

Examen de Matemáticas 1º de Bachillerato CS

Noviembre 2019

Problema 1 Discutir y resolver por el método de Gauss los siguientes sistemas:

$$\left\{ \begin{array}{l} x - 3y + z = -7 \\ 2x + y - 2z = 0 \\ -x + 2y + z = 5 \end{array} \right. ; \left\{ \begin{array}{l} x - y + 2z = 1 \\ 3x + y - z = 2 \\ x + 3y - 5z = 0 \end{array} \right.$$

Solución:

$$\left\{ \begin{array}{l} x - 3y + z = -7 \\ 2x + y - 2z = 0 \\ -x + 2y + z = 5 \end{array} \right. \text{ Sistema Compatible Determinado} \implies \left\{ \begin{array}{l} x = -1 \\ y = 2 \\ z = 0 \end{array} \right.$$

$$\left\{ \begin{array}{l} x - y + 2z = 1 \\ 3x + y - z = 2 \\ x + 3y - 5z = 0 \end{array} \right. \text{ Sistema Compatible Indeterminado} \implies \left\{ \begin{array}{l} x = \frac{3}{4} - \frac{1}{4}\lambda \\ y = -\frac{1}{4} + \frac{7}{4}\lambda \\ z = \lambda \end{array} \right.$$

Problema 2 Resolver los siguientes sistemas:

$$\left\{ \begin{array}{l} x^2 + 3y^2 = 7 \\ 3x - y = 7 \end{array} \right. ; \left\{ \begin{array}{l} 3x \cdot y = -30 \\ x - 5y = -27 \end{array} \right.$$

Solución:

$$\left\{ \begin{array}{l} x^2 + 3y^2 = 7 \\ 3x - y = 7 \end{array} \right. \implies \left\{ \begin{array}{l} x = 2, y = -1 \\ x = 5/2, y = 1/2 \end{array} \right.$$
$$\left\{ \begin{array}{l} 3x \cdot y = -30 \\ x - 5y = -27 \end{array} \right. \implies \left\{ \begin{array}{l} x = -2, y = 5 \\ x = -25, y = 2/5 \end{array} \right.$$

Problema 3 Resolver las inecuaciones siguientes:

1. $\frac{2x-3}{36} - \frac{x-5}{12} \geq 1 - \frac{x-7}{6}$

2. $\frac{x^2-8x+15}{x^2-9x+14} \geq 0$

3. $\frac{x^2-4x-21}{x^2+4x-5} \leq 0$

Solución:

1. $\frac{2x-3}{36} - \frac{x-5}{12} \geq 1 - \frac{x-7}{6} \implies \left[\frac{66}{5}, \infty \right)$

$$2. \frac{x^2 - 8x + 15}{x^2 - 9x + 14} \geq 0 \implies (-\infty, 2) \cup [3, 5] \cup (7, \infty)$$

$$3. \frac{x^2 - 4x - 21}{x^2 + 4x - 5} \leq 0 \implies (-5, -3] \cup (1, 7]$$