

Examen de Matemáticas 1º de Bachillerato

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

$$\begin{cases} x+ & y+ & z = & 4 \\ 2x+ & y- & z = & 3 \\ x+ & 2y+ & 4z = & 9 \end{cases} ; \quad \begin{cases} x+ & y+ & 2z = & 7 \\ 2x- & y+ & z = & 5 \\ x+ & y- & z = & 1 \end{cases}$$

Solución:

$$\begin{cases} x+ & y+ & z = & 4 \\ 2x+ & y- & z = & 3 \\ x+ & 2y+ & 4z = & 9 \end{cases} \text{ Sistema Compatible Indeterminado} \implies \begin{cases} x = -1 + 2\lambda \\ y = 5 - 3\lambda \\ z = \lambda \end{cases}$$
$$\begin{cases} x+ & y+ & 2z = & 7 \\ 2x- & y+ & z = & 5 \\ x+ & y- & z = & 1 \end{cases} \text{ Sistema Compatible Determinado} \implies \begin{cases} x = 2 \\ y = 1 \\ z = 2 \end{cases}$$

Problema 2 Resolver las ecuaciones:

1. $\log(6-x) - \log(x+1) = 1$
2. $\log(2-x^2) - \log x = 1 + \log(x-1)$
3. $2\log(1-x) - 1 = \log x$
4. $2^{x^2+2} \cdot 4^{x-3} = 8^{x+1}$
5. $4^{x-1} - 2^{x+1} - 3 = 0$

Solución:

$$1. \log(6-x) - \log(x+1) = 1 \implies \log \frac{6-x}{x+1} = \log 10 \implies$$

$$11x = -4 \implies x = -\frac{4}{11}.$$

$$2. \log(2-x^2) - \log x = 1 + \log(x-1) \implies \log \frac{2-x^2}{x} = \log 10(x-1) \implies$$
$$11x^2 - 10x - 2 = 0 \implies x = 1,077786781, \quad x = -0,1686958727(\text{no vale}).$$

$$3. 2\log(1-x) - 1 = \log x \implies x^2 - 12x + 1 = 0 \implies x = 0,084, \quad x = 11,916(\text{no vale}).$$

4.

$$2^{x^2+2} \cdot 4^{x-3} = 8^{x+1} \implies x^2 - x - 7 = 0 \implies \begin{cases} x = 3,192582403 \\ x = -2,192582403 \end{cases}$$

5.

$$4^{x-1}-2^{x+1}-3=0 \implies t^2-8t-12=0 \implies \begin{cases} t=9,291502622 \implies x=3,215911928 \\ t=-1,291502622 \text{ no vale} \end{cases}$$