Aula 1 Cálculo Numérico

$$\begin{cases} x + y + z = 6 \\ 2x - y - 3z = -9 \\ x + 2y + z = 8 \end{cases}$$

"Escalonamento"

$$\begin{array}{c} \\ L1 \\ L2 \\ L3 \end{array}\begin{pmatrix} \overset{x}{1} & \overset{y}{1} & \overset{z}{1} & 6 \\ 2 & -1 & -3 & -9 \\ 1 & 2 & 1 & 8 \end{pmatrix} \rightarrow \begin{pmatrix} 1 & 1 & 1 & 6 \\ 0 & 3 & 5 & 21 \\ 0 & 1 & 0 & 2 \end{pmatrix} \begin{matrix} \\ 2L_1 - L_2 \\ -L_1 + L_3 \end{matrix}$$

$2(1) - 2 = 0$
$2(1) - (-1) = 3$
$2(1) - (-3) = 5$
$2(6) - (-9) = 21$

$$\begin{pmatrix} 1 & 1 & 1 & 6 \\ 0 & 3 & 5 & 21 \\ 0 & 0 & 5 & 15 \end{pmatrix} \quad L_2 - 3L_3$$

$L_3 \rightarrow 5z = 15$
$z = 3$

$L_2 \rightarrow 3y + 5(3) = 21$
$3y = 21 - 15$
$3y = 6$
$y = 2$

$L_1 \rightarrow x + (2) + (3) = 6$
$x = 6 - 5 = 1$

$S = \{(1, 2, 3)\}$

$$\begin{cases} 2x + 2y + 4z = 14 \\ x + 3y - z = 8 \\ 2x - y + 3z = 7 \end{cases}$$

$x = 3$
$y = 2$
$z = 1$

$$\begin{matrix} x & y & z & \downarrow \end{matrix}$$
$$\begin{pmatrix} 2 & 2 & 4 & 14 \\ 1 & 3 & -1 & 8 \\ 2 & -1 & 3 & 7 \end{pmatrix} \begin{matrix} L1:2 \\ \rightarrow \end{matrix} \begin{pmatrix} 1 & 1 & 2 & 7 \\ 1 & 3 & -1 & 8 \\ 2 & -1 & 3 & 7 \end{pmatrix} \begin{matrix} L1 - L2 \\ 2L1 - L3 \end{matrix}$$

$$\begin{pmatrix} 1 & 1 & 2 & 7 \\ 0 & -2 & 3 & -1 \\ 0 & 3 & 1 & 7 \end{pmatrix} \begin{matrix} \\ 3L2 + 2L3 \end{matrix} \rightarrow \begin{pmatrix} 1 & 1 & 2 & 7 \\ 0 & -2 & 3 & -1 \\ 0 & 0 & 11 & 11 \end{pmatrix}$$

$L3 \rightarrow 11z = 11$

$z = 1$

$L2$

$-2y + 3(1) = -1$

$-2y = -1 - 3$

$-2y = -4 \ (-1)$

$2y = 4$

$y = \frac{4}{2} = 2$

$L1 \rightarrow x + (2) + 2(1) = 7$

$x + 4 = 7 \Rightarrow x = 7 - 4$

$x = 3$

$S = \{(3, 2, 1)\}$

$$\begin{cases} x + y + z = 6 \\ 4x + 2y - z = 5 \\ x + 3y + 2z = 13 \end{cases}$$