

Bloque 2. Álgebra  
Tema 5 Sistemas Lineales

Ejercicios propuestos

2.5-1 Resolver los siguientes sistemas, utilizando el método de eliminación de Gauss:

$$a) \left. \begin{array}{r} 2x + y - z = 5 \\ x - y + 2z = -3 \\ 3x - 2y + z = -2 \end{array} \right\}$$

$$b) \left. \begin{array}{r} x + 3y - 2z = 4 \\ 3x + 2y + z = 5 \\ 4x + 4y + 2z = 6 \end{array} \right\}$$

$$c) \left. \begin{array}{r} -x - 2y + z = -1 \\ 2x + 3y - z = 1 \\ 3x + 3y + 9z = 6 \end{array} \right\}$$

$$d) \left. \begin{array}{r} 3x + 5y + 2z = 1 \\ x - y - z = 0 \\ 2x + 3y + 4z = 2 \end{array} \right\}$$

$$e) \left. \begin{array}{r} 2x + 4y + 5z = 1 \\ x + 3y + 3z = -1 \\ 3x + 3y + 2z = 2 \end{array} \right\}$$

$$f) \left. \begin{array}{r} x + y + z = 2 \\ x + 2y - 3z = 8 \\ 2x - 2y + 2z = -4 \end{array} \right\}$$

$$g) \left. \begin{array}{r} 3x + 5y + 2z = 10 \\ x - y - z = -1 \\ 2x + 3y + 4z = 9 \end{array} \right\}$$

$$h) \left. \begin{array}{r} x + y + z = 13 \\ -99x + 99z = -198 \\ -9y + 9z = 36 \end{array} \right\}$$

$$i) \left. \begin{array}{l} 2x - 5y + 3z = 1 \\ x + 3y - z = 0 \\ 3x - 2y + 2z = 1 \end{array} \right\}$$

$$j) \left. \begin{array}{l} 3x + 5y - 8z = 2 \\ 5x + 3y - 8z = 2 \\ -8x + 5y + 3z = 2 \end{array} \right\}$$

2.5-2 Estudiar y resolver, cuando sea posible, los siguientes sistemas:

$$a) \left. \begin{array}{l} 4x - 6y = -28 \\ 5x - 2y = -13 \end{array} \right\}$$

$$b) \left. \begin{array}{l} -2x - 4y = 2 \\ -8x - 16y = 1 \end{array} \right\}$$

$$c) \left. \begin{array}{l} 2x + 3y - z = 15 \\ 2x - y + z = -3 \\ x - y = 0 \end{array} \right\}$$

$$d) \left. \begin{array}{l} x - 2y + 3z = -3 \\ 2x + y = 2 \\ -x - 8y + 9z = 3 \end{array} \right\}$$

$$e) \left. \begin{array}{l} 2x - 5y + 12z = 9 \\ 4x - y - 2z = -2 \\ 2x + 4y + 10z = -11 \end{array} \right\}$$

$$f) \left. \begin{array}{l} x + y - z = 10 \\ x - y + z = 5 \end{array} \right\}$$

$$g) \left. \begin{array}{l} x - 4y = -5 \\ 2x + y = -1 \\ 2x - 8y = -10 \end{array} \right\}$$

$$h) \left. \begin{array}{l} x - 2y + z = 0 \\ x + y - 2z = -3 \\ -2x + 5y - z = 5 \\ 3x - 2y + z = 2 \end{array} \right\}$$

$$i) \left. \begin{array}{l} x - y + 2z + 3t = 1 \\ 2x + 3y - z + t = -3 \\ x + y + z + t = 0 \end{array} \right\}$$

$$j) \left. \begin{array}{l} -x + y - z = -1 \\ 5x + y + 2z = -3 \\ 4x + 2y + z = 0 \\ 3x + 3y = -1 \end{array} \right\}$$

2.5-3 Estudiar y resolver, cuando sea posible, los siguientes sistemas en función del valor de los parámetros:

$$a) \left. \begin{array}{l} ax + (a^2+1)y + az = a \\ x + ay + z = 0 \\ x + (a+1)y + a^2z = 2a-1 \end{array} \right\}$$

$$b) \left. \begin{array}{l} x + y + 2z = a \\ x - ay + z = a \\ x - y + z = a \end{array} \right\}$$

$$c) \left. \begin{array}{l} -3x + 2y + 3z = -2 \\ 2x + ay - 5z = -4 \\ x + y + 2z = 2 \end{array} \right\}$$

$$d) \left. \begin{array}{l} ax + y + z = a \\ x + ay + z = a \\ x + y + az = a \end{array} \right\}$$

$$e) \left. \begin{array}{l} x + y + z = a+2 \\ x - ay + z = 1 \\ ax + y + z = 4 \end{array} \right\}$$

$$f) \left. \begin{array}{l} x + y + (a+1)z = a^4 + 3a^3 \\ x + (a+1)y + z = a^3 + 3a^2 \\ (a+1)x + y + z = a^2 + 3a \end{array} \right\}$$

$$g) \left. \begin{array}{l} ax + a^2y + a^3z = a \\ x + ay + a^2z = a^2 \\ x + y + az = a^3 \\ x + y + z = a^4 \end{array} \right\}$$

$$h) \left. \begin{array}{l} (2a+3)x + ay = 1 \\ -x + ay = 1 \end{array} \right\}$$

$$i) \left. \begin{array}{l} x + 2z = 3 \\ 3x + y + z = -1 \\ 2y - z = -2 \\ x - y + az = -5 \end{array} \right\}$$

$$j) \left. \begin{array}{l} x + y + z = 1 \\ 2x - y - z = 2 \\ ax + y + 3z = 4 \\ ax + y - 7z = 3 \end{array} \right\}$$