

SISTEMAS DE ECUACIONES II

SEMANA 04/05

$$\textcircled{1} \quad \begin{cases} 2x - y = 11 \\ 3x + 2y = 6 \end{cases}$$

Despejo y en E_1 : $2x - 11 = y$

Sustituyo en E_2 :

$$3x + 2y = 6$$

$$3x + 2 \cdot (2x - 11) = 6$$

Resuelvo :

$$3x + 4x - 22 = 6$$

$$7x = 28$$

$$\boxed{x = 4}$$

Calculo y : $\boxed{y} = 2x - 11 = 2 \cdot 4 - 11 = \boxed{-3}$

Solución: $\begin{cases} x = 4 \\ y = -3 \end{cases}$

$$\textcircled{2} \quad \begin{cases} 2x - 5y = 0 \\ 4x + 5y = 3 \end{cases}$$

Despejo x en E_1 : $x = \frac{5y}{2}$

Sustituyo en E_2 : $4 \cdot x + 5y = 3$

$$4 \cdot \frac{5y}{2} + 5y = 3 \Rightarrow 10y + 5y = 3$$

Resuelvo: $15y = 3$
 $y = \frac{3}{15}$
 $y = \frac{1}{5}$

Calculo x: $x = \frac{5y}{2} = \frac{5 \cdot \frac{1}{5}}{2} = \frac{1}{2}$

Solución: $\begin{cases} x = \frac{1}{2} \\ y = \frac{1}{5} \end{cases}$

2.

a) $\begin{cases} 3x + 10y = 1 \\ 2x + 5y = -1 \end{cases}$

Despejo x en E_1 y E_2 :
 E_1 $x = \frac{1-10y}{3}$

$x = \frac{-1-5y}{2}$

Igualo:

$\frac{1-10y}{3} = \frac{-1-5y}{2}$

Resuelvo: $\frac{2-20y}{6} = \frac{-3-15y}{6}$

$2-20y = -3-15y$

$-5y = -5$

$y = 1$

Calculo x: $x = \frac{1-10y}{3} = \frac{1-10}{3} = \frac{-9}{3} = -3$

Solución: $\begin{cases} x = -3 \\ y = 1 \end{cases}$

$$b) \begin{cases} 6x + 4y = 5 \\ 3x - 8y = 0 \end{cases}$$

Despejo y en E_1 y E_2 : $y = \frac{5-6x}{4}$

$$y = \frac{-3x}{-8} = \frac{3x}{8}$$

Igualo: $\frac{5-6x}{4} = \frac{3x}{8}$

Resuelvo: $8 \cdot (5-6x) = 4 \cdot 3x$

$$40 - 48x = 12x$$

$$-48x - 12x = -40$$

$$-60x = -40$$

$$x = \frac{-40}{-60} = +\frac{2}{3}$$

Calculo y: $y = \frac{3x}{8} = \frac{3 \cdot (+\frac{2}{3})}{8} = \frac{+2}{8} = +\frac{1}{4}$

Solución: $\begin{cases} x = \frac{2}{3} \\ y = \frac{1}{4} \end{cases}$

3.-

$$\begin{cases} 5x - y = 12 \\ 6x + 7y = -2 \end{cases}$$

Reduzco x

Multipliquo la E_1 por 6
" " E_2 por -5

$$\begin{array}{r} \downarrow \\ 6 \cdot E_1 \\ -5 E_2 \end{array}$$

$$\begin{array}{r} 30x - 6y = 72 \\ -30x - 35y = +10 \\ \hline -41y = 82 \end{array}$$

Sumando $\rightarrow$

$$y = -2$$

Reducir y:

$$7E_1: 35x - 7y = 84$$

$$E_2: 6x + 7y = -2$$

Sumamos →

$$41x = 82$$

$$(x=2)$$

SOLUCIÓN:

$$x=2$$

$$y=-2$$

$$b) \begin{cases} 3x + 12y = -3 \\ 6x + 9y = -1 \end{cases}$$

Reducir x:

$$-2E_1: -6x - 24y = +6$$

$$E_2: 6x + 9y = -1$$

Sumo →

$$-15y = +5$$

$$y = -\frac{5}{15} = -\frac{1}{3}$$

Reducir y:

$$9E_1: 27x + 108y = -27$$

$$-12 \cdot E_2: -72x - 108y = +12$$

$$-45x$$

$$= -15$$

$$x = \frac{-15}{-45} = +\frac{1}{3}$$

SOLUCIÓN: $x = \frac{1}{3}$

$$y = -\frac{1}{3}$$