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

$$\left\{\begin{array}{rrrr} x+ & 2y+ & z= & 3 \\ 2x- & y+ & 2z= & 3 \\ x- & 8y+ & z= & -3 \end{array}\right. ; \quad \left\{\begin{array}{rrrr} x+ & y+ & z= & 2 \\ 2x- & y+ & 3z= & 9 \\ 2x+ & y+ & 2z= & 5 \end{array}\right.$$

Solución:

$$\left\{\begin{array}{rrrr} x+ & 2y+ & z= & 3 \\ 2x- & y+ & 2z= & 3 \\ x- & 8y+ & z= & -3 \end{array}\right. \text{ Sistema Compatible Indeterminado} \Longrightarrow \left\{\begin{array}{l} x = 9/5 - \lambda \\ y = 3/5 \\ z = \lambda \end{array}\right.$$

$$\left\{\begin{array}{rrrr} x+ & y+ & z= & 2 \\ 2x- & y+ & 3z= & 9 \\ 2x+ & y+ & 2z= & 5 \end{array}\right. \text{ Sistema Compatible Determinado} \Longrightarrow \left\{\begin{array}{l} x = 1 \\ y = -1 \\ z = 2 \end{array}\right.$$

Problema 2 Resolver las ecuaciones:

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

Solución:

1. $\log(3-x) - \log(x+3) = 1 \Longrightarrow \log \dfrac{3-x}{x+3} = \log 10 \Longrightarrow$
   $11x = -27 \Longrightarrow x = -\dfrac{27}{11}$.
2. $\log(4-x^2) - \log x = 1 + \log(x-1) \Longrightarrow \log \dfrac{4-x^2}{x} = \log 10(x-1) \Longrightarrow$
   $11x^2 - 10x - 4 = 0 \Longrightarrow x = 1,209693078,\ x = -0,3006021693$(no vale).
3. $2\log(3-x) - 1 = \log x \Longrightarrow x^2 - 16x + 9 = 0 \Longrightarrow x = 15,41619848$, (no vale) $x = 0,5838015129$ (no vale).

4.

$$3^{x^2-1} \cdot 9^{2x-3} = 27^{x+1} \Longrightarrow x^2 + x - 10 = 0 \Longrightarrow \begin{cases} x = 2,701562118 \\ x = -3,701562118 \end{cases}$$

5.

$$3^{2x-1}+3^{x+1}-1 = 0 \Longrightarrow t^2+9t-3 = 0 \Longrightarrow \begin{cases} t = 0,3218253804 \Longrightarrow x = -1,031980243 \\ t = -9,321825380 \text{ no vale} \end{cases}$$