

## Boletín Repaso Ecuaciones (Ejercicios Resueltos) – Matemáticas 4º

Ejercicio

$$\begin{aligned} \log_7(x-2) - \log_7(x+2) - 1 + \log_7(2x-7) &= 0 \\ \log_7(x-2) - \log_7(x+2) - \log_7 7 + \log_7(2x-7) &= 0 \rightarrow \log_7(x-2) - \log_7(x+2) = \log_7 7 - \log_7(2x-7) \\ \log_7 \frac{(x-2)}{(x+2)} &= \log_7 \frac{7}{(2x-7)} \rightarrow \frac{(x-2)}{(x+2)} = \frac{7}{(2x-7)} \rightarrow (x-2) \cdot (2x-7) = 7 \cdot (x+2) \\ 2x^2 - 7x - 4x + 14 &= 7x + 14 \rightarrow 2x^2 - 7x - 7x - 4x + 14 - 14 = 0 \rightarrow 2x^2 - 18x = 0 \Rightarrow 2x(x-9) = 0 \\ 2x &= 0 \rightarrow x_1 = 0 \\ x - 9 &= 0 \rightarrow x_2 = 9 \end{aligned}$$

$$\begin{aligned} \log(x+1) + \log(x-1) - \log(x-2) &= \log 8 \rightarrow \log \frac{(x+1) \cdot (x-1)}{(x-2)} = \log 8 \rightarrow \frac{(x+1) \cdot (x-1)}{(x-2)} = 8 \\ (x+1) \cdot (x-1) &= 8(x-2) \rightarrow x^2 - 1 = 8x - 16 \rightarrow x^2 - 8x + 15 = 0 \\ x &= \frac{+8 \pm \sqrt{64 - 4 \cdot 1 \cdot 15}}{2 \cdot 1} = \frac{+8 \pm \sqrt{64 - 60}}{2} = \frac{+8 \pm \sqrt{4}}{2} \rightarrow \begin{cases} x_1 = \frac{+8+2}{2} = \frac{10}{2} = 5 \\ x_2 = \frac{+8-2}{2} = \frac{6}{2} = 3 \end{cases} \end{aligned}$$

$$\begin{aligned} 6^{3-x} &= 216 \\ \frac{6^3}{6^x} &= 216 \rightarrow 6^3 = 216 \cdot 6^x \rightarrow 6^x = \frac{6^3}{216} = 1 \rightarrow x = 0 \end{aligned}$$

$$2^{x+1} + 2^{x+2} = 72 \rightarrow 2^x \cdot 2^1 + 2^x \cdot 2^2 = 72 \xrightarrow{z=2^x} 2z + 4z = 72 \rightarrow 6z = 72 \rightarrow z = \frac{72}{6}$$

$$\begin{aligned} 9^x - 10 \cdot 3^x + 9 = 0 \rightarrow (3^2)^x - 10 \cdot 3^x + 9 = 0 \rightarrow (3^x)^2 - 10 \cdot 3^x + 9 = 0 \xrightarrow{z=3^x} z^2 - 10z + 9 = 0 \\ z = \frac{+10 \pm \sqrt{100 - 4 \cdot 1 \cdot 9}}{2 \cdot 1} = \frac{+10 \pm \sqrt{64}}{2} = \frac{+10 \pm 8}{2} \rightarrow \begin{cases} z_1 = \frac{+10+8}{2} = \frac{18}{2} = 9 = 3^x \Rightarrow x_1 = 2 \\ x = \frac{+10-8}{2} = \frac{2}{2} = 1 = 3^x \Rightarrow x_2 = 0 \end{cases} \end{aligned}$$

$$\begin{aligned} 10^x - 5^{x-1} \cdot 2^{x-2} = 950 \rightarrow 10^x - \frac{5^x}{5} \cdot \frac{2^x}{2^2} = 950 \rightarrow 10^x - \frac{5^x \cdot 2^x}{5 \cdot 2^2} = 950 \rightarrow 10^x - \frac{10^x}{20} = 950 \xrightarrow{z=10^x} z - \frac{z}{20} = 950 \\ \frac{20z}{20} - \frac{z}{20} = \frac{950 \cdot 20}{20} \rightarrow 19z = 19000 \rightarrow z = \frac{19000}{19} = 1000 = 10^x \rightarrow x = 3 \end{aligned}$$