pmatrix} \qquad v = \begin{pmatrix} x \\ y \end{pmatrix}$

$-v = (-1)v$

$v - w = v + (-w)$