Examen de Matemáticas 1º de Bachillerato CN

Octubre 2020

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

$$\left\{\begin{array}{rrrr} x- & 3y- & z= & 5 \\ -x+ & y+ & 3z= & 3 \\ 2x- & 3y+ & z= & 10 \end{array}\right. ; \quad \left\{\begin{array}{rrrr} x+ & 2y+ & z= & 3 \\ 2x- & y+ & 2z= & 2 \\ x+ & 7y+ & z= & 7 \end{array}\right.$$

Solución:

$$\left\{\begin{array}{rrrr} x- & 3y- & z= & 5 \\ -x+ & y+ & 3z= & 3 \\ 2x- & 3y+ & z= & 10 \end{array}\right. \text{Sistema Compatible Determinado} \Longrightarrow \left\{\begin{array}{l} x=1 \\ y=-2 \\ z=2 \end{array}\right.$$

$$\left\{\begin{array}{rrrr} x+ & 2y+ & z= & 3 \\ 2x- & y+ & 2z= & 2 \\ x+ & 7y+ & z= & 7 \end{array}\right. \text{Sistema Compatible Indeterminado} \Longrightarrow \left\{\begin{array}{l} x=\frac{7}{5}-\lambda \\ y=\frac{4}{5} \\ z=\lambda \end{array}\right.$$

Problema 2 Resolver las ecuaciones:

1. $\log(3-x)-\log(x-2)=2$
2. $\log(9-x^2)-\log(x-5)=1+\log(2x)$
3. $2\log(4-x)-2=\log(x+7)$
4. $2^{2x-5}\cdot 4^{x^2+2}=16^{2x+1}$
5. $2^{2x-1}+2^{x-1}-2=0$

Solución:

1. $\log(3-x)-\log(x-2)=2 \Longrightarrow \log\dfrac{3-x}{x-2}=\log 100 \Longrightarrow$

   $101x=203 \Longrightarrow x=\dfrac{203}{101}$.

2. $\log(9-x^2)-\log(x-5)=1+\log(2x) \Longrightarrow \log\dfrac{9-x^2}{x-5}=\log(20x) \Longrightarrow$ $21x^2-100x-9=0 \Longrightarrow x=4,8503,\quad x=-0,088$(no vale).

3. $2\log(4-x)-2=\log(x+7) \Longrightarrow x^2-108x-884=0 \Longrightarrow x=115,644$, (no vale), $\quad x=-7,644$.

4.

$$2^{2x-5}\cdot 4^{x^2+2}=16^{2x+1} \Longrightarrow 2x^2-6x-5=0 \Longrightarrow \left\{\begin{array}{l} x=-0,679 \\ x=3,679 \end{array}\right.$$

5.

$$2^{2x-1}+2^{x-1}-2=0 \Longrightarrow t^2+t-4=0 \Longrightarrow \begin{cases} t=1,562 \Longrightarrow x=0,643 \\ t=-2,562 \ \text{ no vale} \end{cases}$$