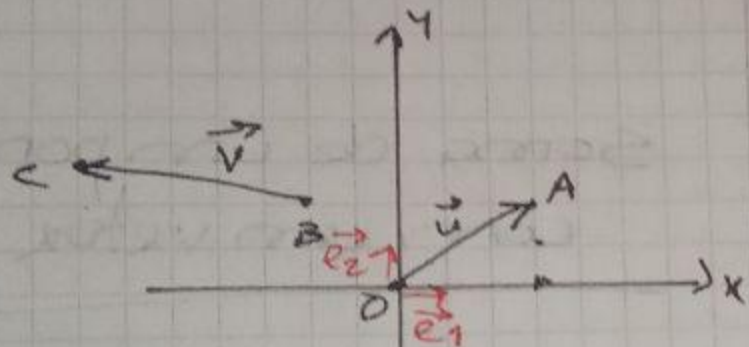
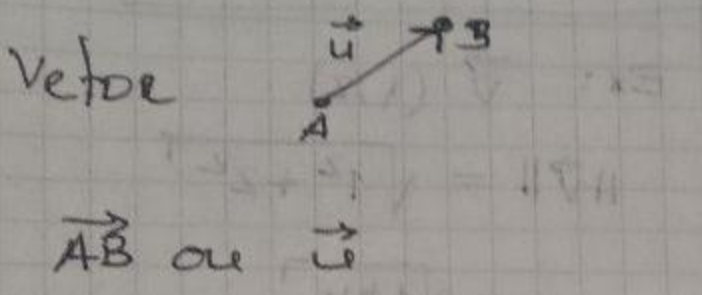


Coordenadas de um vetor



vetor \vec{OA} ou vetor $\vec{u}(3,2)$
 vetor \vec{BC} ou $\vec{v}(-5,1)$
 $\vec{u} = 3\vec{e}_1 + 2\vec{e}_2$ $\vec{v} = -5\vec{e}_1 + 1\vec{e}_2$

Operações

• Multiplicação por um escalar (nº real)

$\vec{a} = 3 \times \vec{u} = 3 \times (3,2) = (9,6)$

• Vetor simétrico

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

• Subtração de vetores

$\vec{u} - \vec{v}$
 $(3,2) - (-5,1)$
 $= (3 - (-5), 2 - 1)$
 $= (3 + 5, 1)$
 $= (8,1)$

Vetores colineares

(3,2) & (6,4) → Múltiplos
 (3,2) & (2,4) → Paralelos

$\vec{a} = (1,2)$ $\vec{c} = (3,4)$
 $\vec{b} = (2,4)$

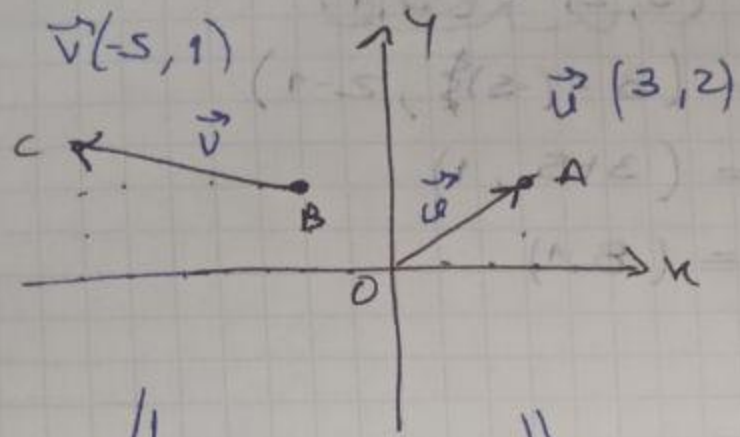
\vec{a} e \vec{b} são colineares?

$\frac{2}{1} = \frac{4}{2}$ Sim
 $2 = 2$

\vec{a} e \vec{c} são colineares?

$\frac{3}{1} = 3$ Não
 $\frac{4}{2} = 2$

Vetor como
Diferença de pontos

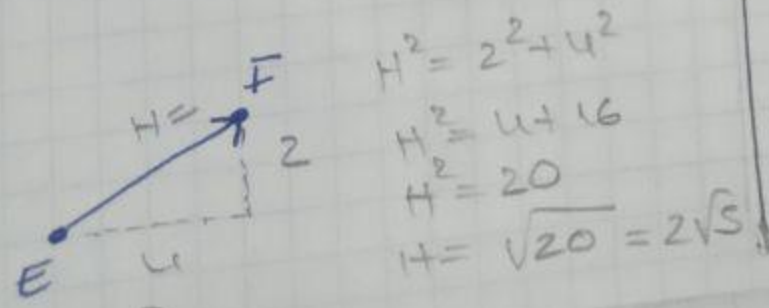
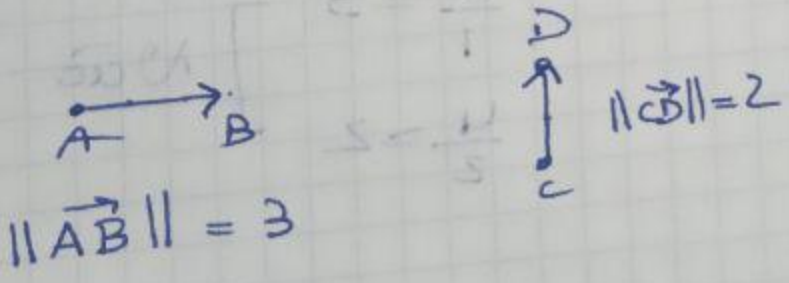


$$\vec{u} = \vec{OA} = A - O$$

$$\begin{aligned} \vec{v} = \vec{BC} &= C - B \\ &= (-7, 3) - (-2, 2) \\ &= (-7 - (-2), 3 - 2) \\ &= (-7 + 2, 1) \\ &= (-5, 1) \end{aligned}$$

Norma

↳ comprimento



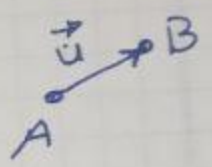
$$\vec{u} (u_1, u_2)$$

$$\|\vec{u}\| = \sqrt{u_1^2 + u_2^2}$$

Ex: $\vec{v} (1, 2)$

$$\begin{aligned} \|\vec{v}\| &= \sqrt{1^2 + 2^2} \\ &= \sqrt{1 + 4} \\ &= \sqrt{5} \end{aligned}$$

Soma de um ponto
com um vetor



$$A + \vec{u} = B$$

$$\begin{aligned} B + \vec{v} &= C \\ (-2, 2) + (-5, 1) &= (-7, 3) = C \end{aligned}$$