

Übungen in AlgGeo ◇ Exercices en AlgGéo ◇ T. E1 ◇ I / 14

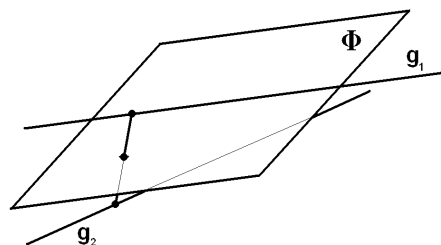
Probl. 1 Φ = Mittelebene • *Plan median*
 $(\Phi \parallel g_1, \Phi \parallel g_2)$

$$g_1 : \vec{r} = \begin{pmatrix} 2 \\ 1 \\ 3 \end{pmatrix} + t \cdot \begin{pmatrix} 1 \\ -2 \\ 1 \end{pmatrix}$$

$$g_2 : \vec{r} = \begin{pmatrix} -3 \\ -1 \\ 1 \end{pmatrix} + t \cdot \begin{pmatrix} -2 \\ 1 \\ 4 \end{pmatrix}$$

$$\Phi : Ax + By + Cz + D = 0, \quad \begin{pmatrix} A \\ B \\ C \end{pmatrix} = \vec{e}_n$$

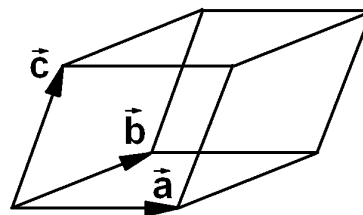
$$A, B, C, D = ?$$



Probl. 2 $\vec{a} = \begin{pmatrix} 5 \\ 2 \\ 1 \end{pmatrix}, \vec{b} = \begin{pmatrix} 1 \\ 4 \\ 8 \end{pmatrix}, \vec{c} = \begin{pmatrix} -2 \\ y \\ 4 \end{pmatrix}$

$$V = 100$$

$$y = ?$$



Probl. 3 $\vec{a} = \begin{pmatrix} 2 \\ 1 \\ 3 \end{pmatrix}, \vec{b} = \begin{pmatrix} -3 \\ -1 \\ 1 \end{pmatrix}, \vec{c} = \begin{pmatrix} 5 \\ 2 \\ 1 \end{pmatrix}$

$$\vec{d}_1 = (\vec{a} \times \vec{b}) \times \vec{c} = ?$$

$$\vec{d}_2 = \vec{a} \times (\vec{b} \times \vec{c}) = ?$$

$$\vec{d}_1 \times \vec{d}_2 = ?$$

Probl. 4
$$\begin{array}{lcl} 4x - 2y + 3z - 5 & = & 0 \\ 8x - 2y + 4z - 6 & = & 0 \\ 9x + \alpha y + \beta z + 4 & = & 0 \end{array}$$

$$x(\alpha, \beta) = ?$$

$$y(\alpha, \beta) = ?$$

$$z(\alpha, \beta) = ?$$

(Cramer)