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

$$\left\{\begin{array}{rrrcr} x+ & 2y- & z= & 1 \\ 2x- & y+ & 3z= & 2 \\ x+ & 7y- & 6z= & 1 \end{array}\right. ; \quad \left\{\begin{array}{rrrcr} x+ & y- & 3z= & 1 \\ 2x- & y- & z= & -2 \\ 3x+ & y+ & 2z= & 8 \end{array}\right.$$

Solución:

$$\left\{\begin{array}{rrrcr} x+ & 2y- & z= & 1 \\ 2x- & y+ & 3z= & 2 \\ x+ & 7y- & 6z= & 1 \end{array}\right. \text{ Sistema Compatible Indeterminado} \Longrightarrow \left\{\begin{array}{l} x = 1-\lambda \\ y = \lambda \\ z = \lambda \end{array}\right.$$

$$\left\{\begin{array}{rrrcr} x+ & y- & 3z= & 1 \\ 2x- & y- & z= & -2 \\ 3x+ & y+ & 2z= & 8 \end{array}\right. \text{ Sistema Compatible Determinado} \Longrightarrow \left\{\begin{array}{l} x = 1 \\ y = 3 \\ z = 1 \end{array}\right.$$

Problema 2 Resolver las ecuaciones:

1. $\log(8-x) - \log(x+2) = 1$
2. $\log(3-x^2) - \log x = 1 + \log(x-2)$
3. $2\log(2-x) - 1 = \log x$
4. $3^{x^2+2} \cdot 9^{x-3} = 27^{x+1}$
5. $4^{x-1} + 2^{x+1} - 5 = 0$

Solución:

1. $\log(8-x) - \log(x+2) = 1 \Longrightarrow \log\dfrac{8-x}{x+2} = \log 10 \Longrightarrow$

   $11x = -12 \Longrightarrow x = -\dfrac{12}{11}$.

2. $\log(3-x^2) - \log x = 1 + \log(x-2) \Longrightarrow \log\dfrac{3-x^2}{x} = \log 10(x-2) \Longrightarrow 11x^2 - 20x - 3 = 0 \Longrightarrow x = 1,957505690\,(novale),\ x = -0,1393238722$(no vale).

3. $2\log(2-x) - 1 = \log x \Longrightarrow x^2 - 14x + 4 = 0 \Longrightarrow x = 0,292,\ x = 13,708$(no vale).

4.

$$3^{x^2+2} \cdot 9^{x-3} = 27^{x+1} \Longrightarrow x^2 - x - 7 = 0 \Longrightarrow \begin{cases} x = 3,192582403 \\ x = -2,192582403 \end{cases}$$

5.

$$4^{x-1} + 2^{x+1} - 5 = 0 \Longrightarrow t^2 + 8t - 20 = 0 \Longrightarrow \begin{cases} t = 2 \Longrightarrow x = 1 \\ t = -10 \text{ no vale} \end{cases}$$