

**Examen de Matemáticas 1º de Bachillerato CN**  
**Octubre 2019**

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

$$\begin{cases} x- & 2y+ & z = & -6 \\ -x+ & y+ & 2z = & 1 \\ 2x- & y- & z = & -3 \end{cases} ; \begin{cases} x+ & y+ & 2z = & -1 \\ 2x+ & 3y- & z = & 0 \\ 5x+ & 6y+ & 5z = & -3 \end{cases}$$

**Solución:**

$$\begin{cases} x- & 2y+ & z = & -6 \\ -x+ & y+ & 2z = & 1 \\ 2x- & y- & z = & -3 \end{cases} \text{ Sistema Compatible Determinado} \implies \begin{cases} x = -1 \\ y = 2 \\ z = -1 \end{cases}$$

$$\begin{cases} x+ & y+ & 2z = & -1 \\ 2x+ & 3y- & z = & 0 \\ 5x+ & 6y+ & 5z = & -3 \end{cases} \text{ Sistema Compatible Indeterminado} \implies \begin{cases} x = -3 - 7\lambda \\ y = 2 + 5\lambda \\ z = \lambda \end{cases}$$

**Problema 2** Resolver las ecuaciones:

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

**Solución:**

$$1. \log(9 - x) - \log(x - 1) = 2 \implies \log \frac{9 - x}{x - 1} = \log 100 \implies$$

$$101x = 109 \implies x = \frac{109}{101}.$$

$$2. \log(4 - x^2) - \log(x - 7) = 1 + \log(2x) \implies \log \frac{4 - x^2}{x - 7} = \log(20x) \implies$$
$$21x^2 - 140x - 4 = 0 \implies x = 6, 7, \text{ (no vale)} \quad x = -0,028 \text{ (no vale)}.$$

$$3. 2\log(3 - x) - 2 = \log(x + 5) \implies x^2 - 106x - 491 = 0 \implies x =$$
$$110, 45, \text{ (no vale)}, \quad x = -4, 45.$$

4.

$$3^{2x-5} \cdot 9^{x^2+2} = 27^{2x+1} \implies 2x^2 - 4x - 4 = 0 \implies \begin{cases} x = -0,732 \\ x = 2,732 \end{cases}$$

5.

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