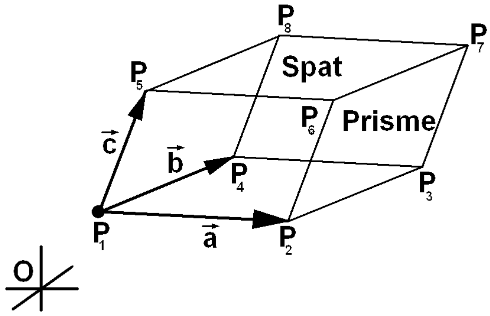
Übungen in AlgGeo ◇ Exercices en AlgGéo ◇ Type B1 ◇ I / 9

Probl. 1



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

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

(a) $\{\vec{a}, \vec{b}, \vec{c}\} \rightsquigarrow$ *l.u.'l.i.?*

(b) $\vec{a}, \vec{b}, \vec{c}$ spiegeln an P_1 • *refléter 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:* $\vec{e}_1 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}, \ \vec{e}_2 = \begin{pmatrix} 0 \\ 1 \end{pmatrix} \rightsquigarrow B$

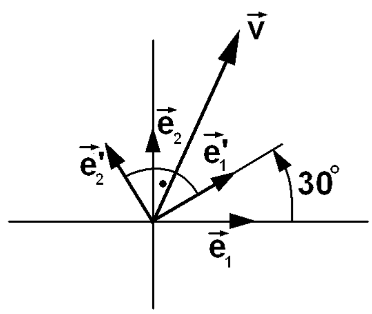
Neue Basis: • *Base nouvelle:* $\vec{b}_1 = \begin{pmatrix} 1 \\ 2 \end{pmatrix}, \ \vec{b}_2 = \begin{pmatrix} -1 \\ 2 \end{pmatrix} \rightsquigarrow B'$

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

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

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