Ejercicios 15 y 16

15) $x_1 - 6x_2 = 5$

$x_2 - 4x_3 + x_4 = 0$

$-x_1 + 6x_2 + x_3 + 5x_4 = 3$

$-x_2 + 5x_3 + 4x_4 = 0$

	x_1	x_2	x_3	x_4	
	1	-6	0	0	= 5
	0	1	-4	1	= 0
−	-1	6	1	5	= 3
	0	-1	5	4	= 0

$F_3 + F_1$

+	1	-6	0	0	5
	-1	6	1	5	3
	0	0	1	5	8

	1	-6	0	0	= 5
	0	1	-4	1	= 0
	-1	6	1	5	= 3
	0	-1	5	4	= 0

$F_1 + F_3$

$6(\rightarrow$

1	-6	0	0	= 5
0	1	-4	1	= 0
0	0	1	5	= 8
0	-1	5	4	= 0

$6($

0	1	-4	1	0
0	6	-24	6	0
1	-6	0	0	5
1	0	-24	6	0

$$\begin{bmatrix} 1 & 0 & -2 & 4 & 6 & 0 \\ 0 & 1 & -4 & 1 & 0 \\ 0 & 0 & 1 & 5 & 8 \\ 0 & -1 & 5 & 4 & 0 \end{bmatrix} \quad F2+F4$$

$$\begin{array}{r} 0\ 1\ -4\ 1\ 0 \\ 0\ -1\ 5\ 4\ 0 \\ \hline 0\ 0\ 1\ 5\ 0 \end{array}$$

$$\begin{bmatrix} 1 & 0 & -2 & 4 & 6 & 0 \\ 0 & 1 & -4 & 1 & 0 \\ 0 & 0 & 1 & 5 & 8 \\ 0 & 0 & 1 & 5 & 0 \end{bmatrix} \quad F3-F4$$

$$\begin{array}{r} 0\ 0\ 1\ 5\ 8 \\ -0\ 0\ 1\ 5\ 0 \\ \hline 0\ 0\ 0\ 0\ 8 \end{array}$$

$$\begin{bmatrix} 1 & 0 & -2 & 4 & 6 & 0 \\ 0 & 1 & -4 & 1 & 0 \\ 0 & 0 & 1 & 5 & 8 \\ 0 & 0 & 0 & 0 & 8 \end{bmatrix}$$

No tiene Solución

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16) $2x_1 \quad -4x_4 = -10$

$+3x_2 + 3x_3 = 0$

$x_3 + 4x_4 = -7$

$-3x_1 + 2x_2 + 3x_3 + x_4 = 5$

$$\begin{bmatrix} 2 & 0 & 0 & -4 & -10 \\ 0 & 3 & 3 & 0 & 0 \\ 0 & 0 & 1 & 4 & -7 \\ -3 & 2 & 3 & 1 & 5 \end{bmatrix} \quad F_1/2$$

$$\begin{array}{r} 2\ 0\ 0\ -4\ -10 \\ \hline 1\ 0\ 0\ -2\ -5 \end{array}$$

$$\begin{bmatrix} 1 & 0 & 0 & -2 & -5 \\ 0 & 3 & 3 & 0 & 0 \\ 0 & 0 & 1 & 4 & -7 \\ -3 & 2 & 3 & 1 & 5 \end{bmatrix} \quad 3(F_1)+F_4$$

$$\begin{array}{r} 3(1\ 0\ 0\ -2\ -5] \\ +3\ 0\ 0\ -6\ -15 \\ \hline -3\ 2\ 3\ 1\ 5 \\ 0\ 2\ 3\ -5\ 10 \end{array}$$

$$\begin{bmatrix} 1 & 0 & 0 & -2 & -5 \\ 0 & 3 & 3 & 0 & 0 \\ 0 & 0 & 1 & 4 & -7 \\ 0 & 2 & 3 & -5 & 10 \end{bmatrix} \quad F_2/3$$

$$\begin{array}{r|l} 3 & 0\ 3\ 3\ 0\ 0 \\ \hline & 0\ 1\ 1\ 0\ 0 \end{array}$$

$$\begin{bmatrix} 1 & 0 & 0 & -2 & -5 \\ 0 & 1 & 1 & 0 & 0 \\ 0 & 0 & 1 & 4 & -1 \\ 0 & 2 & 3 & -5 & -10 \end{bmatrix} \quad F4/2 \quad \begin{matrix} 0 & 2 & 3 & -5 & -10 \\ 0 & 1 & 3/2 & -5/2 & -5 \end{matrix}$$

$$\begin{bmatrix} 1 & 0 & 0 & -2 & -5 \\ 0 & 1 & 1 & 0 & 0 \\ 0 & 0 & 1 & 4 & -1 \\ 0 & 1 & 3/2 & -5/2 & -5 \end{bmatrix} \quad F2-F4 \quad \begin{matrix} 0 & 1 & 1 & 0 & 0 \\ - & 0 & 1 & 3/2 & -5/2 & -5 \\ \hline 0 & 0 & -1/2 & -5/2 & -5 \end{matrix}$$

$$\begin{bmatrix} 1 & 0 & 0 & -2 & -5 \\ 0 & 1 & 1 & 0 & 0 \\ 0 & 0 & 1 & 4 & 1 \\ 0 & 0 & 1/2 & -5/2 & -5 \end{bmatrix} \quad \begin{matrix} F3 \times 1/2 & (0 & 0 & 1/2 & 2 & 1/2) \\ F3-F4 & 0 & 0 & -1/2 & -5/2 & -5) \\ \hline & 0 & 0 & 0 & -1/2 & -9/2 \end{matrix}$$

$x_1 \; x_2 \; x_3 \; x_4 = LD$

$$\begin{bmatrix} 1 & 0 & 0 & -2 & -5 \\ 0 & 1 & 1 & 0 & 0 \\ 0 & 0 & 1 & 4 & 1 \\ 0 & 0 & 0 & -1/2 & -9/2 \end{bmatrix} \quad F4/-\frac{1}{2} \quad \begin{matrix} 0 & 0 & 0 & -1/2 & -9/2 \\ \hline 0 & 0 & 0 & 1 & 9 \end{matrix}$$

$$\begin{bmatrix} 1 & 0 & 0 & -2 & -5 \\ 0 & 1 & 1 & 0 & 0 \\ 0 & 0 & 1 & 4 & 1 \\ 0 & 0 & 0 & 1 & 9 \end{bmatrix}$$

$$\begin{aligned} x_1 \quad\quad\quad - 2x_4 &= -5 \\ x_2 + x_3 \quad\quad &= 0 \\ x_3 + 4x_4 &= \\ x_4 &= 9 \end{aligned}$$

$x_3 + 4x_4 = 1$

$x_3 + 4(9) = 1 \Rightarrow x_3 + 36 = 1$

$\boxed{x_3 = -35}$

$x_2 + x_3 = 0$

$x_2 - 35 = 0 \Rightarrow \boxed{x_2 = 35}$

$x_1 - 2x_4 = -5$

$x_1 - 2(9) = -5 \Rightarrow x - 18 = -5$

$\boxed{x_1 = 13}$