

Pl 4 Ch 2 Intro

$$1) \pi_1: \vec{AB} \begin{pmatrix} -1 & -1 \\ 0 & -2 \\ 2 & -5 \end{pmatrix} = \begin{pmatrix} -2 \\ -2 \\ -3 \end{pmatrix} \quad \vec{AC} \begin{pmatrix} 3 & -1 \\ 2 & 2 \\ -3 & -5 \end{pmatrix} = \begin{pmatrix} 2 \\ 0 \\ -8 \end{pmatrix}$$

$$\vec{AB} \times \vec{AC} = \begin{pmatrix} -2 \\ -2 \\ -3 \end{pmatrix} \times \begin{pmatrix} 2 \\ 0 \\ -8 \end{pmatrix} = \begin{pmatrix} 16 \\ -(16+6) \\ 0+4 \end{pmatrix} = \begin{pmatrix} 16 \\ -22 \\ 4 \end{pmatrix} = \vec{n} \text{ vect } \perp \text{ à } \pi_1$$

$$P(x, y, z) \in \pi_1 \Leftrightarrow \vec{AP} \cdot \vec{n} = 0$$

$$\Leftrightarrow \begin{pmatrix} x-1 \\ y-2 \\ z-5 \end{pmatrix} \cdot \begin{pmatrix} 16 \\ -22 \\ 4 \end{pmatrix} = 0$$

$$\Leftrightarrow 16x - 22y + 4z - 16 + 44 - 20 = 0$$

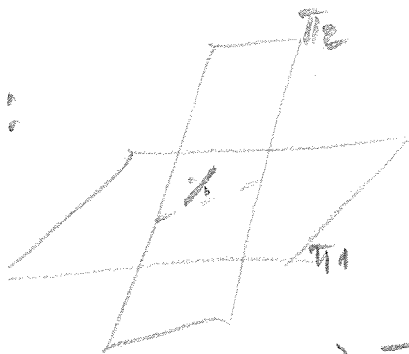
$$\Leftrightarrow 16x - 22y + 4z + 8 = 0 \Leftrightarrow [8x - 11y + 2z + 4 = 0]$$

$$A? \quad 8 - 22 + 10 + 4 \stackrel{?}{=} 0 \checkmark$$

$$B? \quad -8 + 4 + 4 \stackrel{?}{=} 0 \checkmark$$

$$C? \quad 24 - 22 - 6 + 4 \stackrel{?}{=} 0 \checkmark$$

$\pi_2:$



$\vec{n}$  vect dir de  $\pi_1$

$$\vec{DE} \begin{pmatrix} 1 & -1 \\ 1 & 3 \\ 1 & -0 \end{pmatrix} = \begin{pmatrix} 0 \\ 4 \\ 1 \end{pmatrix} \text{ aussi}$$

$$\vec{n} \times \vec{DE} = \begin{pmatrix} 16 \\ -22 \\ 4 \end{pmatrix} \times \begin{pmatrix} 0 \\ 4 \\ 1 \end{pmatrix} = \begin{pmatrix} -38 \\ -16 \\ 64 \end{pmatrix} = \vec{m} \text{ vect } \perp \text{ à } \pi_2$$

$$P(x, y, z) \in \pi_2 \Leftrightarrow \vec{EP} \cdot \vec{m} = 0$$

$$\Leftrightarrow \begin{pmatrix} x-1 \\ y-1 \\ z-1 \end{pmatrix} \cdot \begin{pmatrix} -38 \\ -16 \\ 64 \end{pmatrix} = 0 \Leftrightarrow \begin{aligned} -38x - 16y + 64z \\ + 38 + 16 - 64 = 0 \end{aligned}$$

$$\Leftrightarrow -38x - 16y + 64z - 10 = 0$$

$$\Leftrightarrow [19x + 8y - 32z + 5 = 0]$$

$$E? \quad 19 + 8 - 32 + 5 = 0 \checkmark$$

$$D? \quad 19 - 24 + 5 = 0 \checkmark$$

$$\begin{pmatrix} 19 \\ 8 \\ -32 \end{pmatrix} \cdot \begin{pmatrix} 8 \\ -11 \\ 2 \end{pmatrix} \neq 0 \quad 152 - 88 - 64 \neq 0 \checkmark$$

$\Pi_3$ :

$G(2; -1; 3) \in d$

$H(5; 4; 4) \in d$

$F(0; 1; 4) \in d$

$$\vec{FH} \begin{pmatrix} 5-2 \\ 4-(-1) \\ 4-3 \end{pmatrix} = \begin{pmatrix} 3 \\ 5 \\ 1 \end{pmatrix}$$

vect dir de  $\Pi_3$

$$\vec{FG} \begin{pmatrix} 2-0 \\ -1-1 \\ 3-4 \end{pmatrix} = \begin{pmatrix} 2 \\ -2 \\ -1 \end{pmatrix}$$

$$\vec{FH} \times \vec{FG} = \begin{pmatrix} 5 \\ 3 \\ 0 \end{pmatrix} \times \begin{pmatrix} 2 \\ -2 \\ -1 \end{pmatrix} = \begin{pmatrix} -3 \\ 5 \\ -16 \end{pmatrix} = \vec{r} \text{ vect } \perp \text{ à } \Pi_3$$

$$P(x, y, z) \in \Pi_3 \Leftrightarrow \vec{FP} \cdot \vec{r} = 0 \Leftrightarrow \begin{pmatrix} x-0 \\ y-1 \\ z-4 \end{pmatrix} \cdot \begin{pmatrix} -3 \\ 5 \\ -16 \end{pmatrix} = 0$$

$$\Leftrightarrow -3x + 5y - 16z - 5 + 64 = 0$$

$$\Leftrightarrow [3x - 5y + 16z - 59 = 0]$$

G?  $6 + 5 + 48 - 59 = 0 \checkmark$

H?  $15 - 20 + 64 - 59 = 0 \checkmark$

F?  $-5 + 64 - 59 = 0 \checkmark$

$\Pi_1 \wedge \Pi_2 \wedge \Pi_3$  :

$$\begin{cases} 8x - 11y + 2z + 4 = 0 \\ 19x + 8y - 32z + 5 = 0 \\ 3x - 5y + 16z - 59 = 0 \end{cases}$$

à résoudre ... bof ...

$$\begin{cases} 8x - 11y + 2z = -4 \\ 19x + 8y - 32z = -5 \\ 3x - 5y + 16z = 59 \end{cases}$$

$$\Leftrightarrow \begin{pmatrix} 8 & -11 & 2 \\ 19 & 8 & -32 \\ 3 & -5 & 16 \end{pmatrix} \begin{pmatrix} x \\ y \\ z \end{pmatrix} = \begin{pmatrix} -4 \\ -5 \\ 59 \end{pmatrix}$$

$$\Leftrightarrow \begin{pmatrix} x \\ y \\ z \end{pmatrix} = \begin{pmatrix} -16/1953 & 83/1953 & 8/93 \\ -200/1953 & 81/1953 & 7/93 \\ -17/1558 & 1/558 & 13/126 \end{pmatrix} \begin{pmatrix} -4 \\ -5 \\ 59 \end{pmatrix}$$
$$= \begin{pmatrix} 3187/651 \\ 3056/651 \\ 394/93 \end{pmatrix}$$

vérif:  $\checkmark$