

Examen de Matemáticas 1º de Bachillerato

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

$$\begin{cases} x+ & 3y- & z = & 0 \\ 2x+ & y+ & 4z = & 1 \\ & 5y- & 6z = & -1 \end{cases} ; \begin{cases} x+ & y+ & 3z = & 2 \\ 2x- & y+ & 2z = & -1 \\ 3x+ & 2y+ & 7z = & 5 \end{cases}$$

Solución:

$$\begin{cases} x+ & 3y- & z = & 0 \\ 2x+ & y+ & 4z = & 1 \\ & 5y- & 6z = & -1 \end{cases} \text{ Sistema Compatible Indeterminado} \implies \begin{cases} x = 3/5 - 13/5\lambda \\ y = -1/5 + 6/5\lambda \\ z = \lambda \end{cases}$$
$$\begin{cases} x+ & y+ & 3z = & 2 \\ 2x- & y+ & 2z = & -1 \\ 3x+ & 2y+ & 7z = & 5 \end{cases} \text{ Sistema Compatible Determinado} \implies \begin{cases} x = 2 \\ y = 3 \\ z = -1 \end{cases}$$

Problema 2 Resolver las ecuaciones:

- $\log(5-x) - \log(x+1) = 2$
- $\log(5-x^2) - \log x = 1 + \log(x-1)$
- $2 \log(3-x) - 1 = \log x$
- $2^{x^2-1} \cdot 4^{x-5} = 32^{x+1}$
- $9^{x-1} - 3^{x+1} - 3 = 0$

Solución:

1. $\log(5-x) - \log(x+1) = 2 \implies \log \frac{5-x}{x+1} = \log 100 \implies$

$$101x = -95 \implies x = -\frac{95}{101}.$$

2. $\log(5-x^2) - \log x = 1 + \log(x-1) \implies \log \frac{5-x^2}{x} = \log 10(x-1) \implies$
 $11x^2 - 10x - 5 = 0 \implies x = 1,267661082, x = -0,3585701736(\text{no vale}).$

3. $2 \log(3-x) - 1 = \log x \implies x^2 - 16x + 9 = 0 \implies x = 0,584, x = 15,416(\text{no vale}).$

4.

$$2^{x^2-1} \cdot 4^{x-5} = 32^{x+1} \implies x^2 - 3x - 16 = 0 \implies \begin{cases} x = 5,772001872 \\ x = -2,772001872 \end{cases}$$

5.

$$9^{x-1} - 3^{x+1} - 3 = 0 \implies t^2 - 27t - 27 = 0 \implies \begin{cases} t = 27,96547614 \implies x = 3,031980243 \\ t = -0,9654761414 \text{ no vale} \end{cases}$$