Übungen in AlgGeo ◇ Exercices en AlgGéo ◇ T. F1 ◇ II / 8

Probl. 1 $A = \begin{pmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \\ 7 & 8 & 9 \end{pmatrix}$

$B = \begin{pmatrix} 0 & 1 & 2 \\ 3 & 4 & 5 \\ 6 & 7 & 8 \end{pmatrix}$

(a) $A^2 := A \cdot A = ?$

(b) $A \cdot B = ?$

(c) $B \cdot A = ?$

Probl. 2 $C = \begin{pmatrix} 1 & 4 & -9 \\ 0 & 1 & 3 \\ 0 & 0 & 1 \end{pmatrix}$

$D = \begin{pmatrix} 1 & 1 & 1 \\ 0 & 1 & 1 \\ 0 & 0 & 1 \end{pmatrix}$

$F = \begin{pmatrix} 1 & 0 & 0 \\ 1 & 1 & 0 \\ 1 & 1 & 1 \end{pmatrix}$

(a) $C^2 = ?$

(b) $C \cdot D = ?$

(c) $D \cdot C = ?$

(d) $D \cdot F = ?$

(e) $D^2 = ?$

(f) $F \cdot D = ?$

Probl. 3 $G = \begin{pmatrix} 1 & 6 \\ -1 & 2 \end{pmatrix}$, $H = \begin{pmatrix} -2 & 1 \\ 3 & 4 \end{pmatrix}$, $P_0 = P_0(1,3) \hat{=} \vec{v}_0 = \begin{pmatrix} 1 \\ 3 \end{pmatrix}$

$P_0 \vdash\!\!- \overset{G}{-} \!\!\longrightarrow P_1 \vdash\!\!- \overset{H}{-} \!\!\longrightarrow P_2$

$P_0 \vdash\!\!- - \overset{H \circ G}{-} - \longrightarrow P_2$

(a) $H \cdot G = ?$

(b) $\vec{v}_1 = G \cdot \vec{v}_0 = ?$

(c) $\vec{v}_2 = H \cdot \vec{v}_1 = ?$

(d) $(H \cdot G) \cdot \vec{v}_0 = ?$