Problema de la semana 8. Pablo Cuesta Sierra. 422974

(2) $P_1 = (-1, 2, -1, 0, 4)$. $P_2 = (0, -1, 3, 5, 1)$

$P_3 = (4, -2, 0, 0, -3)$. $P_4 = (3, -1, 2, 5, 2)$

$L = L(P_1, P_2, P_3, P_4) = P_1 + W$

$\overrightarrow{P_1P_2} = (1, -3, 4, 5, -3)$

$\overrightarrow{P_1P_3} = (5, -4, 1, 0, -7)$

$\overrightarrow{P_1P_4} = (4, -3, 3, 5, -2)$

$W = L(\overrightarrow{P_1P_2}, \overrightarrow{P_1P_3}, \overrightarrow{P_1P_4})$

~~Sea $X = (x, y, z, t, w) \in L$~~

$\Rightarrow \quad \vec{x} \in W \Rightarrow \vec{x} = (x, y, z, t, w)$,

$\vec{x} = \alpha \overrightarrow{P_1P_2} + \beta \overrightarrow{P_1P_3} + \gamma \overrightarrow{P_1P_4}$

~~1 5 4 x 1 5 4 x~~

$$\left(\begin{array}{ccc|c} 1 & 5 & 4 & x \\ -3 & -4 & -3 & y \\ 4 & 1 & 3 & z \\ 5 & 0 & 5 & t \\ -3 & -7 & -2 & w \end{array}\right) \sim \left(\begin{array}{ccc|c} 1 & 0 & 1 & \frac{t}{5} \\ 0 & -4 & 0 & y+\frac{3}{5}t \\ 4 & 1 & 3 & t \\ 1 & 5 & 4 & x \\ -3 & -7 & -2 & w \end{array}\right)$$

$$\sim \left(\begin{array}{ccc|c} 1 & 0 & 1 & \frac{1}{5}t \\ 0 & 1 & 0 & -\frac{1}{4}y-\frac{3}{20}t \\ 1 & 1 & 0 & z-\frac{3}{5}t \\ 1 & 5 & 4 & x \\ -3 & -7 & -2 & w \end{array}\right) \sim \left(\begin{array}{ccc|c} 1 & 0 & 1 & \frac{1}{5}t \\ 0 & 1 & 0 & -\frac{1}{4}y-\frac{3}{20}t \\ 1 & 0 & 0 & z+\frac{1}{4}y-\frac{9}{20}t \\ & & & \\ & & & \end{array}\right)$$

$$\left(\begin{array}{ccc|c} 1 & 0 & 0 & z+\frac{1}{4}y-\frac{9}{20}t=A \\ 0 & 1 & 0 & -\frac{1}{4}y-\frac{3}{20}t=B \\ 0 & 0 & 1 & -z-\frac{1}{4}y+\frac{13}{20}t=C \\ 1 & 5 & 4 & x \\ -3 & -7 & -2 & w \end{array}\right)$$

$A+5B+4C=x$

$\Downarrow$

$-3z-2y+\frac{7}{5}t=x$ (1)

$w+3A+7B+2C=0$

$w+z-\frac{3}{2}y-\frac{11}{10}t=0$

$$W=\left\{x+2y+3z-\frac{7}{5}t=0\,;\ -\frac{3}{2}y+z-\frac{11}{10}t+w=0\right\}$$

$$f_1(x,y,z,t,w)=x+2y+3z-\frac{7}{5}t$$
$$f_2(x,y,z,t,w)=-\frac{3}{2}y+z-\frac{11}{10}t+w$$

$X\in L \Rightarrow f_i(\vec{XP_1})=0 \Rightarrow f_i(\vec{OP_1}-\vec{OX})=0 \Rightarrow f_i(\vec{OX})=f_i(\vec{OP_1})$

$$L=\left\{(x_1,x_2,x_3,x_4,x_5)\ \middle|\ \left(x_1+2x_2+3x_3-\frac{7}{5}x_4\right)=0\,(=f_1(\vec{OP_1})) \wedge \left(-\frac{3}{2}x_2+x_3-\frac{11}{10}x_4+x_5\right)=0\,(=f_2(\vec{OP_1}))\right\}$$