

Examen de Matemáticas 1º de Bachillerato CN

Octubre 2015

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

$$\begin{cases} x- & y+ & z = & 2 \\ 2x+ & 3y+ & 2z = & 5 \\ x+ & 9y+ & z = & 4 \end{cases} ; \quad \begin{cases} x- & 2y+ & 2z = & 0 \\ 2x+ & y+ & 2z = & 8 \\ 3x- & y+ & z = & 5 \end{cases}$$

Solución:

$$\begin{cases} x- & y+ & z = & 2 \\ 2x+ & 3y+ & 2z = & 5 \\ x+ & 9y+ & z = & 4 \end{cases} \text{ Sistema Compatible Indeterminado} \implies \begin{cases} x = 11/5 - \lambda \\ y = 1/5 \\ z = \lambda \end{cases}$$

$$\begin{cases} x- & 2y+ & 2z = & 0 \\ 2x+ & y+ & 2z = & 8 \\ 3x- & y+ & z = & 5 \end{cases} \text{ Sistema Compatible Determinado} \implies \begin{cases} x = 2 \\ y = 2 \\ z = 1 \end{cases}$$

Problema 2 Resolver las ecuaciones:

1. $\log(4-x) - \log(x+5) = 1$
2. $\log(7-x^2) - \log x = 1 + \log(x-5)$
3. $2\log(3-x) - 1 = \log(x-3)$
4. $3^{x^2-1} \cdot 9^{3x-2} = 27^{x+2}$
5. $7^{2x-1} + 7^{x-1} - 2 = 0$

Solución:

$$1. \log(4-x) - \log(x+5) = 1 \implies \log \frac{4-x}{x+5} = \log 10 \implies$$

$$11x = -46 \implies x = -\frac{46}{11}.$$

$$2. \log(7-x^2) - \log x = 1 + \log(x-5) \implies \log \frac{7-x^2}{x} = \log 10(x-5) \implies \\ 11x^2 - 50x - 7 = 0 \implies x = 4, 68, \text{ (no vale)} \quad x = -0, 14 \text{ (no vale)}.$$

$$3. 2\log(3-x) - 1 = \log(x-3) \implies x^2 - 16x + 39 = 0 \implies x = 13, \text{ (no vale)} \quad x = 3, \text{ (no vale)}.$$

4.

$$3^{x^2-1} \cdot 9^{3x-2} = 27^{x+2} \implies x^2 + 3x - 11 = 0 \implies \begin{cases} x = 2, 14 \\ x = -5, 14 \end{cases}$$

5.

$$7^{2x-1} + 7^{x-1} - 2 = 0 \implies t^2 + t - 14 = 0 \implies \begin{cases} t = 3, 27 \implies x = 0, 61 \\ t = -4, 27 \text{ no vale} \end{cases}$$