Pontos e vetores em R3

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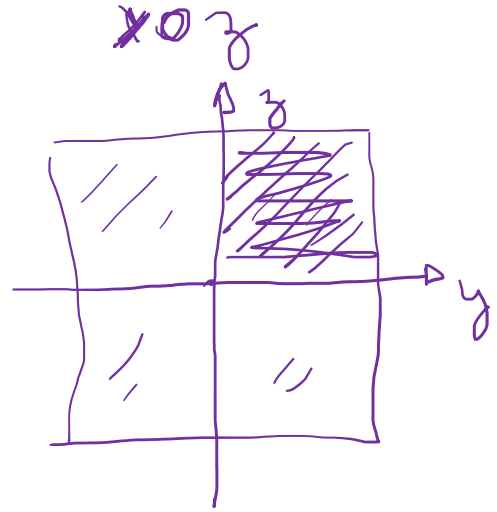
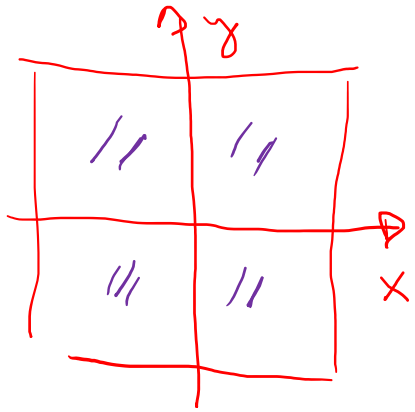
FURB

Localização de ptos em $\mathbb{R}^3$

$A(1, 2, 3)$
$x\ y\ z$

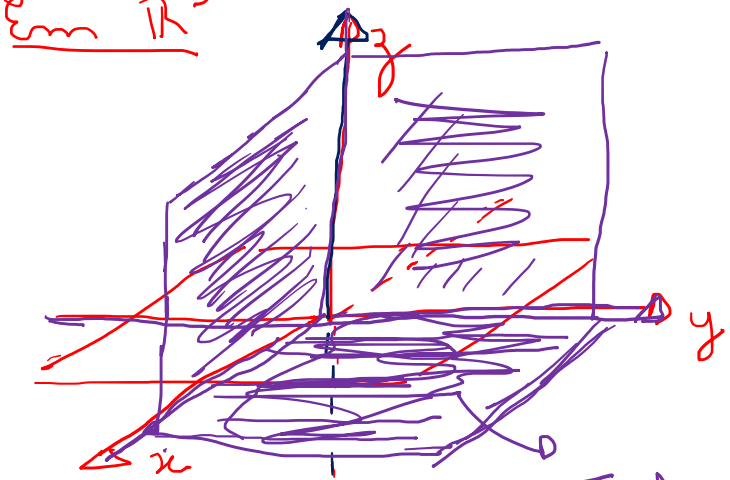


Em $\mathbb{R}^2$



4 quadrantes

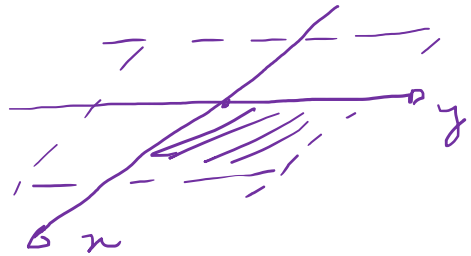
Em $\mathbb{R}^3$



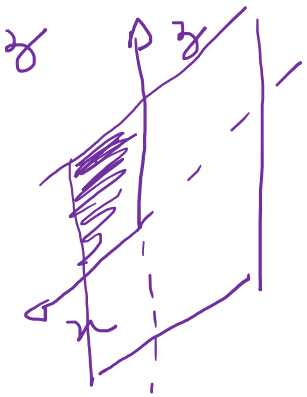
1º octante

8 octantes

xOy



xOz

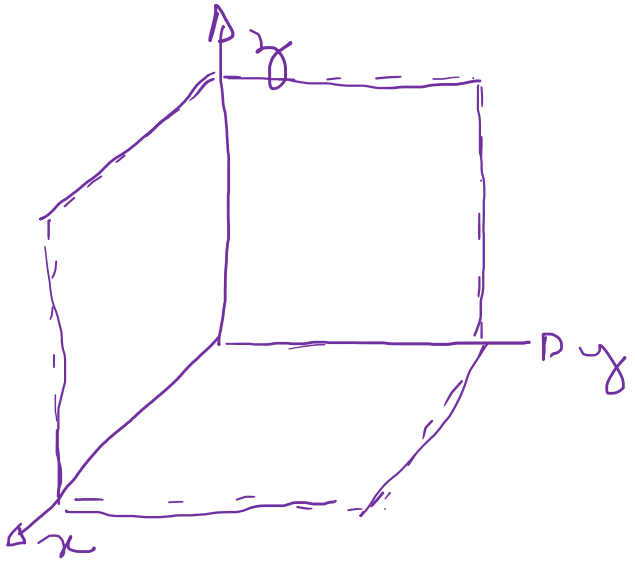


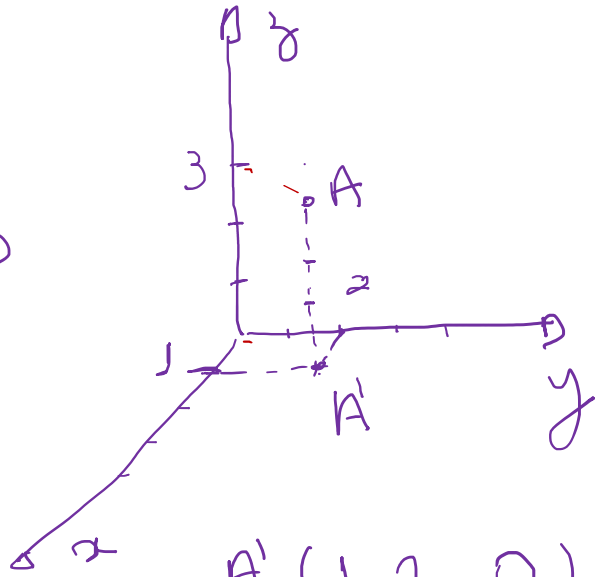
coordenadas.

$A(1,2,3)$

x y z

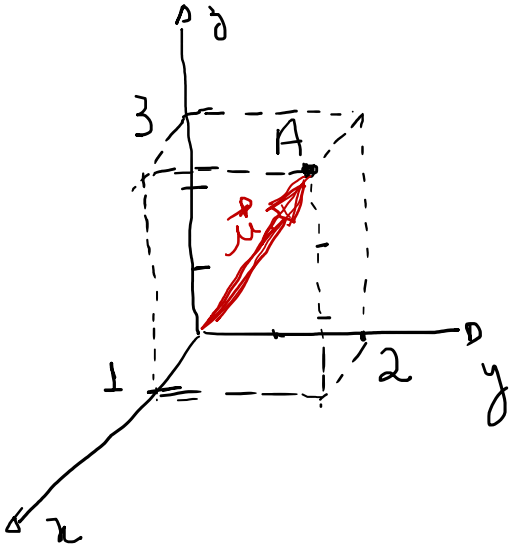
Localizar no espaço $\mathbb{R}^3$





$A'(1,2,0)$

x y z



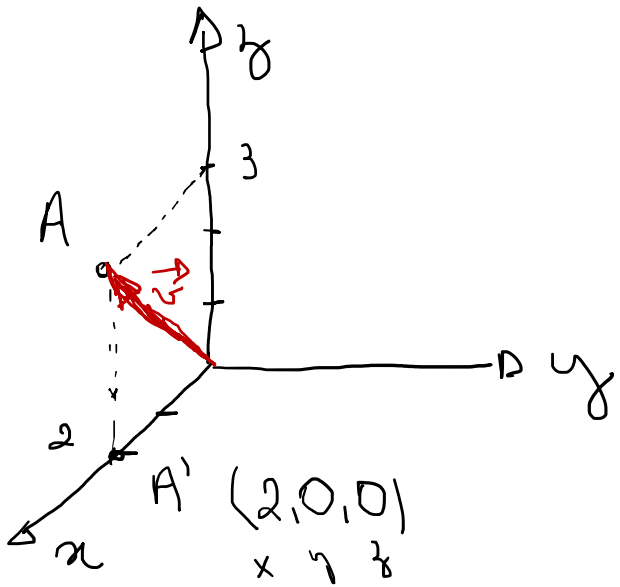
vetores $\vec{u} = (1,2,3)$

a b c

componentes

a) localizar o pto $A(2,0,3)$ (x, y, z)

e o vetor $\vec{v} = (2,0,3)$

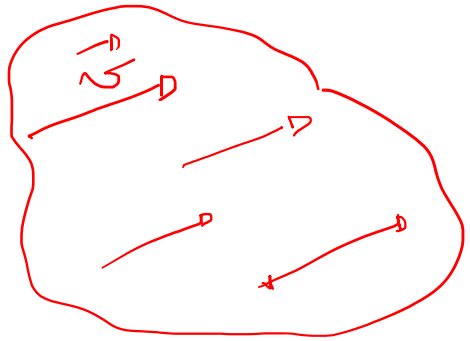


notação de vetores:

$\vec{v} = (a, b, c) = (x, y, z)$

$\vec{v} = x\vec{i} + y\vec{j} + z\vec{k}$ ou $v(x, y, z)$

$\vec{v} = \overrightarrow{AB} = B - A$



Em $\mathbb{R}^2$

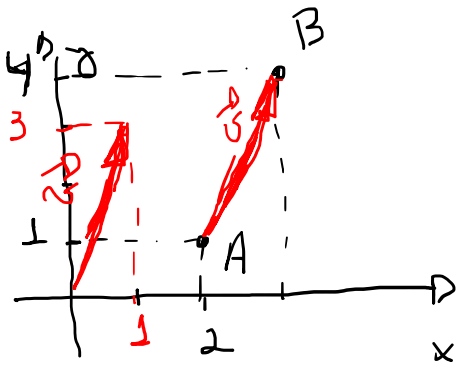
$\vec{v} = (a, b)$

$\vec{v} = x\vec{i} + y\vec{j}$

$\vec{v} = \overrightarrow{AB} = B - A$

Ex: $\vec{v} = \overrightarrow{AB} = B - A = (3,4) - (2,1) = (1,3) \Rightarrow \vec{v} = \overrightarrow{AB} = (1,3)$

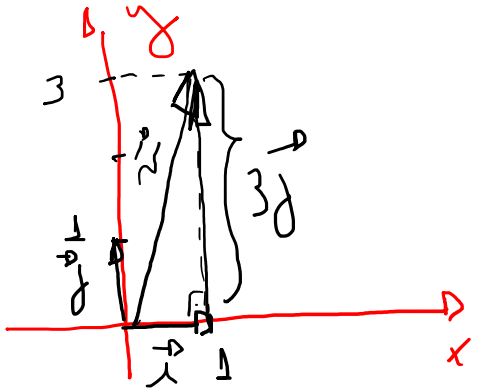
Sendo
A (2,1)
B (3,4)



$\vec{v} = (1,3) = 1\vec{i} + 3\vec{j} = \vec{i} + 3\vec{j}$

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

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

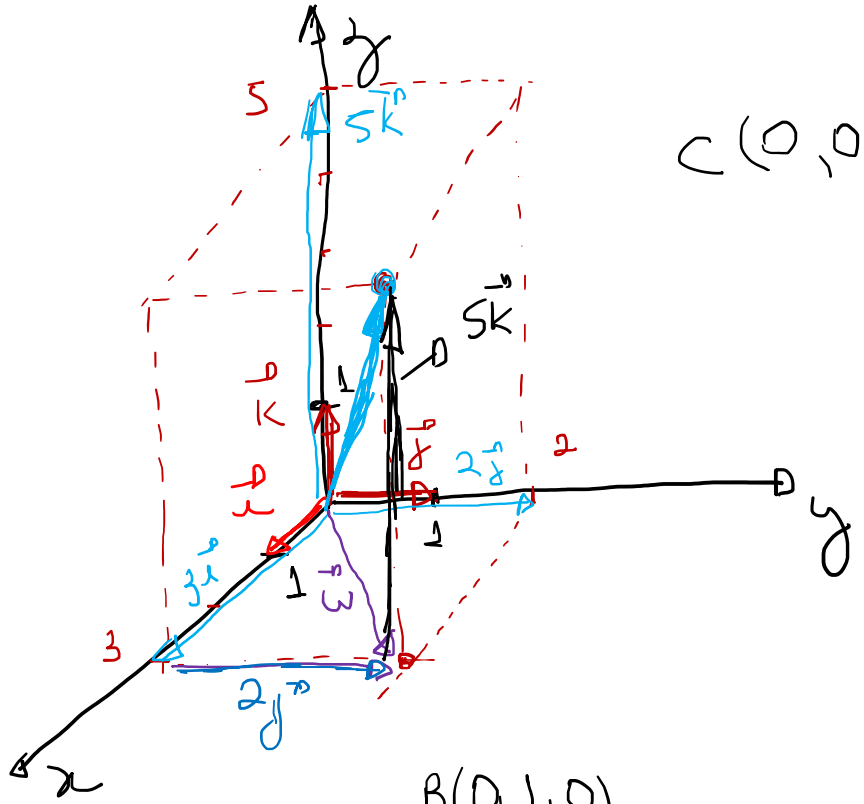


no $\mathbb{R}^3$

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

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

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



$C(0,0,1)$

$D(3,2,5)$

$\vec{v} = (3,2,5)$

$\vec{v} = 3\vec{i} + 2\vec{j} + 5\vec{k}$

ou

$\vec{v} = (3,2,5)$

$B(0,1,0)$

$A(1,0,0)$

$\vec{\omega} = 3\vec{i} + 2\vec{j}$

$\vec{v} = \vec{\omega} + 5\vec{k}$

$\vec{v} = 3\vec{i} + 2\vec{j} + 5\vec{k} = (3,2,5)$

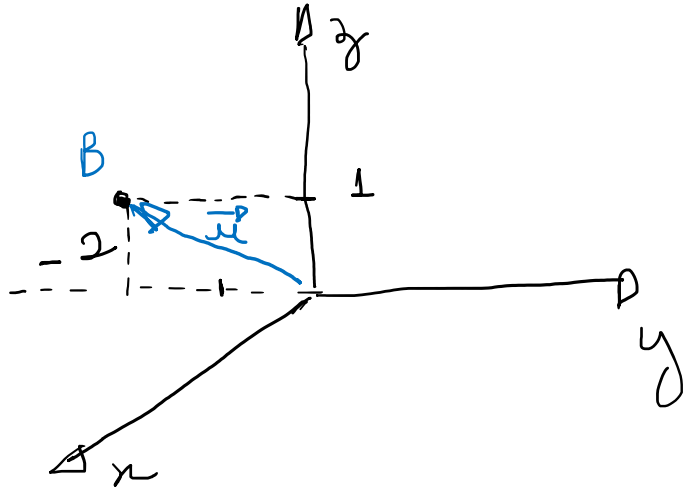
extremidade do vetor que parte sempre da origem

Faça a representação gráfica dos vetores em $\mathbb{R}^3$:

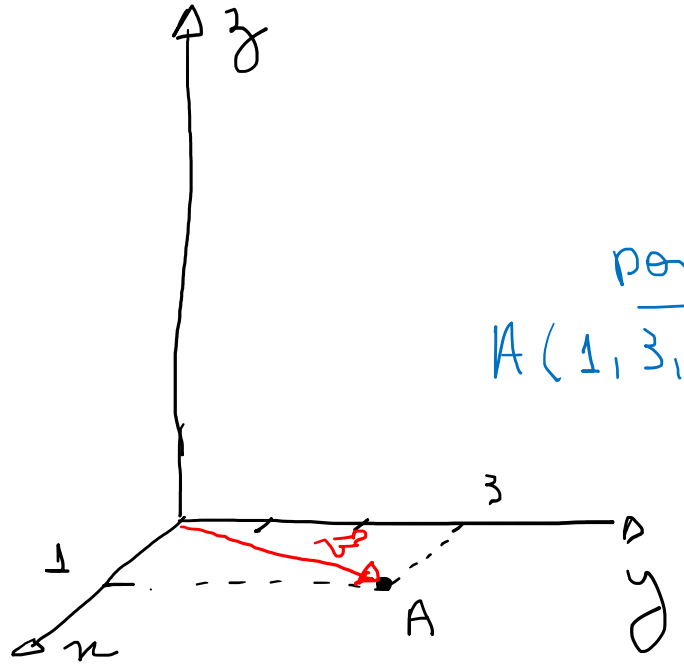
a) $\vec{v} = \vec{i} + 3\vec{j} = (1, 3, 0)$ extremidade do vetor

b) $\vec{u} = -2\vec{j} + \vec{k} = (0, -2, 1)$

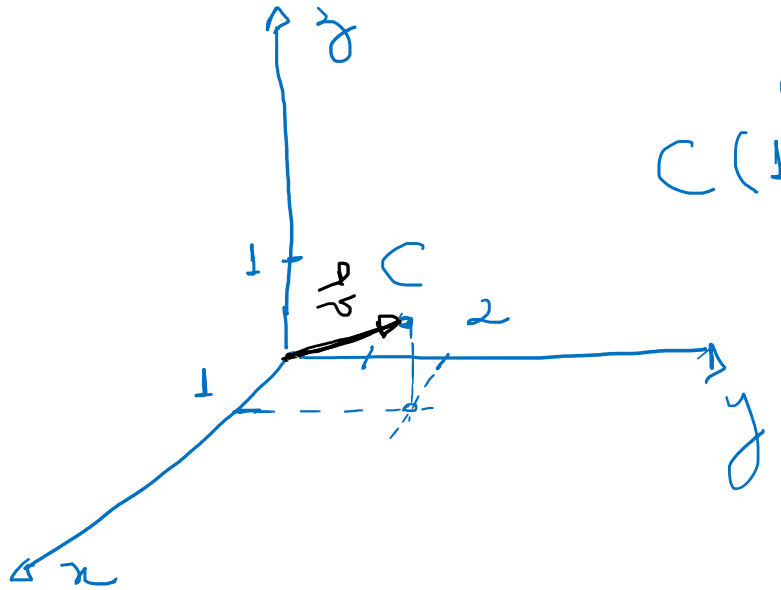
c) $\vec{w} = \vec{i} + 2\vec{j} + 1k = (1, 2, 1)$



B(0, -2, 1)



ponto A(1, 3, 0)



pto. C(1, 2, 1)