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

$$\left\{\begin{array}{rrrl} x- & y- & z=0 & \\ 2x+ & y- & z=2 & ; \\ x- & 2y+ & z=3 & \end{array}\right. \quad \left\{\begin{array}{rrrl} x+ & y+ & z=2 & \\ 3x- & y+ & 2z=3 & \\ 2x- & 2y+ & z=7 & \end{array}\right.$$

Solución:

$$\left\{\begin{array}{rrrl} x- & y- & z=0 & \\ 2x+ & y- & z=2 & \text{Sistema Compatible Determinado} \\ x- & 2y+ & z=3 & \end{array}\right. \Longrightarrow \left\{\begin{array}{l} x=12/7 \\ y=1/7 \\ z=11/7 \end{array}\right.$$

$$\left\{\begin{array}{rrrl} x+ & y+ & z=2 & \\ 3x- & y+ & 2z=3 & \text{Sistema Incompatible} \\ 2x- & 2y+ & z=7 & \end{array}\right.$$

Problema 2 Resolver las ecuaciones:

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

b) $5^{2x+1}-5^x-2=0$

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

d) $\dfrac{x^2+6x-7}{x^2+2x-15}\leq 0$

e) $x-\sqrt{x^2+15}=-3$

f) $\sqrt{x-2}+\sqrt{x+3}=5$

Solución:

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

$x=11/10=1,1.$

b) $5^{2x+1}-5^x-2=0 \Longrightarrow 5t^2-t-2=0 \Longrightarrow t=5^x=-0,5403124237$
No Vale y $t=5^x=0,7403124237 \Longrightarrow x=-0,1868248444.$

c) $\dfrac{x}{x^2+x-2}-\dfrac{1}{x+2}=1-\dfrac{1}{x-1} \Longrightarrow x=\pm\sqrt{5}$

d) $\dfrac{x^2+6x-7}{x^2+2x-15}\leq 0 \Longrightarrow [-7,-5)\cup(1,3)$

e) $x - \sqrt{x^2 + 15} = -3 \implies x = 1$

f) $\sqrt{x-2} + \sqrt{x+3} = 5 \implies x = 6$