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

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

Solución:

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

$$\left\{\begin{array}{rrrl} x+ & y+ & z &= 3 \\ x- & y+ & 2z &= 2 \\ 2x+ & y- & z &= 4 \end{array}\right. \text{ Sistema Compatible Determinado} \Longrightarrow \left\{\begin{array}{l} x = 13/7 \\ y = 5/7 \\ z = 3/7 \end{array}\right.$$

Problema 2 Resolver las ecuaciones:

a) $\log(x^2 + 14x + 14) - 1 = \log(x + 1)$

b) $3^{2x-1} + 3^{x+1} - 1 = 0$

c) $\dfrac{2}{x^2 - x - 6} - \dfrac{1}{x + 2} = 1 - \dfrac{2}{x - 3}$

d) $\dfrac{x^2 + 4x + 3}{x^2 - 5x + 6} \geq 0$

e) $\sqrt{x^2 + 8} - x = 2$

f) $\sqrt{x + 1} - \sqrt{x - 2} = 1$

Solución:

a)

$$\log(x^2 + 14x + 14) - 1 = \log(x + 1) \Longrightarrow$$

$$\log \frac{x^2 + 14x + 14}{10} = \log(x + 1) \Longrightarrow x = -2 \text{ No Vale}$$

b)

$$3^{2x-1} + 3^{x+1} - 1 = 0 \Longrightarrow \frac{t^2}{3} + 3t - 1 = 0 \Longrightarrow$$

$t = 3^x = -9{,}321825380$ No Vale y $t = 3^x = 0{,}3218253804 \Longrightarrow x = -1{,}031980243$

c)
$$\frac{2}{x^2-x-6}-\frac{1}{x+2}=1-\frac{2}{x-3}\Longrightarrow x=5,\quad x=-3$$

d)
$$\frac{x^2+4x+3}{x^2-5x+6}\geq 0\Longrightarrow\ (-\infty,-3]\cup[-1,2)\cup(3,\infty)$$

e) $\sqrt{x^2+8}-x=2\Longrightarrow\ x=1$

f) $\sqrt{x+1}-\sqrt{x-2}=1\Longrightarrow\ x=3$