1. Encuentre las soluciones de las siguientes ecuaciones lineales.

a) $x - 6 = 7$ $\Rightarrow x = 6 + 7 \Rightarrow x = 13$

b) $5x + 11 = 0$ $\Rightarrow -\frac{11}{5} = x$

c) $2x + 6 = 3x + 5$

d) $-1 + 5x = -20.$

c) $2x + 6 = 3x + 5$

$6 - 5 = 3x - 2x$

$1 = 1x$

$1 = x$

d) $-1 + 5x = -20$

$5x = -19$

$x = -\frac{19}{5}$

2. Encuentre las raíces de las siguientes ecuaciones cuadráticas.

a) $(x - 2)^2 = 0$

b) $x^2 - 4x - 4 = 0.$

c) $2x^2 + 4x + 6 = 0.$

d) $x^2 - x - 1 = x + 1$

$(x-2) \cdot (x-2) = x^2 - 2x - 2x + 4$

$x^2 - 4x + 4$

$a = 1, \; b = -4, \; c = +4$

$\Delta = b^2 - 4ac$

$\Delta = (-4)^2 - 16$

$\Delta = 16 - 16$

$\Delta = 0$ 1 raiz

$x_0 = \frac{-b}{2a} \Rightarrow \frac{4}{2} = 2$

$x_0 = 2$

b) $x^2 - 4x - 4 = 0.$

$a = 1,\ b = -4,\ c = -4$

$\Delta = b^2 - 4ac$

$\Delta = 16 - 4.1.-4$

$\Delta = 16 + 16$

$\Delta = 32$

$x_1, x_2 = \frac{-b \pm \sqrt{\Delta}}{2.a}$

$= \frac{4 \pm \sqrt{32}}{2}$

$\sqrt{32} = 4.\sqrt{2}$

$= \frac{4 \pm 4.\sqrt{2}}{2}$

$\frac{4 + 4.\sqrt{2}}{2} = \frac{\cancel{4}^{2}}{\cancel{2}_{1}} + \frac{\cancel{4}^{2}.\sqrt{2}}{\cancel{2}} = 2 + 2.\sqrt{2}$

$= \frac{4 \pm 4.\sqrt{2}}{2}$

$2 - 2.\sqrt{2}$

c) $2x^2 + 4x + 6 = 0.$

$2(x^2 + 2x + 3) = 0$

$x^2 + 2x + 3 = 0$

$a = 1,\ b = 2,\ c = 3$

$\Delta = b^2 - 4ac$

$\Delta = 4 - 4.1.3$

$\Delta = 4 - 12$

$\Delta = -8$

$x_1, x_2 = \frac{-b \pm \sqrt{\Delta}}{2.a}$

$= \frac{-2 \pm \sqrt{8}\,i}{2}$

$\frac{-\cancel{2}^{1}}{\cancel{2}_{1}} + \frac{2\sqrt{2}\,i}{2} = -1 + \sqrt{2}\,i$

$-1 - \sqrt{2}\,i$

d) $x^2 - x - 1 = x + 1$

$x^2 - x - 1 - 1 - x = 0$

$x^2 - 2x - 2 = 0$

$a = 1,\ b = -2,\ c = -2$

$\Delta = b^2 - 4ac$

$4 - 4.1.-2$

$4 + 8$

$\Delta = 12$

$x_1, x_2 = \frac{+2 \pm \sqrt{12}}{2}$

$\sqrt{4.3} = 2.\sqrt{3}$

$\frac{1}{2} + \frac{2.\sqrt{3}}{2} = 1 + \sqrt{3}$

$1 - \sqrt{3}$

3. Resuelva las siguientes ecuaciones:

a) $(x-2)^2(x+\sqrt{3}) = 0$

b) $(x+1)^2 = 4(x+1) - 4$

c) $x^4 - 36x^2 = 0$

d) $\sqrt{4 - x^2} = -x$

e) $\left(x + \frac{1}{x}\right)^2 - \frac{1}{x} = x + 12$

a) $(x-2)^2 (x+\sqrt{3}) = 0$

$(x^2 - 4x + 4)(x + \sqrt{3}) = 0$

$(x-2) \cdot (x+\sqrt{3})$

$x^2 + \sqrt{3}x - 2x - 2.\sqrt{3}$

$x^2 + \sqrt{3} - 2x - 2.\sqrt{3}$