Übungen in AlgGeo ◇ Exercices en AlgGéo ◇ T. B1 ◇ II / 15

Probl. 1 $\vec{x} \longmapsto B \cdot \vec{x} = \vec{y}$

$$B = \begin{pmatrix} 1 & 0 \\ 2 & 2 \end{pmatrix}, \ \vec{v} = 2\,\vec{a} - \vec{b}, \ \vec{a} = \begin{pmatrix} 1 \\ 2 \end{pmatrix}, \ \vec{b} = \begin{pmatrix} 2 \\ -3 \end{pmatrix}$$

(a) Berechne: • *Calculer:*

$B \cdot \vec{a}, \ B \cdot \vec{b}, \ B \cdot \vec{v}$

(b) Skizziere: • *Esquisse:*

$\vec{a}, \vec{b}, \vec{v}, B \cdot \vec{a}, B \cdot \vec{b}, B \cdot \vec{v}$

Probl. 2 $\vec{x} = \begin{pmatrix} x_1 \\ x_2 \end{pmatrix} \longmapsto \vec{y} = A \cdot \vec{x} = x_1 \cdot \begin{pmatrix} 8 \\ 7 \end{pmatrix} + x_2 \cdot \begin{pmatrix} 2 \\ 1 \end{pmatrix}$

(a) $A = ?$

(b) $\vec{x} = \begin{pmatrix} 5 \\ 9 \end{pmatrix} \longmapsto \vec{y} = ?$

Probl. 3 $R = \begin{pmatrix} 1 & 2 \\ 3 & 4 \end{pmatrix}, \ T = \begin{pmatrix} -2 & 1 \\ 1 & -2 \end{pmatrix}$

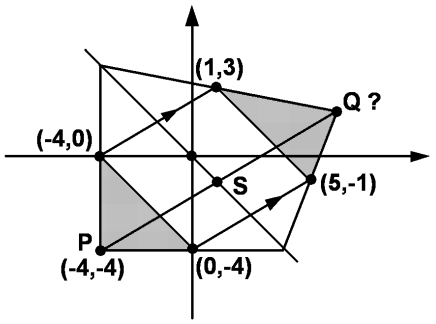
(a) $R \cdot T = ?$

(b) $T \cdot R = ?$

(c) $\vec{x} = \begin{pmatrix} x_1 \\ x_2 \end{pmatrix} \longmapsto \vec{y} = R \cdot \vec{x} \longmapsto \vec{z} = T \cdot \vec{y} = ?$

(d) $\vec{x} = \begin{pmatrix} x_1 \\ x_2 \end{pmatrix} \longmapsto\!\longmapsto M \cdot \vec{x} := (T \cdot R) \cdot \vec{y} = ?$

Probl. 4



$\overrightarrow{OP} \longmapsto M \cdot \overrightarrow{OP} = \overrightarrow{OQ}$

Matrix $M = ?$ • *Matrice* $M = ?$

$\overrightarrow{SQ} = \lambda \cdot \overrightarrow{SP}, \ \lambda = ?$

WIR