

Examen de Matemáticas 1º de Bachillerato
Octubre 2007

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

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

Solución:

$$\left\{ \begin{array}{l} x- \quad y- \quad z = 0 \\ 2x+ \quad y- \quad z = 2 \\ x- \quad 2y+ \quad z = 3 \end{array} \right. \text{ Sistema Compatible Determinado} \implies \left\{ \begin{array}{l} x = 12/7 \\ y = 1/7 \\ z = 11/7 \end{array} \right.$$

$$\left\{ \begin{array}{l} x+ \quad y+ \quad z = 2 \\ 3x- \quad y+ \quad 2z = 3 \\ 2x- \quad 2y+ \quad z = 7 \end{array} \right. \text{ Sistema Incompatible}$$

Problema 2 Resolver las ecuaciones:

a) $\log(x+1) - 1 = \log(x^2 - 1)$

b) $5^{2x+1} - 5^x - 2 = 0$

c) $\frac{x}{x^2 + x - 2} - \frac{1}{x + 2} = 1 - \frac{1}{x - 1}$

d) $\frac{x^2 + 6x - 7}{x^2 + 2x - 15} \leq 0$

e) $x - \sqrt{x^2 + 15} = -3$

f) $\sqrt{x - 2} + \sqrt{x + 3} = 5$

Solución:

a) $\log(x+1) - 1 = \log(x^2 - 1) \implies \log \frac{x+1}{10} = \log(x^2 - 1) \implies$

$$x = 11/10 = 1, 1.$$

b) $5^{2x+1} - 5^x - 2 = 0 \implies 5t^2 - t - 2 = 0 \implies t = 5^x = -0,5403124237$
No Vale y $t = 5^x = 0,7403124237 \implies x = -0,1868248444.$

c) $\frac{x}{x^2 + x - 2} - \frac{1}{x + 2} = 1 - \frac{1}{x - 1} \implies x = \pm\sqrt{5}$

d) $\frac{x^2 + 6x - 7}{x^2 + 2x - 15} \leq 0 \implies [-7, -5) \cup (1, 3)$

e) $x - \sqrt{x^2 + 15} = -3 \implies x = 1$

f) $\sqrt{x-2} + \sqrt{x+3} = 5 \implies x = 6$