Examen de Matemáticas 1º de Bachillerato CS

Noviembre 2022

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

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

Solución:

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

$$\left\{\begin{array}{rrrr} x- & y+ & 2z= & 3 \\ 2x+ & y- & 2z= & 4 \\ x- & 4y+ & 8z= & 5 \end{array}\right. \text{ Sistema Compatible Indeterminado} \Longrightarrow \left\{\begin{array}{l} x=\dfrac{7}{3} \\ y=-\dfrac{2}{3}+2\lambda \\ z=\lambda \end{array}\right.$$

Problema 2 Resolver los siguientes sistemas:

$$\left\{\begin{array}{c} x^2-5y^2=-1 \\ x+y=1 \end{array}\right. ; \quad \left\{\begin{array}{c} xy=4 \\ 2x-y=2 \end{array}\right.$$

Solución:

$$\left\{\begin{array}{c} x^2-5y^2=-1 \\ x+y=1 \end{array}\right. \Longrightarrow \left\{\begin{array}{c} x=2,\ y=-1 \\ x=1/2,\ y=1/2 \end{array}\right.$$

$$\left\{\begin{array}{c} xy=4 \\ 2x-y=2 \end{array}\right. \Longrightarrow \left\{\begin{array}{c} x=-1,\ y=-4 \\ x=2,\ y=2 \end{array}\right.$$

Problema 3 Resolver las inecuaciones siguientes:

a) $\dfrac{2x-7}{8}-\dfrac{x-1}{12}\geq 1-\dfrac{x+1}{6}$

b) $\dfrac{x^2+4x-21}{x^2+3x-10}\geq 0$

c) $\dfrac{x^2+x-30}{x^2+x-2}\leq 0$

Solución:

a) $\dfrac{2x-7}{8}-\dfrac{x-1}{12}\geq 1-\dfrac{x+1}{6} \Longrightarrow \left[\dfrac{39}{8},\infty\right)$

b) $\dfrac{x^2+4x-21}{x^2+3x-10} \geq 0 \Longrightarrow (-\infty,-7] \cup (-5,2) \cup [3,\infty)$

c) $\dfrac{x^2+x-30}{x^2+x-2} \leq 0 \Longrightarrow [-6,-2) \cup (1,5]$