

CONTROL DE ECUACIONES DE 2º GRADO

Resolver las siguientes ecuaciones:

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

$$(x-2)^2 = 3$$

$$x^2 - 4x + 4 = 3$$

$$x^2 - 4x + 4 - 3 = 0$$

$$x^2 - 4x + 1 = 0$$

$$\begin{aligned} x &= \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} = \frac{-(-4) \pm \sqrt{(-4)^2 - 4 \cdot 1 \cdot 1}}{2 \cdot 1} = \frac{4 \pm \sqrt{16 - 4}}{2} = \\ &= \frac{4 \pm \sqrt{12}}{2} = \frac{4 \pm \sqrt{2^2 \cdot 3}}{2} = \frac{4 \pm 2\sqrt{3}}{2} = \frac{\cancel{2}(2 \pm \sqrt{3})}{\cancel{2}} = 2 \pm \sqrt{3} = \begin{cases} x_1 = 2 + \sqrt{3} \\ x_2 = 2 - \sqrt{3} \end{cases} \end{aligned}$$

2.- $3x^2 + 2x - 4 = 1$

$$3x^2 + 2x - 4 = 1$$

$$3x^2 + 2x - 5 = 0$$

$$\begin{aligned} x &= \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} = \frac{-(2) \pm \sqrt{(2)^2 - 4 \cdot 3 \cdot (-5)}}{2 \cdot 3} = \frac{-2 \pm \sqrt{4 + 60}}{6} = \\ &= \frac{-2 \pm \sqrt{64}}{6} = \begin{cases} x_1 = \frac{-2 + \sqrt{64}}{6} \\ x_2 = \frac{-2 - \sqrt{64}}{6} \end{cases} \end{aligned}$$

3.- $\frac{(x+2)^2}{2} - 3 = \frac{1}{3}$

$$\frac{(x+2)^2}{2} - 3 = \frac{1}{3}$$

$$\frac{2(x+2)^2}{6} - \frac{6 \cdot 3}{6} = \frac{2 \cdot 1}{6}$$

$$2(x+2)^2 - 18 = 2$$

$$2(x^2 + 4x + 2) - 18 = 2$$

$$2x^2 + 8x + 4 - 18 - 2 = 0$$

$$2x^2 + 8x - 16 = 0$$

$$\begin{aligned} x &= \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} = \frac{-(8) \pm \sqrt{(8)^2 - 4 \cdot 2 \cdot (-16)}}{2 \cdot 2} = \frac{-8 \pm \sqrt{64 + 128}}{4} = \\ &= \frac{-8 \pm \sqrt{192}}{4} = \begin{cases} x_1 = \frac{-8 + \sqrt{192}}{4} \\ x_2 = \frac{-8 - \sqrt{192}}{4} \end{cases} \end{aligned}$$

$$4.- (x+2)(x-2)=12$$

$$(x+2)(x-2)=12$$

$$x^2-4=12$$

$$x^2=16$$

$$x = \pm\sqrt{16} = \pm 4 = \begin{cases} x_1 = +4 \\ x_2 = -4 \end{cases}$$

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

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

$$x^2 \cancel{-6x} + 9 + x^2 \cancel{+6x} + 9 = 2$$

$$2x^2+18=2$$

$$2x^2+18-2=0$$

$$2x^2+16=0$$

$$2x^2=-16 \Rightarrow x^2 = \frac{-16}{2} = -8 \Rightarrow x = \sqrt{-8} \Rightarrow \text{No tiene solución}$$