

## VETORES NO ESPAÇO

BARICENTRO DO  $\triangle ABC$ 

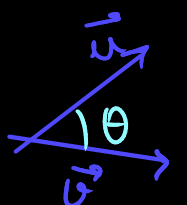
$$\bullet G = \frac{A+B+C}{3}$$

## PRODUTO ESCALAR

$$\vec{u} = (x, y, z) \quad \vec{v} = (x', y', z')$$

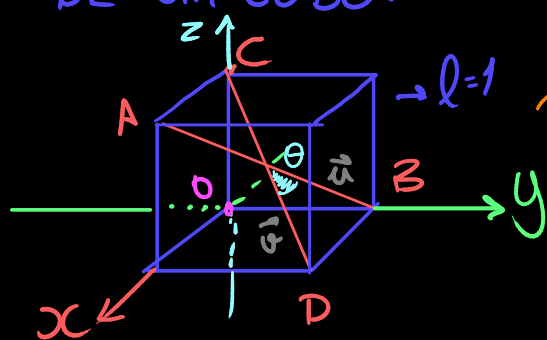
$$\vec{u} \cdot \vec{v} = x \cdot x' + y \cdot y' + z \cdot z'$$

## ÂNGULO



$$\cos \theta = \frac{\vec{u} \cdot \vec{v}}{|\vec{u}| \cdot |\vec{v}|}$$

Ex: DETERMINAR O ÂNGULO FORMADO POR 2 DIAGONAIS DE UM CUBO.



$$A = (1, 0, 1)$$

$$B = (0, 1, 0)$$

$$C = (0, 0, 1)$$

$$D = (1, 1, 0)$$

$$B - A$$

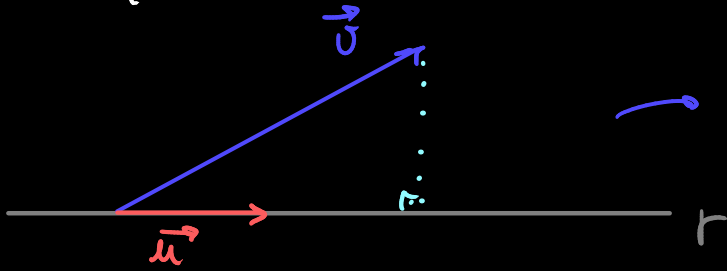
$$\vec{u} = (-1, 1, -1)$$

$$D - C$$

$$\vec{v} = (1, 1, -1)$$

$$\cos \theta = \frac{1}{\sqrt{3} \cdot \sqrt{3}} = \left[ \frac{1}{3} \right], \quad \theta \approx 70,5^\circ$$

## PROJEÇÃO DE UM VETOR SOBRE A RETA



$$\vec{v} = \frac{\vec{u} \cdot \vec{v}}{\vec{u} \cdot \vec{u}} \cdot \vec{u}$$

## EQUAÇÃO DA RETA

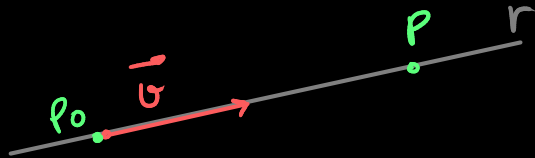
$$P_0 = (x_0, y_0, z_0)$$

$$v = (a, b, c) = \text{vetor diretor}$$

$$P = (x, y, z) \in r$$

$$\vec{P_0P} = t \cdot v, t \in \mathbb{R}$$

$$P = P_0 + t \cdot v$$



$$\begin{cases} x = x_0 + a \cdot t \\ y = y_0 + b \cdot t \\ z = z_0 + c \cdot t \end{cases}$$

EQUAÇÕES PARAMÉTRICAS

## POSICÕES RELATIVAS

→ DUAS RETAS PODEM SER:

\* PARALELAS

\* CONCORRENTES

\* REVERSAS