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

$$\left\{\begin{array}{rrrr} x+ & 3y- & z= & 0 \\ 2x+ & y+ & 4z= & 1 \\ & 5y- & 6z= & -1 \end{array}\right. ; \quad \left\{\begin{array}{rrrr} x+ & y+ & 3z= & 2 \\ 2x- & y+ & 2z= & -1 \\ 3x+ & 2y+ & 7z= & 5 \end{array}\right.$$

Solución:

$$\left\{\begin{array}{rrrr} x+ & 3y- & z= & 0 \\ 2x+ & y+ & 4z= & 1 \\ & 5y- & 6z= & -1 \end{array}\right. \text{ Sistema Compatible Indeterminado} \Longrightarrow \left\{\begin{array}{l} x = 3/5 - 13/5\lambda \\ y = -1/5 + 6/5\lambda \\ z = \lambda \end{array}\right.$$

$$\left\{\begin{array}{rrrr} x+ & y+ & 3z= & 2 \\ 2x- & y+ & 2z= & -1 \\ 3x+ & 2y+ & 7z= & 5 \end{array}\right. \text{ Sistema Compatible Determinado} \Longrightarrow \left\{\begin{array}{l} x = 2 \\ y = 3 \\ z = -1 \end{array}\right.$$

Problema 2 Resolver las ecuaciones:

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

Solución:

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

   $101x = -95 \Longrightarrow x = -\dfrac{95}{101}$.

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

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

4.

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

5.

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