Examen de Matemáticas 1º de Bachillerato

Octubre 2018

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

$$\left\{\begin{array}{rrrcl} x+ & 2y+ & 2z= & 1 \\ -2x+ & y+ & 3z= & 2 \\ 2x- & y+ & z= & 6 \end{array}\right. ; \quad \left\{\begin{array}{rrrcl} x+ & y- & z= & 3 \\ 2x- & 2y+ & z= & 1 \\ x+ & 5y- & 4z= & 2 \end{array}\right.$$

Solución:

$$\left\{\begin{array}{rrrcl} x+ & 2y+ & 2z= & 1 \\ -2x+ & y+ & 3z= & 2 \\ 2x- & y+ & z= & 6 \end{array}\right. \text{ Sistema Compatible Determinado} \Longrightarrow \left\{\begin{array}{l} x=1 \\ y=-2 \\ z=2 \end{array}\right.$$

$$\left\{\begin{array}{rrrcl} x+ & y- & z= & 3 \\ 2x- & 2y+ & z= & 1 \\ x+ & 5y- & 4z= & 2 \end{array}\right. \text{ Sistema Incompatible}$$

Problema 2 Resolver los siguientes sistemas:

$$\left\{\begin{array}{c} 3x^2-y^2=2 \\ 5x+y=4 \end{array}\right. ; \quad \left\{\begin{array}{c} 3x\cdot y=-18 \\ 2x-y=7 \end{array}\right.$$

Solución:

$$\left\{\begin{array}{c} 3x^2-y^2=2 \\ 5x+y=4 \end{array}\right. \Longrightarrow \left\{\begin{array}{c} x=1,\ y=-1 \\ x=-9/11,\ y=-1/11 \end{array}\right.$$

$$\left\{\begin{array}{c} 3x\cdot y=-18 \\ 2x-y=7 \end{array}\right. \Longrightarrow \left\{\begin{array}{c} x=2,\ y=-3 \\ x=3/2,\ y=-4 \end{array}\right.$$

Problema 3 Resolver las inecuaciones siguientes:

1. $\dfrac{5x-1}{18}-\dfrac{x+2}{3}\leq 1-\dfrac{x+1}{6}$
2. $\dfrac{x^2+2x-15}{x^2-3x+2}\geq 0$
3. $\dfrac{x^2-6x-7}{x^2-2x-8}\leq 0$

Solución:

1. $\dfrac{5x-1}{18} - \dfrac{x+2}{3} \leq 1 - \dfrac{x+1}{6} \Longrightarrow (-\infty, -14]$

2. $\dfrac{x^2+2x-15}{x^2-3x+2} \geq 0 \Longrightarrow (-\infty, -5] \cup (1, 2) \cup [3, \infty)$

3. $\dfrac{x^2-6x-7}{x^2-2x-8} \leq 0 \Longrightarrow (-2, -1] \cup (4, 7]$