

RADICACIÓN

Fuente: ALLEN, Ángel. ALGEBRA INTERMEDIA. Sexta Edición. Editorial Pearson. México, 2004

Resolver Ecuaciones con Radicales:

$$\begin{aligned}\sqrt{x} &= 7 \\ (\sqrt{x})^2 &= (7)^2 \\ x &= 49\end{aligned}$$

$$\begin{aligned}\sqrt{x-4} - 6 &= 0 \\ \sqrt{x-4} &= 6 \\ (\sqrt{x-4})^2 &= 6^2 \\ x-4 &= 36 \\ x &= 40\end{aligned}$$

$$\begin{aligned}\sqrt[3]{x} + 9 &= 7 \\ \sqrt[3]{x} &= -2 \\ (\sqrt[3]{x})^3 &= (-2)^3 \\ x &= -8\end{aligned}$$

$$x - 2\sqrt{x} - 8 = 0$$

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

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

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

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

$$0 = x^2 - 20x + 64$$

$$0 = (x - 16)(x - 4)$$

$$x - 16 = 0 \quad \text{o} \quad x - 4 = 0$$

$$x = 16$$

$$x = 4$$

$$x = 4$$

$$x - 2\sqrt{x} - 8 = 0$$

$$4 - 2\sqrt{4} - 8 \stackrel{?}{=} 0$$

$$4 - 2(2) - 8 \stackrel{?}{=} 0$$

$$4 - 4 - 8 \stackrel{?}{=} 0$$

$$-8 = 0 \quad \text{Falso}$$

$$x = 16$$

$$x - 2\sqrt{x} - 8 = 0$$

$$16 - 2\sqrt{16} - 8 \stackrel{?}{=} 0$$

$$16 - 2(4) - 8 \stackrel{?}{=} 0$$

$$16 - 8 - 8 \stackrel{?}{=} 0$$

$$8 - 8 \stackrel{?}{=} 0$$

$$0 = 0 \quad \text{Verdadero}$$

$$\sqrt{5x-1} - \sqrt{3x-2} = 1.$$

$$\sqrt{5x-1} = 1 + \sqrt{3x-2}$$

$$(\sqrt{5x-1})^2 = (1 + \sqrt{3x-2})^2$$

$$5x - 1 = (1 + \sqrt{3x-2})(1 + \sqrt{3x-2})$$

$$5x - 1 = 1 + \sqrt{3x-2} + \sqrt{3x-2} + (\sqrt{3x-2})^2$$

$$5x - 1 = 1 + 2\sqrt{3x-2} + 3x - 2$$

$$5x - 1 = 3x - 1 + 2\sqrt{3x-2}$$

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

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

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

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

$$x^2 = 3x - 2$$

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

$$(x-2)(x-1) = 0$$

$$x-2 = 0 \quad \text{o} \quad x-1 = 0$$

Racionalizar:

$$\frac{\sqrt{1}}{\sqrt{2}} = \frac{\sqrt{1} \cdot \frac{\sqrt{2}}{\sqrt{2}}}{\frac{\sqrt{2}}{\sqrt{2}}} = \frac{\sqrt{2}}{2}$$

$$\frac{1}{\sqrt{3}} = \frac{1}{\sqrt{3}} \cdot \frac{\sqrt{3}}{\sqrt{3}} = \frac{\sqrt{3}}{3}$$

$$\begin{aligned}\frac{x - \sqrt{y}}{x + \sqrt{y}} &= \frac{x - \sqrt{y}}{x + \sqrt{y}} \cdot \frac{x - \sqrt{y}}{x - \sqrt{y}} \\ &= \frac{x^2 - x\sqrt{y} - x\sqrt{y} + \sqrt{y}^2}{x^2 - y} \\ &= \frac{x^2 - 2x\sqrt{y} + y}{x^2 - y}\end{aligned}$$

Simplifique $4\sqrt{2} - \frac{1}{\sqrt{8}} + \sqrt{32}$.

$$\begin{aligned}4\sqrt{2} - \frac{1}{\sqrt{8}} + \sqrt{32} &= 4\sqrt{2} - \frac{1}{\sqrt{8}} \cdot \frac{\sqrt{2}}{\sqrt{2}} + \sqrt{16} \sqrt{2} \\ &= 4\sqrt{2} - \frac{\sqrt{2}}{\sqrt{16}} + 4\sqrt{2} \\ &= 4\sqrt{2} - \frac{1}{4}\sqrt{2} + 4\sqrt{2} \\ &= \left(4 - \frac{1}{4} + 4\right)\sqrt{2} \\ &= \frac{31\sqrt{2}}{4}\end{aligned}$$