Evaluación #3

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Solución

1. $2x_1 + 2x_2 - x_3 = 8$
$5x_1 + 5x_2 + 3x_3 = 9$
$4x_2 - 2x_3 = 14$

$$\left(\begin{array}{ccc|c} 2 & 2 & -1 & 8 \\ 5 & 5 & 3 & 9 \\ 0 & 4 & -2 & 14 \end{array}\right) \quad f_1 = \tfrac{1}{2} \times f_2$$

$$\left(\begin{array}{ccc|c} 1 & 1 & -1/2 & 4 \\ 5 & 5 & 3 & 9 \\ 0 & 4 & -2 & 14 \end{array}\right) \quad f_2 = -5 \times f_1 + f_2$$

$$\left(\begin{array}{ccc|c} 1 & 1 & -1/2 & 4 \\ 0 & 0 & 11/2 & -11 \\ 0 & 4 & -2 & 14 \end{array}\right) \quad f_2 \leftrightarrow f_3$$

$$\left(\begin{array}{ccc|c} 1 & 1 & -1/2 & 4 \\ 0 & 4 & -2 & 14 \\ 0 & 0 & 11/2 & -11 \end{array}\right) \quad f_2 = 1/4 \times f_2$$

$$\left(\begin{array}{ccc|c} 1 & 1 & -1/2 & 4 \\ 0 & 1 & -1/2 & 7/2 \\ 0 & 0 & 11/2 & -11 \end{array}\right) \quad f_1 = -1 \times f_2 + f_1$$

$$\left(\begin{array}{ccc|c} 1 & 0 & 0 & 1/2 \\ 0 & 1 & -1/2 & 7/2 \\ 0 & 0 & 11/2 & -11 \end{array}\right) \quad f_3 = \tfrac{2}{11} \times f_3$$

$$\left(\begin{array}{ccc|c} 1 & 0 & 0 & 1/2 \\ 0 & 1 & -1/2 & 7/2 \\ 0 & 0 & 1 & -2 \end{array}\right) \quad f_2 = \tfrac{1}{2} f_3 + f_2$$

$$\left(\begin{array}{ccc|c} 1 & 0 & 0 & 1/2 \\ 0 & 1 & 0 & 5/2 \\ 0 & 0 & 1 & -2 \end{array}\right)$$

$x_1 = 1/2$
$x_2 = 5/2$
$x_3 = -2$

2. $A = \begin{pmatrix} 1 & 0 & -1 \\ 2 & 0 & 2 \\ 8 & 2 & -3 \end{pmatrix}^{-1}$

$$= \left(\begin{array}{ccc|ccc} 1 & 0 & -1 & 1 & 0 & 0 \\ 2 & 0 & 2 & 0 & 1 & 0 \\ 8 & 2 & -3 & 0 & 0 & 1 \end{array}\right) \quad F_1 \leftrightarrow F_3$$

$$= \left(\begin{array}{ccc|ccc} 8 & 2 & -3 & 0 & 0 & 1 \\ 2 & 0 & 2 & 0 & 1 & 0 \\ 1 & 0 & -1 & 1 & 0 & 0 \end{array}\right) \quad F_2 \leftarrow F_2 - \tfrac{1}{4} \cdot f_1$$

$$= \left(\begin{array}{ccc|ccc} 8 & 2 & -3 & 0 & 0 & 1 \\ 0 & -\frac{1}{2} & \frac{11}{4} & 0 & 1 & -\frac{1}{4} \\ 1 & 0 & -1 & 1 & 0 & 0 \end{array}\right) \quad F_3 \leftarrow F_3 - \tfrac{1}{8} \cdot f_1$$

$$= \left(\begin{array}{ccc|ccc} 8 & 2 & 3 & 1 & 0 & 0 & 1 \\ 0 & -\frac{1}{2} & \frac{11}{4} & 0 & 1 & -\frac{1}{4} \\ 0 & -\frac{1}{4} & -\frac{5}{8} & 1 & 0 & -\frac{1}{8} \end{array}\right) \quad F_3 \leftarrow F_3 - \tfrac{1}{2} \cdot F_2$$

$$= \left(\begin{array}{ccc|ccc} 8 & 2 & -3 & 0 & 0 & 1 \\ 0 & -\frac{1}{2} & \frac{11}{4} & 0 & 1 & -\frac{1}{4} \\ 0 & 0 & -2 & 1 & -\frac{1}{2} & 0 \end{array}\right) \quad F_3 \leftarrow -\tfrac{1}{2} \cdot F_3$$

$$= \left(\begin{array}{ccc|ccc} 8 & 2 & -3 & 0 & 0 & 1 \\ 0 & -\frac{1}{2} & \frac{11}{4} & 0 & 1 & -\frac{1}{4} \\ 0 & 0 & 1 & -\frac{1}{2} & \frac{1}{4} & 0 \end{array}\right) \quad F_2 \leftarrow F_2 - \tfrac{11}{4} \cdot F_3$$

$$= \left(\begin{array}{ccc|ccc} 8 & 2 & -3 & 0 & 0 & 1 \\ 0 & -\frac{1}{2} & 0 & 1\frac{1}{8} & \frac{5}{16} & -\frac{1}{4} \\ 0 & 0 & 1 & -\frac{1}{2} & \frac{1}{4} & 0 \end{array}\right) \quad F_1 \leftarrow F_1 + 3 \cdot F_3$$

$$= \left(\begin{array}{ccc|ccc} 8 & 2 & 0 & -\frac{3}{2} & \frac{3}{4} & 1 \\ 0 & -\frac{1}{2} & 0 & 1\frac{1}{8} & \frac{5}{16} & -\frac{1}{4} \\ 0 & 0 & 1 & -\frac{1}{2} & \frac{1}{4} & 0 \end{array}\right) \quad F_2 \leftarrow -2 \cdot f_2$$

$$\left(\begin{array}{ccc|ccc} 8 & 2 & 0 & -\frac{3}{2} & \frac{3}{4} & 1 \\ 0 & 1 & 0 & -1\frac{1}{4} & -\frac{5}{8} & \frac{1}{2} \\ 0 & 0 & 1 & -\frac{1}{2} & \frac{1}{4} & 0 \end{array}\right) \quad F_1 \leftarrow F_1 - 2 \cdot F_2$$

$$\left(\begin{array}{ccc|ccc} 8 & 0 & 0 & 4 & 2 & 0 \\ 0 & 1 & 0 & -\frac{11}{4} & -\frac{5}{8} & \frac{1}{2} \\ 0 & 0 & 1 & -\frac{1}{2} & \frac{1}{4} & 0 \end{array}\right) \quad F_1 \leftarrow \tfrac{1}{8} \cdot F_1$$

$$\left(\begin{array}{ccc|ccc} 1 & 0 & 0 & \frac{1}{2} & \frac{1}{4} & 0 \\ 0 & 1 & 0 & & & \\ 0 & 0 & 1 & -11/4 & -5/8 & 1/2 \\ & & & -\frac{1}{2} & \frac{1}{4} & 0 \end{array}\right)$$

$$= \begin{pmatrix} \frac{1}{2} & \frac{1}{4} & 0 \\ -11/4 & -5/8 & \frac{1}{2} \\ -\frac{1}{2} & \frac{1}{4} & 0 \end{pmatrix}$$

3.

x	y
1	7,4
3	6,2
5	4,5
7	3,3
9	1,8
11	0

x	y	x*y	x^2
1	7,4	7,4	1
3	6,2	18,6	9
5	4,5	22,5	25
7	3,3	23,1	49
9	1,8	16,2	81
11	0	0	121
$\sum = 36$	23,2	87,8	286

Promedio = 36/6 23,0/6
6 3,8666

$$a_1 = \frac{6 \cdot 87,8 - 36 \cdot 23,2}{6 \cdot 286 - 36^2}$$

$$a_1 = -0,7342857143$$

$$a_0 = 3,8666 - (-0,7342857143) \cdot 6$$

$$a_0 = 8,27238095$$

Ecuación de la recta $+\cdot(-) = -$

$$y = 8,27238095 - 0,7342857143x$$