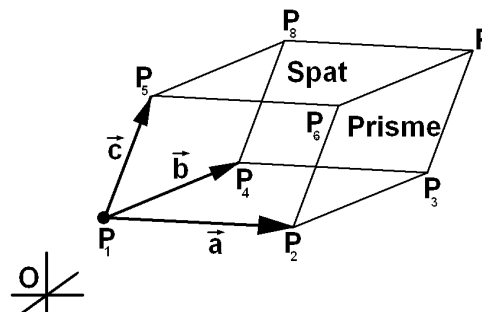


Übungen in AlgGeo ◇ Exercices en AlgGéo ◇ Type F1 ◇ I / 9

Probl. 1

$$\overrightarrow{0P_1} = \begin{pmatrix} 1 \\ 4 \\ 2 \end{pmatrix}$$

$$\vec{a} = \begin{pmatrix} 1 \\ 3 \\ 2 \end{pmatrix}, \quad \vec{b} = \begin{pmatrix} 1 \\ 1 \\ -2 \end{pmatrix}, \quad \vec{c} = \begin{pmatrix} 3 \\ 2 \\ -12 \end{pmatrix}$$



- (a) $\{\vec{a}, \vec{b}, \vec{c}\} \rightsquigarrow$ l.u.'l.i.?
- (b) $\vec{a}, \vec{b}, \vec{c}$ spiegeln an P_1 • *réfléter à P_1* $\rightsquigarrow \vec{a}', \vec{b}', \vec{c}' = ?$
- (c) $|\vec{a}| = ?$, $|\vec{b}| = ?$, $|\vec{c}| = ?$
- (d) $|\overrightarrow{P_1P_7}| = ?$, $|\overrightarrow{P_5P_3}| = ?$, $|\overrightarrow{P_2P_8}| = ?$, $|\overrightarrow{P_4P_6}| = ?$

Probl. 2 Aktuelle Basis: • *Base actuelle:* $\vec{e}_1 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$, $\vec{e}_2 = \begin{pmatrix} 0 \\ 1 \end{pmatrix} \rightsquigarrow B$

Neue Basis: • *Base nouvelle:* $\vec{b}_1 = \begin{pmatrix} 1 \\ 2 \end{pmatrix}$, $\vec{b}_2 = \begin{pmatrix} -1 \\ 2 \end{pmatrix} \rightsquigarrow B'$

In B : • *Dans B :* $\vec{v} = \vec{v}_B = \lambda_1 \vec{e}_1 + \lambda_2 \vec{e}_2 = \begin{pmatrix} \lambda_1 \\ \lambda_2 \end{pmatrix}_B \rightsquigarrow \vec{a}_B = \begin{pmatrix} 1 \\ 3 \end{pmatrix}_B$, $\vec{b}_B = \begin{pmatrix} -1 \\ 4 \end{pmatrix}_B$

In B' : • *Dans B :* $\vec{v} = \vec{v}_{B'} = \mu_1 \vec{b}_1 + \mu_2 \vec{b}_2 = \begin{pmatrix} \mu_1 \\ \mu_2 \end{pmatrix}_{B'} \rightsquigarrow \vec{a}_{B'} = \begin{pmatrix} ? \\ ? \end{pmatrix}_{B'}$, $\vec{b}_{B'} = \begin{pmatrix} ? \\ ? \end{pmatrix}_{B'}$

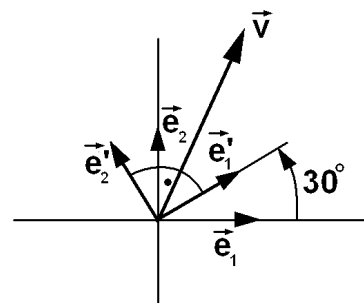
$$\rightsquigarrow \vec{a}_{B'} + \vec{b}_{B'} = \begin{pmatrix} ? \\ ? \end{pmatrix}_{B'}, \quad |\vec{a}_{B'} + \vec{b}_{B'}| = ?$$

Probl. 3

$$\vec{v} = \begin{pmatrix} \lambda_1 \\ \lambda_2 \end{pmatrix}_B = \begin{pmatrix} 1 \\ 2 \end{pmatrix}_B = \lambda_1 \vec{e}_1 + \lambda_2 \vec{e}_2$$

$$\vec{v}_{B'} = \mu_1 \vec{e}_1' + \mu_2 \vec{e}_2'$$

$$\rightsquigarrow \mu_1 \mu_2 = ?$$



WIR