

Examen de Matemáticas 1º de Bachillerato CN

Octubre 2018

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

$$\begin{cases} x- & 2y+ & z = & 5 \\ 2x+ & y- & 2z = & 0 \\ -x+ & 3y+ & z = & -7 \end{cases} ; \quad \begin{cases} x+ & y- & z = & 2 \\ 3x- & 2y+ & z = & 1 \\ -3x+ & 7y- & 5z = & 4 \end{cases}$$

Solución:

$$\begin{cases} x- & 2y+ & z = & 5 \\ 2x+ & y- & 2z = & 0 \\ -x+ & 3y+ & z = & -7 \end{cases} \text{ Sistema Compatible Determinado} \implies \begin{cases} x = 1 \\ y = -2 \\ z = 0 \end{cases}$$

$$\begin{cases} x+ & y- & z = & 2 \\ 3x- & 2y+ & z = & 1 \\ -3x+ & 7y- & 5z = & 4 \end{cases} \text{ Sistema Compatible Indeterminado} \implies \begin{cases} x = 1 + 1/5\lambda \\ y = 1 + 4/5\lambda \\ z = \lambda \end{cases}$$

Problema 2 Resolver las ecuaciones:

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

Solución:

$$1. \log(7-x) - \log(x-2) = 2 \implies \log \frac{7-x}{x-2} = \log 100 \implies$$

$$11x = 27 \implies x = \frac{27}{11}.$$

$$2. \log(3-x^2) - \log(x-5) = 1 + \log x \implies \log \frac{3-x^2}{x-5} = \log(10x) \implies \\ 11x^2 - 50x - 3 = 0 \implies x = 4, 6, (\text{no vale}) \quad x = -0,06 (\text{no vale}).$$

$$3. 2\log(1-x) - 2 = \log(x+1) \implies x^2 - 102x - 99 = 0 \implies x = \\ -0,961, \quad x = 102,96, (\text{no vale}).$$

4.

$$3^{x+5} \cdot 9^{x^2-1} = 27^{2x+7} \implies 2x^2 - 5x - 18 = 0 \implies \begin{cases} x = -2 \\ x = 9/2 \end{cases}$$

5.

$$5^{2x-1}+5^{x+1}-3=0 \implies t^2+25t-15=0 \implies \begin{cases} t=0,59 \implies x=-0,33 \\ t=-25,59 \text{ no vale} \end{cases}$$