

SISTEMAS LINEALES

$$a) E_1: \frac{2(x-1)}{3} - \frac{1-y}{2} = -\frac{1}{3} \xrightarrow{6E_1} 4(x-1) - 3(1-y) = -2$$

$$E_2: \frac{x+1}{2} + \frac{2(y+2)}{5} = \frac{19}{10} \xrightarrow{10E_2} 5(x+1) + 4(y+2) = 19$$

$$\left. \begin{array}{l} 4x - 4 - 3 + 3y = -2 \\ 5x + 5 + 4y + 8 = 19 \end{array} \right\} \begin{array}{l} 4x + 3y = 5 \\ 5x + 4y = 6 \end{array} \quad \left. \begin{array}{l} \text{Por} \\ \text{reducción} \end{array} \right\}$$

$$\begin{array}{l} \cdot (-5) \\ \cdot (4) \end{array} \left\{ \begin{array}{l} -20x - 15y = -25 \\ 20x + 16y = 24 \end{array} \right. \rightarrow y = -1$$

$$\begin{array}{l} 4x + 3(-1) = 5 \\ 4x - 3 = 5 \rightarrow 4x = 8 \\ x = \frac{8}{4} \Rightarrow x = 2 \end{array}$$

Solución (2, -1)

$$b) E_1: \frac{4(x-1)}{3} - \frac{2y+1}{2} = \frac{3}{2} \xrightarrow{6E_1} 8(x-1) - 3(2y+1) = 9$$

$$E_2: \frac{2x}{5} - \frac{2(y-1)}{3} = \frac{12}{5} \xrightarrow{15E_2} 6x - 10(y-1) = 36$$

$$\left. \begin{array}{l} 8x - 8 - 6y - 3 = 9 \\ 6x - 10y + 10 = 36 \end{array} \right\} \left. \begin{array}{l} 8x - 6y = 20 \\ 6x - 10y = 26 \end{array} \right\} \left. \begin{array}{l} 4x - 3y = 10 \\ 3x - 5y = 13 \end{array} \right\}$$

$$\begin{array}{l} -12x + 9y = -30 \\ 12x - 20y = 52 \end{array} \rightarrow -11y = 22 \rightarrow y = -2$$

$$\begin{array}{l} 4x - 3(-2) = 10 \\ 4x + 6 = 10 \\ 4x = 4 \Rightarrow x = 1 \end{array}$$

Soluc: (1, -2)

$$c) \left. \begin{array}{l} E_1: \frac{2(x-3)}{3} + x = -\frac{y}{15} \xrightarrow{15E_1} 10(x-3) + 15x = -y \\ E_2: \frac{y+1}{2} - 2(x-1) = 3 \xrightarrow{2E_2} y+1 - 4(x-1) = 6 \end{array} \right\}$$

$$\left. \begin{array}{l} 10x - 30 + 15x = -y \\ y + 1 - 4x + 4 = 6 \end{array} \right\} \begin{array}{l} 25x + y = 30 \\ -4x + y = 1 \end{array} \left\} \begin{array}{l} 25x + y = 30 \\ 4x - y = -1 \\ \hline 29x = 29 \end{array}$$

$$-4 \cdot 1 + y = 1; y = 4 + 1; \boxed{y = 5}$$

$$\boxed{x = 1}$$

$\boxed{\text{Soln } (1, 5)}$

$$d) \left. \begin{array}{l} E_1: \frac{2(x-1)}{3} - \frac{-y+2}{2} = \frac{x}{4} \xrightarrow{12E_1} 8(x-1) - 6(-y+2) = 3x \\ E_2: y - \frac{3(x+y)}{2} = -6 \xrightarrow{2E_2} 2y - 3(x+y) = -12 \end{array} \right\}$$

$$\left. \begin{array}{l} 8x - 8 + 6y - 12 = 3x \\ 2y - 3x - 3y = -12 \end{array} \right\} \begin{array}{l} 5x + 6y = 20 \\ -3x - y = -12 \end{array} \left\} \begin{array}{l} 5x + 6y = 20 \\ -18x - 6y = -72 \\ \hline -13x = -52 \end{array}$$

$$-3 \cdot 4 - y = -12$$

$$-12 - y = -12$$

$$-y = 0; \boxed{y = 0}$$

$$\boxed{x = 4}$$

$\boxed{\text{Solución } (4, 0)}$

$$e) \begin{cases} E_1: \frac{3(x-2)}{4} + \frac{2(y-3)}{5} = \frac{2}{5} \xrightarrow{20E_1} 15(x-2) + 8(y-3) = 8 \\ E_2: \frac{2(y-4)}{3} + \frac{3(x-1)}{2} = \frac{3}{2} \xrightarrow{6E_2} 4(y-4) + 9(x-1) = 9 \end{cases}$$

$$\begin{cases} 15x - 30 + 8y - 24 = 8 \\ 4y - 16 + 9x - 9 = 9 \end{cases} \Rightarrow \begin{cases} 15x + 8y = 62 \\ 9x + 4y = 34 \end{cases} \Rightarrow \begin{cases} 15x + 8y = 62 \\ -17x - 7y = -68 \end{cases}$$

$$\begin{array}{r} 15x + 8y = 62 \\ -17x - 7y = -68 \\ \hline -3x = -6 \end{array}$$

$$x = 2$$

$$9 \cdot 2 + 4y = 34; 4y = 34 - 18$$

$$4y = 16 \Rightarrow y = 4$$

$$\boxed{\text{Soluc. } (2, 4)}$$

$$f) \begin{cases} E_1: \frac{3(x-1)}{2} + \frac{2(y-2)}{3} = \frac{13}{6} \xrightarrow{6E_1} 9(x-1) + 4(y-2) = 13 \\ E_2: \frac{3(x+1)}{2} - \frac{2(y+2)}{5} = \frac{5}{2} \xrightarrow{10E_2} 15(x+1) - 4(y+2) = 25 \end{cases}$$

$$\begin{cases} 9x - 9 + 4y - 8 = 13 \\ 15x + 15 - 4y - 8 = 25 \end{cases} \Rightarrow \begin{cases} 9x + 4y = 30 \\ 15x - 4y = 18 \end{cases}$$

$$\begin{array}{r} 9x + 4y = 30 \\ 15x - 4y = 18 \\ \hline 24x = 48; x = 2 \end{array}$$

$$9 \cdot 2 + 4y = 30 \Rightarrow 4y = 12 \Rightarrow y = 3$$

$$\boxed{\text{Solution: } (2, 3)}$$