



**Nombre de alumno:** Danna Belén Rivera Escobar

**Nombre del profesor:** Juan José Ojeda

**Nombre del trabajo:** Examen

**Materia:** Matemáticas administrativas

**Grado:** 2do. Cuatrimestre. Administración y estrategias de negocios

**Grupo:** A

Comitán de Domínguez Chiapas a 14 de abril del 2021

# Sustitución

Danna Rivera  
14/04/2021

$$A: 5x + 2y + 4z = 12 \quad (1)$$

$$-3x + 3y + 3z = 56 \quad (2)$$

$$2x - y - z = 69 \quad (3)$$

• Despejar  $x$  en (1) =  $x = \frac{12 - 2y - 4z}{5}$

• Sustituir  $x$  = 
$$\left[ \begin{array}{l} -3 \cdot \frac{12 - 2y - 4z}{5} + 3y + 3z = 56 \\ 2 \cdot \frac{12 - 2y - 4z}{5} - y - z = 69 \end{array} \right]$$

• Resolver: 
$$\left[ \begin{array}{l} \frac{21y + 27z - 36}{5} = 56 \quad (4) \\ \frac{-9y - 13z + 24}{5} = 69 \quad (5) \end{array} \right]$$

• Despejar  $y$  en (4) =  $y = \frac{-27z + 316}{21} \quad (6)$

• Sustituir  $y$  en (5) = 
$$\left[ \begin{array}{l} \frac{-9 \cdot \frac{-27z + 316}{21} - 13z + 24}{5} = 69 \\ = \frac{-2(z + 78)}{7} = 69 \quad (7) \end{array} \right]$$

• Despejar  $z$  en (7) =  $z = -\frac{639}{2}$  • Sustituir en (6) =  $y = \frac{-27 \left(-\frac{639}{2}\right) + 316}{21} =$

• Sustituir  $z$  y  $y$  en  $x = \frac{12 - 2y - 4z}{5}$  =  $x = \frac{12 - 2 \cdot \frac{2555}{6} - 4 \left(-\frac{639}{2}\right)}{5} = \frac{263}{3}$

$x = \frac{263}{3}, z = \frac{639}{2}, y = \frac{2555}{6}$

14/04/2021

$$\text{B.} \begin{cases} 5x + 2y - 3z = 22 & \textcircled{1} \\ x + 2y - 9z = 22 & \textcircled{2} \\ 4x + 3y + 8z = 45 & \textcircled{3} \end{cases}$$

• Despejar  $x$  en  $\textcircled{1} = x = \frac{22 - 2y + 3z}{5}$

• Sustituir  $\left[ \begin{array}{l} \frac{22 - 2y + 3z}{5} + 2y - 9z = 22 \\ 4 \cdot \frac{22 - 2y + 3z}{5} + 3y + 8z = 45 \end{array} \right]$

• Simplificar  $\left[ \begin{array}{l} \frac{8y - 42z + 22}{5} = 22 & \textcircled{4} \\ \frac{7y + 52z + 88}{5} = 45 & \textcircled{5} \end{array} \right]$

• Despejar  $y$  en  $\textcircled{4} = y = \frac{21z + 44}{4}$

• Sustituir  $\left[ \begin{array}{l} 7 \cdot \frac{21z + 44}{4} + 52z + 88 \\ \hline 5 \end{array} \right] = 45 = \left[ \frac{7z + 132}{4} = 45 \right] \textcircled{6}$

• Despejar  $z$  en  $\textcircled{6} = z = \frac{48}{71}$

• Sustituir  $y = \frac{21 \cdot \frac{48}{71} + 44}{4} \quad y = \frac{1033}{71}$

• Sustituir  $z, y$  en  $x = \frac{22 - 2y + 3z}{5} = x = \frac{22 - 2 \cdot \frac{1033}{71} + 3 \cdot \frac{48}{71}}{5}$

$$x = -\frac{72}{71}, \quad z = \frac{48}{71}, \quad y = \frac{1033}{71}$$

1-

$$A = \begin{pmatrix} 5 & 2 & 4 & 12 \\ -3 & 3 & 3 & 56 \\ 2 & -1 & -1 & 69 \end{pmatrix} \quad 3 \times 4$$

No se pueden multiplicar porque ambas son  $3 \times 4$

$$B = \begin{pmatrix} 5 & 2 & -3 & 22 \\ 1 & 2 & -9 & 22 \\ 4 & 3 & 8 & 45 \end{pmatrix} \quad 3 \times 4$$

2-

$$A = \begin{pmatrix} 5 & 2 & 4 & 12 \\ -3 & 3 & 3 & 56 \\ 2 & -1 & -1 & 69 \end{pmatrix}$$

$$B = \begin{pmatrix} 5 & 2 & -3 & 22 \\ 1 & 2 & -9 & 22 \\ 4 & 3 & 8 & 45 \end{pmatrix}$$

$$A+B = \begin{pmatrix} 10 & 4 & 1 & 34 \\ -2 & 5 & -6 & 78 \\ 6 & 2 & 7 & 114 \end{pmatrix}$$

3- A-

$$\begin{cases} 5x + 2y + 4z = 12 \\ -3x + 3y + 3z = 56 \\ 2x - y - z = 69 \end{cases}$$

$$\Delta S = \begin{vmatrix} 5 & 2 & 4 \\ -3 & 3 & 3 \\ 2 & -1 & -2 \end{vmatrix} = (-30 + 12 + 12) - (24 - 15 + 12) = (-6) - (21) = -6 - 21 = -21$$

$$\Delta S = -21$$

$$\Delta x = \begin{vmatrix} 12 & 2 & 4 & 12 & 2 \\ 56 & 3 & 3 & 56 & 3 \\ 69 & -1 & -1 & 69 & -1 \end{vmatrix}$$

$$\Delta x = (-36 + 414 - 224) - (828 - 36 - 112)$$

$$= 154 - 680$$

$$\Delta x = -526$$

$$\Delta y = \begin{vmatrix} 5 & 12 & 4 \\ -3 & 56 & 3 \\ 2 & 69 & -1 \end{vmatrix} = (-280 - 828 + 72) - (448 + 1,035 + 36)$$

$$= (-1,036) - (1,519) = -2,555$$

$$\Delta y = -2,555$$

$$\Delta z = \begin{vmatrix} 5 & 2 & 12 & 5 & 2 \\ -3 & 3 & 56 & -3 & 3 \\ 2 & -1 & 69 & 2 & -1 \end{vmatrix} = (1,035 + 224 + 36) - (72 - 280 - 414)$$

$$= (1,295) - (-622) = 1,917$$

$$\Delta z = 1,917$$

$$x = \frac{-526}{-21} = 25.04$$

$$y = \frac{-2,555}{-21} = 121.66$$

$$z = \frac{1,917}{-21} = -91.28$$

#### 4. Eliminación

$$\begin{aligned} B. \quad & 5x + 2y - 3z = 22 \\ & x + 2y - 9z = 22 \\ & 4x + 3y + 8z = 45 \end{aligned}$$

$$\begin{cases} 5x + 2y - 3z = 22 \\ x + 2y - 9z = 22 \\ 5x + 2y - 3z = 22 \\ 4x + 3y + 8z = 45 \end{cases}$$

- Resolver

$$4x + 6z = 0$$

$$7x - 25z = -24$$

$$z = \frac{48}{71} \quad x = -\frac{72}{71}$$

- Sustituir Z, X

$$\begin{aligned} &= 5\left(-\frac{72}{71}\right) + 2y - 3\left(\frac{48}{71}\right) = 22 \\ &= \frac{1033}{71} = y \end{aligned}$$

$$= (x, y, z) = \left(-\frac{72}{71}, \frac{1033}{71}, \frac{48}{71}\right)$$

S.  $A = \begin{pmatrix} 5 & 2 & 4 & 12 \\ -3 & 3 & 3 & 56 \\ 2 & -1 & -1 & 69 \end{pmatrix}$   $3 \times 3$

$A^T = \begin{pmatrix} 5 & -3 & 2 \\ 2 & 3 & -1 \\ 4 & 3 & -1 \\ 12 & 56 & 69 \end{pmatrix}$   $3 \times 3$