

Examen de Matemáticas 1º de Bachillerato CS

Noviembre 2017

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

$$\left\{ \begin{array}{lcl} x+ & 2y- & z = 3 \\ 2x- & y+ & z = -4 \\ 3x+ & y- & 2z = -1 \end{array} \right. ; \quad \left\{ \begin{array}{lcl} x+ & y- & 2z = 2 \\ 2x+ & y+ & z = 3 \\ x- & y+ & 8z = 0 \end{array} \right.$$

Solución:

$$\left\{ \begin{array}{lcl} x+ & 2y- & z = 3 \\ 2x- & y+ & z = -4 \\ 3x+ & y- & 2z = -1 \end{array} \right. \text{ Sistema Compatible Determinado} \implies \left\{ \begin{array}{l} x = -1 \\ y = 2 \\ z = 0 \end{array} \right.$$
$$\left\{ \begin{array}{lcl} x+ & y- & 2z = 2 \\ 2x+ & y+ & z = 3 \\ x- & y+ & 8z = 0 \end{array} \right. \text{ Sistema Compatible Indeterminado} \implies \left\{ \begin{array}{l} x = 1 - 3\lambda \\ y = 1 + 5\lambda \\ z = \lambda \end{array} \right.$$

Problema 2 Resolver los siguientes sistemas:

$$\left\{ \begin{array}{l} 2x^2 - y^2 = -7 \\ x + 2y = 7 \end{array} \right. ; \quad \left\{ \begin{array}{l} 2x \cdot y = 6 \\ x - 3y = -8 \end{array} \right.$$

Solución:

$$\left\{ \begin{array}{l} 2x^2 - y^2 = -7 \\ x + 2y = 7 \end{array} \right. \implies \left\{ \begin{array}{l} x = 1, \ y = 3 \\ x = -3, \ y = 5 \end{array} \right.$$
$$\left\{ \begin{array}{l} 2x \cdot y = 6 \\ x - 3y = -8 \end{array} \right. \implies \left\{ \begin{array}{l} x = 1, \ y = 3 \\ x = -9, \ y = -1/3 \end{array} \right.$$

Problema 3 Resolver las inecuaciones siguientes:

1. $\frac{3x+1}{12} - \frac{x-1}{4} \geq 1 - \frac{x+5}{6}$
2. $\frac{x^2 - 5x - 14}{x^2 + x - 6} \geq 0$
3. $\frac{x^2 + 4x - 5}{x^2 - x - 12} \leq 0$

Solución:

1. $\frac{3x+1}{12} - \frac{x-1}{4} \geq 1 - \frac{x+5}{6} \implies [-1, \infty)$

$$2. \frac{x^2 - 5x - 14}{x^2 + x - 6} \geq 0 \implies (-\infty, -3) \cup [-2, 2) \cup [7, \infty)$$

$$3. \frac{x^2 + 4x - 5}{x^2 - x - 12} \leq 0 \implies [-5, -3) \cup [1, 4)$$