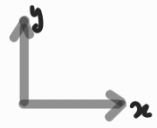
GEOMETRIA ANALITICA

No PLANO



Distância entre 2 pontos

$A(x_A, y_A)$
$B(x_B, y_B)$

$$d_{AB} = \sqrt{(x_A - x_B)^2 + (y_A - y_B)^2}$$

Ponto médio de [AB]

$$M\left(\frac{x_A + x_B}{2}, \frac{y_A + y_B}{2}\right)$$

Mediatriz de [AB]

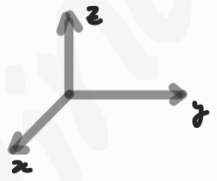
$$(x - x_A)^2 + (y - y_A)^2 = (x - x_B)^2 + (y - y_B)^2$$

Equação reduzida da circunferência

$$(x - x_c)^2 + (y - y_c)^2 = r^2$$

(x_c, y_c) - coordenadas do centro
R - raio

No ESPAÇO



$A(x_A, y_A, z_A)$
$B(x_B, y_B, z_B)$

$$d_{AB} = \sqrt{(x_A - x_B)^2 + (y_A - y_B)^2 + (z_A - z_B)^2}$$

$$M\left(\frac{x_A + x_B}{2}, \frac{y_A - y_B}{2}, \frac{z_A - z_B}{2}\right)$$

Plano Mediador

$$(x - x_A)^2 + (y - y_A)^2 + (z - z_A)^2 = (x - x_B)^2 + (y - y_B)^2 + (z - z_B)^2$$

Eq. reduzida da super. Esférica

$$(x - x_c)^2 + (y - y_c)^2 + (z - z_c)^2 = r^2$$

$$(a+b)^2 = a^2 + 2ab + b^2$$

$$(a-b)^2 = a^2 - 2ab + b^2$$

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EQs da Reta

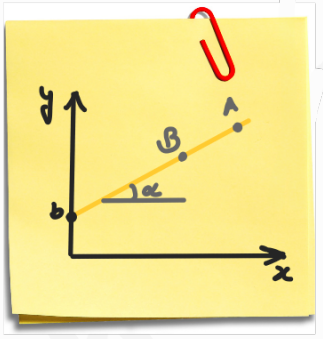
Equação reduzida

$y = mx + b$

- m: declive
- b: ordenada na origem

$$m = \frac{y_A - y_B}{x_A - x_B}$$

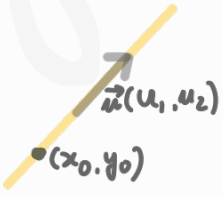
$$m = Tg\,\alpha$$



Equação vetorial

2D $(x, y) = \underbrace{(x_0, y_0)}_{\text{ponto conhecido}} + K\underbrace{(u_1, u_2)}_{\text{vetor diretor}}, \quad K \in \mathbb{R}$

3D $(x, y, z) = (x_0, y_0, z_0) + K(u_1, u_2, u_3), \quad K \in \mathbb{R}$



Equações paramétricas

2D
$$\begin{cases} x = x_0 + K u_1 \\ y = y_0 + K u_2 \end{cases}, \quad K \in \mathbb{R}$$

3D
$$\begin{cases} x = x_0 + K u_1 \\ y = y_0 + K u_2 \\ z = z_0 + K u_3 \end{cases}, \quad K \in \mathbb{R}$$

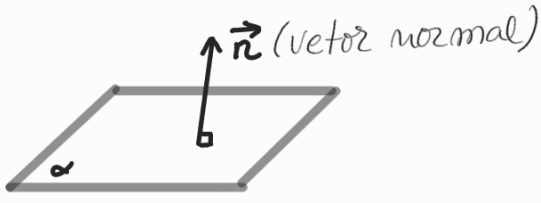
Equação Cartesiana

2D $ax + by + c = 0$

EQ. do Plano

3D $Ax + By + Cz + D = 0$

$\vec{n}\,(A, B, C)$



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Vetores

$\overrightarrow{AB} = B - A$

vetor + ponto = vetor

vetor + vetor = vetor

$A(1,-2,3)$ $B(4,5,0)$

$\overrightarrow{AB} = (4,5,0) - (1,-2,3)$
$= (4-1, 5-(-2), 0-3)$
$= (3, 7, -3)$

Produto escalar

pode ser determinado de duas formas

Pela fórmula!

$$\vec{u} \cdot \vec{v} = \|\vec{u}\| \times \|\vec{v}\| \times \cos(\vec{u}\hat{}\vec{v})$$

Conhecendo $\vec{u}$ e $\vec{v}$

$\vec{u}(2,0,3)$
$\vec{v}(-1,2,-3)$
$\vec{u} \cdot \vec{v} = (2,0,3) \cdot (-1,2,-3)$
$= 2 \times -1 + 0 \times 2 + 3 \times -3$
$= -2 - 9 = -7$

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