

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

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

**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.

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

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