

Examen de Matemáticas 1º de Bachillerato CN

Octubre 2012

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

$$\left\{ \begin{array}{l} x + 2y - z = 1 \\ 2x - y + 3z = 2 \\ x + 7y - 6z = 1 \end{array} \right. ; \quad \left\{ \begin{array}{l} x + y - 3z = 1 \\ 2x - y - z = -2 \\ 3x + y + 2z = 8 \end{array} \right.$$

Solución:

$$\left\{ \begin{array}{l} x + 2y - z = 1 \\ 2x - y + 3z = 2 \\ x + 7y - 6z = 1 \end{array} \right. \text{ Sistema Compatible Indeterminado } \Rightarrow \left\{ \begin{array}{l} x = 1 - \lambda \\ y = \lambda \\ z = \lambda \end{array} \right.$$

$$\left\{ \begin{array}{l} x + y - 3z = 1 \\ 2x - y - z = -2 \\ 3x + y + 2z = 8 \end{array} \right. \text{ Sistema Compatible Determinado } \Rightarrow \left\{ \begin{array}{l} x = 1 \\ y = 3 \\ z = 1 \end{array} \right.$$

Problema 2 Resolver las ecuaciones:

1. $\log(8 - x) - \log(x + 2) = 1$
2. $\log(3 - x^2) - \log x = 1 + \log(x - 2)$
3. $2\log(2 - x) - 1 = \log x$
4. $3^{x^2+2} \cdot 9^{x-3} = 27^{x+1}$
5. $4^{x-1} + 2^{x+1} - 5 = 0$

Solución:

$$1. \log(8 - x) - \log(x + 2) = 1 \Rightarrow \log \frac{8 - x}{x + 2} = \log 10 \Rightarrow$$

$$11x = -12 \Rightarrow x = -\frac{12}{11}.$$

$$2. \log(3 - x^2) - \log x = 1 + \log(x - 2) \Rightarrow \log \frac{3 - x^2}{x} = \log 10(x - 2) \Rightarrow 11x^2 - 20x - 3 = 0 \Rightarrow x = 1,957505690 \text{ (no vale)}, x = -0,1393238722 \text{ (no vale)}.$$

$$3. 2\log(2 - x) - 1 = \log x \Rightarrow x^2 - 14x + 4 = 0 \Rightarrow x = 0,292, x = 13,708 \text{ (no vale)}.$$

4.

$$3^{x^2+2} \cdot 9^{x-3} = 27^{x+1} \implies x^2 - x - 7 = 0 \implies \begin{cases} x = 3,192582403 \\ x = -2,192582403 \end{cases}$$

5.

$$4^{x-1} + 2^{x+1} - 5 = 0 \implies t^2 + 8t - 20 = 0 \implies \begin{cases} t = 2 \implies x = 1 \\ t = -10 \text{ no vale} \end{cases}$$