**Universidad Mariano Gálvez de Guatemala**

**Boca del Monte**

Ingeniería en Sistemas. Ciclo II, “c”

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**PRECALCULO**

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Formula Cuadratica

I

1. $z^2 = -(6z+7)$

$z^2 = -6z - 7$

$z^2 + 6z + 7 = 0$

$a = 1,\ b = 6,\ c = 7$

$$z = \frac{-6 \pm \sqrt{6^2 - 4 \times 1 \times 7}}{2 \times 1}$$

$$z = \frac{-6 \pm \sqrt{36 - 28}}{2}$$

$$z = \frac{-6 \pm \sqrt{8}}{2}$$

$$z = \frac{-6 \pm 2\sqrt{2}}{2}$$

$$z = \frac{-6 + 2\sqrt{2}}{2}$$

$$z = \frac{-6 - 2\sqrt{2}}{2}$$

$z = -3 + \sqrt{2}$

$z = -3 - \sqrt{2}$

$z_1 = -3 - \sqrt{2}$

$z_2 = -3 + \sqrt{2}$

2. $\frac{5}{w^2} - \frac{10}{w} + 2 = 0$

$\frac{5}{w^2} - \frac{10}{w} + 2 = 0, \quad w \neq 0$

$\frac{5 - 10w + 2w^2}{w^2} = 0$

$5 - 10w + 2w^2 = 0$

$a = 2, \quad b = -10, \quad c = 5$

$w = \frac{-(-10) \pm \sqrt{(-10)^2 - 4 \times 2 \times 5}}{2 \times 2}$

$w = \frac{10 \pm \sqrt{100 - 40}}{4}$

$w = \frac{10 \pm \sqrt{60}}{4}$

$w = \frac{10 \pm 2\sqrt{15}}{4}$

$w = \frac{10 + 2\sqrt{15}}{4}$ $\qquad w_1 = \frac{5 - \sqrt{15}}{2}$

$w = \frac{10 - 2\sqrt{15}}{4}$ $\qquad w_2 = \frac{5 + \sqrt{15}}{2}$

II

1. $(x-3)^2 = 17$

$x-3 = \pm\sqrt{17}$

$x-3 = -\sqrt{17}$

$x-3 = \sqrt{17}$

$x_1 = -\sqrt{17}+3$

$x_2 = \sqrt{17}+3$

2. $3\sqrt{2x-3} + 2\sqrt{7-x} = 11$

$3\sqrt{2x-3} = 11 - 2\sqrt{7-x}$

$9(2x-3) = 121 - 44\sqrt{7-x} + 4(7-x)$

$18x-27 = 121 - 14\sqrt{7-x} + 28 - 4x$

$18x-27 = 149 - 44\sqrt{7-x} + 28 - 4x$

$18x - 27 = 149 - 44\sqrt{7-x} - 4x$

$44\sqrt{7-x} = 149 - 4x - 18x + 27$

$44\sqrt{7-x} = 176 - 22x$

$2\sqrt{7-x} = 8 - x$

$4(7-x) = 64 - 16x + 2x^2$

$28 - 4x = 64 - 16x + x^2$

$28 - 4x - 64 + 16x - x^2 = 0$

$-36 + 12x - x^2 = 0$

$-(x^2-12x+3)=0$

$-(x-6)^2-0$

$(x-6)^2=0$

$x-6=0$

$x=6$

$3\sqrt{2\times6+3}+2\sqrt{7+6}=11$

$11=11$

$x=6$

3. $a(t+1)-6(t+1)=5t+a$

$at+a-6t-6=5t+a$

$at-6t-6=5t$

$3t-6=5t$

$3t-5t=6$

$-2t=6$

$t=-3$

4. $\frac{3+5x}{5}=\frac{4-x}{7}$

$7(3+5x)=5(4-x)$

$21+35x=20-5x$

$35x+5=20-21$

$40x=-1$

$x=-1/40$

5. $(3x-2)^2 = (x-5)(9x+4)$

$9x^2 - 12x + 4 = 9x^2 + 4x - 45x - 20$

$-12x + 4 = 4x - 45x - 20$

$-12x + 4 = -41x - 20$

$-12x + 41x = -20 - 4$

$29x = -24$

$x = -24/29$

6. $6x^2 + x - 12 = 0$

$6x^2 + 9x - 8x - 12 = 0$

$3x(2x+3) - 4(2x+3) = 0$

$(2x+3)(3x-4) = 0$

$2x + 3 = 0$

$3x - 4 = 0$

$x_1 = -3/2, \quad x_2 = 4/3$