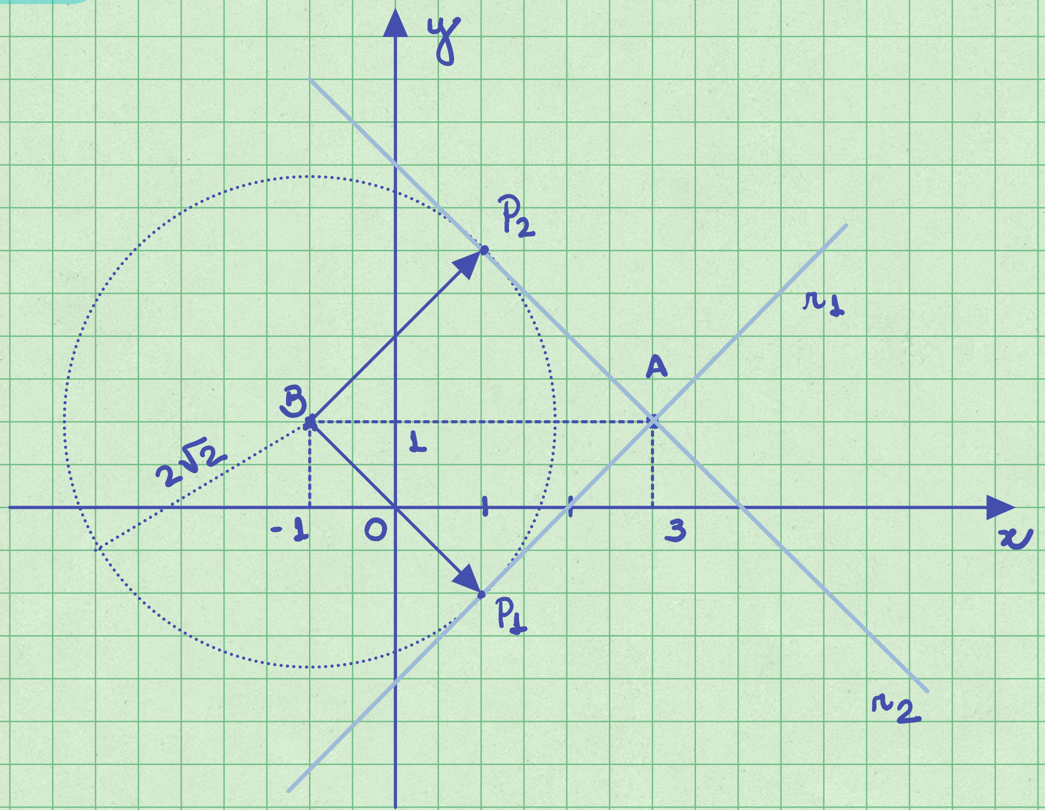
Lista 1 - Ex. 26



$P_1(x, y_1)$

$P_2(x, y_2)$

$\vec{BP_1} \cdot \vec{AP_1} = 0$ $\qquad |\vec{BP_1}| = |\vec{BP_2}| = 2\sqrt{2}$

$\vec{BP_2} \cdot \vec{AP_2} = 0$

⋮

P_1, P_2

↓

Eqs. vetorial, Paramétricas, Simétricas, Reduzida

Lista 2 - Ex. 1

$\measuredangle_{\vec{u},\vec{v}} = \dfrac{\pi}{6} = \theta$ $\qquad |\vec{u} \times \vec{v}| = ?$ (i)

$|4\vec{u} \times 9\vec{v}| = ?$ (ii)

$|\vec{u}| = 1$

$|\vec{v}| = 7$

P. VIII $\quad$ i) $|\vec{u} \times \vec{v}| = |\vec{u}|\,|\vec{v}| \operatorname{sen}\theta$

$= 1 \cdot 7 \cdot \operatorname{sen} \pi/6 = 7 \cdot 1/2 = 7/2$

ii) $\vec{w} = 4\vec{u} \times 9\vec{v}$

$$\vec{w} = 4 \cdot 9\,(\vec{u} \times \vec{v}) = 36\,(\vec{u} \times \vec{v})$$

$$|\vec{w}| = |36(\vec{u} \times \vec{v})| = |36|\,|\vec{u} \times \vec{v}| = 36 \cdot \frac{7}{2} = 126$$

Lista 2 - Ex. 7(b)

$$\vec{x} \times (\vec{i} + \vec{j}) = \vec{i} + \vec{j} + \vec{k} \qquad \vec{x} = ?$$

$\vec{i} = (1,0,0)$
$\vec{j} = (0,1,0)$
$\vec{k} = (0,0,1)$
$\vec{x} = (a,b,c)$

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

$$\vec{x} \times (\vec{i} + \vec{j}) = \begin{vmatrix} \vec{i} & \vec{j} & \vec{k} \\ a & b & c \\ 1 & 1 & 0 \end{vmatrix} = -c\,\vec{i} + c\,\vec{j} + (a-b)\,\vec{k}$$
$$= (-c, c, a-b)$$

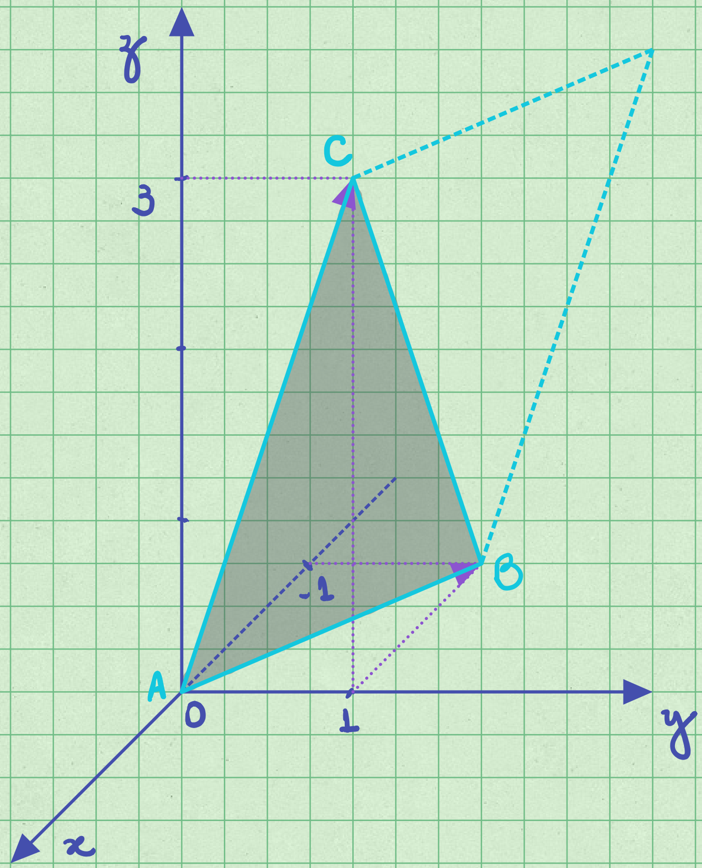
Portanto:

$$(-c, c, a-b) = \boxed{(1,1,1)}^{\,\vec{i}+\vec{j}+\vec{k}}$$

$$\begin{cases} \boxed{\begin{matrix} -c = 1 \\ c = 1 \end{matrix}} \\ a - b = 1 \end{cases} \longrightarrow c = 1 \text{ e } c = -1 \quad \therefore \nexists \text{ solução}$$

$\nexists\ \vec{x} \in \mathbb{R}^3$ que satisfaça a equação

Lista 2 - Ex. 6



$\vec{u} = \vec{AB} = (-1, 1, 0)$

$\vec{v} = \vec{AC} = (0, 1, 3)$

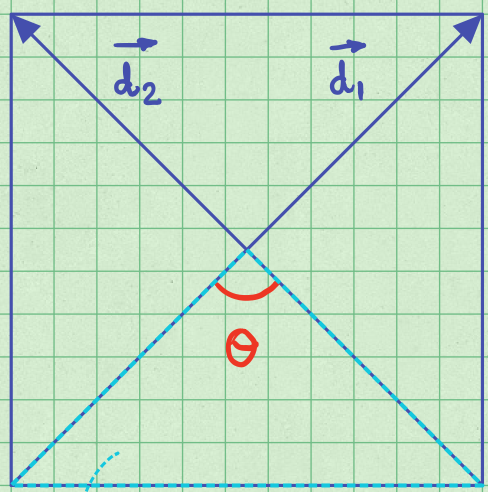
$$\text{Área}_{ABC} = \frac{1}{2} \, |\vec{u} \times \vec{v}|$$

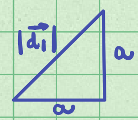
$$\vec{u} \times \vec{v} = \begin{vmatrix} \vec{i} & \vec{j} & \vec{k} \\ -1 & 1 & 0 \\ 0 & 1 & 3 \end{vmatrix} = 3\vec{i} + 3\vec{j} - \vec{k} = (3, 3, -1)$$

$$|\vec{u} \times \vec{v}| = \sqrt{(3,3,-1) \cdot (3,3,-1)} = \sqrt{9 + 9 + 1} = \sqrt{19}$$

$$\therefore \ \text{Área}_{ABC} = \frac{\sqrt{19}}{2}$$

Lista 1 - Ex. 22



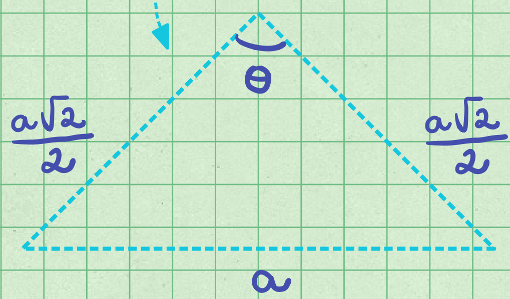


Diagonais do quadrado têm mesmo tamanho!

$$\boxed{|\vec{d_1}| = |\vec{d_2}| = a\sqrt{2}}$$

a... lado do quadrado

$\theta = ?$



Aplicando a Lei dos Cossenos :

$$a^2 = \left(\frac{a\sqrt{2}}{2}\right)^2 + \left(\frac{a\sqrt{2}}{2}\right)^2 - 2\left(\frac{a\sqrt{2}}{2}\right)\left(\frac{a\sqrt{2}}{2}\right)\cos\theta$$

$$a^2 = \frac{1}{2}a^2 + \frac{1}{2}a^2 - a^2\cos\theta$$

$$-a^2\cos\theta = 0$$

$$\cos\theta = \frac{0}{a^2} \quad , \quad a \neq 0 \text{ (lado do quadrado)}$$

$$\cos\theta = 0$$

$$\therefore \theta = \pi/2$$