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

$$\left\{\begin{array}{rrrr} x+ & y- & z= & 3 \\ 2x- & y+ & 2z= & 2 \\ x- & 5y+ & 7z= & -5 \end{array}\right. ; \quad \left\{\begin{array}{rrrr} x+ & 2y- & z= & 2 \\ 2x- & y+ & 3z= & 9 \\ 3x+ & y- & z= & 2 \end{array}\right.$$

Solución:

$$\left\{\begin{array}{rrrr} x+ & y- & z= & 3 \\ 2x- & y+ & 2z= & 2 \\ x- & 5y+ & 7z= & -5 \end{array}\right. \text{ Sistema Compatible Indeterminado} \Longrightarrow \left\{\begin{array}{l} x = 5/3 - 1/3\lambda \\ y = 4/3 + 4/3\lambda \\ z = \lambda \end{array}\right.$$

$$\left\{\begin{array}{rrrr} x+ & 2y- & z= & 2 \\ 2x- & y+ & 3z= & 9 \\ 3x+ & y- & z= & 2 \end{array}\right. \text{ Sistema Compatible Determinado} \Longrightarrow \left\{\begin{array}{l} x = 1 \\ y = 2 \\ z = 3 \end{array}\right.$$

Problema 2 Resolver las ecuaciones:

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

Solución:

1. $\log(5-x) - \log(x+2) = 1 \Longrightarrow \log\dfrac{5-x}{x+2} = \log 10 \Longrightarrow$

   $11x = -15 \Longrightarrow x = -\dfrac{15}{11}$.

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

3. $2\log(2-x) - 1 = \log(x-1) \Longrightarrow x^2 - 14x + 14 = 0 \Longrightarrow x = 12,91607978$, (no vale) $x = 1,083920216$.

4.

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

5.

$$3^{2x-1}+3^{x-1}-2 = 0 \Longrightarrow t^2+t-6 = 0 \Longrightarrow \begin{cases} t = 2 \Longrightarrow x = 0,6309297535 \\ t = -3 \text{ no vale} \end{cases}$$