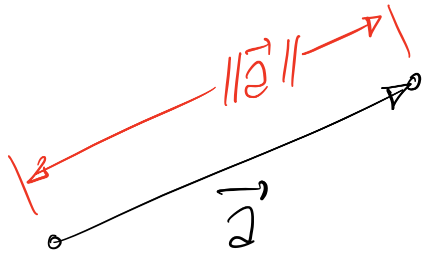
1.4.2

1.4.3

1.4.4



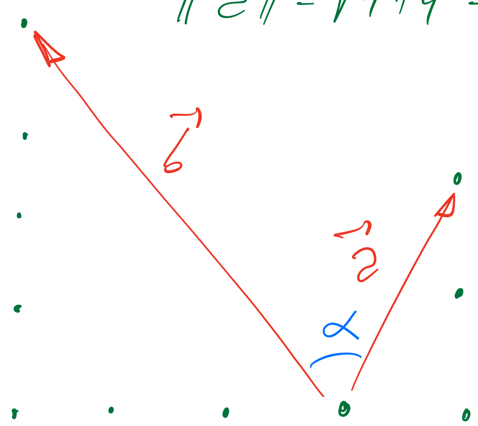
$$\|\vec{a}\| = \sqrt{a_1^{\,2} + a_2^{\,2}}$$

$$\vec{a} = \begin{pmatrix} a_1 \\ a_2 \end{pmatrix}$$

Exemple: $\vec{a} = \begin{pmatrix} 1 \\ 2 \end{pmatrix}$ $\quad \vec{b} = \begin{pmatrix} -3 \\ 4 \end{pmatrix}$

$\|\vec{a}\| = \sqrt{1+4} = \sqrt{5}$ $\quad \|\vec{b}\| = \sqrt{9+16} = 5$

Esquisse



But: calculer α

produit scalaire

$$\vec{a} \bullet \vec{b} = \begin{pmatrix} 1 \\ 2 \end{pmatrix} \bullet \begin{pmatrix} -3 \\ 4 \end{pmatrix} = 1 \cdot (-3) + 2 \cdot 4$$

$$= -3 + 8 = 5$$

$|-5| = 5$ \
$|2| = 2$ } valeur absolue

$$\cos\alpha = \frac{|\vec{a} \bullet \vec{b}|}{\|\vec{a}\| \cdot \|\vec{b}\|} = \frac{|5|}{\sqrt{5} \cdot 5} = \frac{5}{\sqrt{5} \cdot 5} = \frac{1}{\sqrt{5}}$$

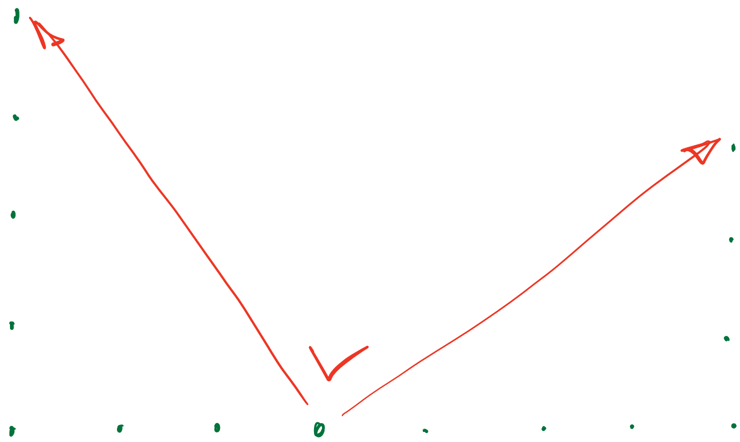
$$\alpha = \cos^{-1}\left(\frac{1}{\sqrt{5}}\right) \simeq 63{,}4^\circ$$

$$\vec{c} = \begin{pmatrix} 4 \\ 3 \end{pmatrix}$$

$$\vec{b} \cdot \vec{c} = \begin{pmatrix} -3 \\ 4 \end{pmatrix} \cdot \begin{pmatrix} 4 \\ 3 \end{pmatrix} = (-3)\cdot 4 + 4 \cdot 3$$

$$= -12 + 12$$

$$= 0$$



$$\vec{b} \cdot \vec{c} = 0 \Leftrightarrow \vec{b} \perp \vec{c}$$

Remarque: Si $\vec{x} = \begin{pmatrix} x_1 \\ x_2 \\ x_3 \end{pmatrix}$ et $\vec{y} = \begin{pmatrix} y_1 \\ y_2 \\ y_3 \end{pmatrix}$

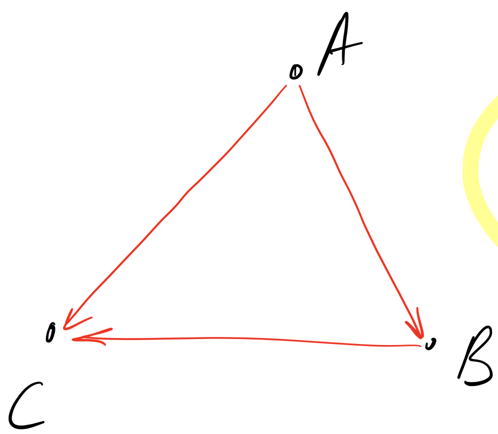
$$\vec{x} \cdot \vec{y} = x_1 y_1 + x_2 y_2 + x_3 y_3$$

et $\vec{x} \cdot \vec{y} = 0 \Leftrightarrow \vec{x} \perp \vec{y}$

→ 04/09/2025

$\left.\begin{array}{l} 1.4.1 \text{ à } 1.4.4 \\ 1.4.9 \\ 1.4.10 \end{array}\right\}$ À terminer

1.4.2



$$\underbrace{\|\vec{AB}\| + \|\vec{BC}\| + \|\vec{AC}\|}_{\text{périmètre}}$$

$$\vec{AB} = \langle\langle B - A \rangle\rangle = \begin{pmatrix} 4-2 \\ 3-1 \\ 4-3 \end{pmatrix} = \begin{pmatrix} 2 \\ 2 \\ 1 \end{pmatrix}$$

$\vec{AC} =$

$\vec{BC} =$

1.4.4

À vérifier

$\|\vec{AI}\| = \|\vec{BI}\|$

$= \|\vec{CI}\|$