Sistemas de 3 variáveis x/y/z

2) $\{\pi_1, \pi_2\}$

(2a) $\pi_1 \not\parallel \pi_2 \longrightarrow r_{12}$ $[\infty^1]$

(2b) $\pi_1 \parallel \pi_2 \longrightarrow [\times]$

$[\pi_1 \neq \pi_2]$

(2c) $\pi_1 = \pi_2 \longrightarrow [\infty^2]$

3) $\{\pi_1, \pi_2, \pi_3\}$

(3a1) $r_{12} \not\parallel \pi_3 \longrightarrow [1]$

(3a2) $r_{12} \parallel \pi_3 \longrightarrow [\times]$

$[r_{12} \not\subset \pi_3]$

(3a3) $r_{12} \in \pi_3 \longrightarrow [\infty^1]$

(3b) $[\times]$

(3c1) $\pi_1 = \pi_2 \not\parallel \pi_3 \longrightarrow r_{13}$ $[\infty^1]$

(3c2) $\pi_1 = \pi_2 \parallel \pi_3 \longrightarrow [\times]$

$[\pi_1 = \pi_2 \neq \pi_3]$

(3c3) $\pi_1 = \pi_2 = \pi_3 \longrightarrow [\infty^2]$

Exercício

$\pi_1 : (1,-2,1) + s\,(1,1,1) + t\,(-1,1,0)$

$\pi_2 : (3,2,1) + u\,(2,1,1) + v\,(1,1,2)$

$\boxed{1^a \text{ RESOLUÇÃO}}$

$$(a_1, b_1, c_1) = \left(\underset{-1}{\begin{vmatrix} \cancel{1} & 1 & 1 \\ \cancel{-1} & 1 & 0 \end{vmatrix}}, \underset{-1}{\begin{vmatrix} 1 & \cancel{1} & 1 \\ -1 & \cancel{1} & 0 \end{vmatrix}}, \underset{2}{\begin{vmatrix} 1 & 1 & \cancel{1} \\ -1 & 1 & \cancel{0} \end{vmatrix}} \right)$$

$$(a_2, b_2, c_2) = \left(\underset{1}{\begin{vmatrix} \cancel{2} & 1 & 1 \\ \cancel{1} & 1 & 2 \end{vmatrix}}, \underset{-3}{\begin{vmatrix} 2 & \cancel{1} & 1 \\ 1 & \cancel{1} & 2 \end{vmatrix}}, \underset{1}{\begin{vmatrix} 2 & 1 & \cancel{1} \\ 1 & 1 & \cancel{2} \end{vmatrix}} \right)$$

$\pi_1 : \; -x - y + 2z = d_1$

$\pi_2 : \; x - 3y + z = d_2$

$(1,-2,1) \in \pi_1 \qquad -1 + 2 + 2 = d_1 \qquad d_1 = 3$

$(3,2,1) \in \pi_2 \qquad 3 - 6 + 1 = d_2 \qquad d_2 = -2$

$\pi_1 : \quad x + y - 2z = -3$

$\pi_2 : \quad x - 3y + z = -2$

$z = r$

$$\begin{cases} x + y = 2r - 3 \\ x - 3y = -r - 2 \end{cases} \qquad \begin{array}{l} 4y = 3r - 1 \\ 4x = 5r - 11 \end{array}$$

$$\boxed{\left(-\frac{11}{4}, -\frac{1}{4}, 0\right) + r\left(\frac{5}{4}, \frac{3}{4}, 1\right)}$$

controle $\quad -\frac{11}{4} - \frac{1}{4} = -3 \ \checkmark \qquad -\frac{11}{4} + \frac{3}{4} = -2 \ \checkmark$

$\left(\frac{5}{4}, \frac{3}{4}, 1\right) \cdot (1, 1, -2) \qquad \left(\frac{5}{4}, \frac{3}{4}, 1\right) \cdot (1, -3, 1)$

$0 \ \checkmark \qquad 0 \ \checkmark$

2ª RESOLUÇÃO

$$\begin{cases} 1 + s - t = 3 + 2u + v \\ -2 + s + t = 2 + u + v \\ 1 + s = 1 + u + 2v \end{cases}$$

$$\begin{cases} s - t - 2u = v + 2 \\ s + t - u = v + 4 \\ s - u = 2v \end{cases} \rightarrow \quad s - 2u = 4 - v + v + 2 = 6 \qquad t = 4 - v$$

$$\begin{cases} s - 2u = 6 \\ s - u = 2v \end{cases} \rightarrow \quad u = 2v - 6 \quad \rightarrow \quad s = 2v + u = 4v - 6$$

$$\underset{(s\ ,\ t\ ,\ v)}{(4v - 6, 4 - v, 2v - 6)} = (-6, 4, -6) + v(4, -1, 2)$$

$\pi_1: \quad (1, -2, 1) + s(1, 1, 1) + t(-1, 1, 0)$

$(1, -2, 1) + (s - t, s + t, s)$

$(1, -2, 1) + (5v - 10, 3v - 2, 4v - 6)$

$$\boxed{(-9, -4, -5) + v(5, 3, 4)}$$

controle $\quad -9 - 4 + 10 = -3 \ \checkmark \qquad -9 + 12 - 5 = -2 \ \checkmark$

$(5, 3, 4) \cdot (1, 1, -2) \qquad (5, 3, 4) \cdot (1, -3, 1)$

$0 \ \checkmark \qquad 0 \ \checkmark$

Resolveremos os sistema com a técnica de ESCALONAMENTO !