

# ECUACIONES EXPONENCIALES

01.- Resolver las siguientes ecuaciones exponenciales:

a)  $0,4^{x-1} = 6,25^{6x-5}$

b)  $10^{\frac{3x-1}{2x+1}} = 100$

c)  $6^x - 9 \cdot 6^{-x} + 8 = 0$

02.- Resuelve:

a)  $3^{x+2} + 3^{x+1} + 3^x + 3^{x-1} = 120$

b)  $3^{2(x+1)} - 18 \cdot 3^x + 9 = 0$

c)  $5^{2x+1} - 3 \cdot 5^{2x-1} = 550$

## SOLUCIONES

### 01 Resolver las siguientes ecuaciones Exponentiales

a)  $0,4^{x-1} = 6,25^{6x-5}$

$$\begin{aligned}\left(\frac{4}{10}\right)^{x-1} &= \left(\frac{625}{100}\right)^{6x-5} \\ \left(\frac{2}{5}\right)^{x-1} &= \left(\frac{5^4}{2^2}\right)^{6x-5} \\ (2/5)^{x-1} &= (2/5)^{2(5-6x)} \\ x-1 &= 10-12x \\ x &= 11/13\end{aligned}$$

$$\begin{aligned}b) \quad 10^{\frac{3x-1}{2x+1}} &= 100 \\ \frac{3x-1}{2x+1} &= 2 \\ 3x-1 &= 4x+2 \\ x &= -3\end{aligned}$$

c)  $6^x - 9 \cdot 6^{-x} + 8 = 0$

$$\begin{aligned}6^x - \frac{9}{6^x} + 8 &= 0 \\ 6^{2x} - 9 + 8 \cdot 6^x &= 0 \\ \text{cambio: } 6^x &= t \\ t^2 + 8t - 9 &= 0 \\ t_1 &= 1 ; t_2 = -9 \\ \begin{cases} 6^x = 1 ; x = 0 \\ 6^x = -9 \text{ sin sentido} \end{cases}\end{aligned}$$

### 02 Resolver las siguientes ecuaciones Exponentiales

a)  $3^{x+2} + 3^{x+1} + 3^x + 3^{x-1} = 120$

$$\begin{aligned}9 \cdot 3^x + 3 \cdot 3^x + 3^x + \frac{3^x}{3} &= 120 \\ 27 \cdot 3^x + 9 \cdot 3^x + 3 \cdot 3^x + 3^x &= 360 \\ (27+9+3+1) \cdot 3^x &= 360 \\ 3^x &= 360/40 \\ 3^x &= 9 ; x = 2\end{aligned}$$

b)  $3^{2(x+1)} - 18 \cdot 3^x + 9 = 0$

$$\begin{aligned}9 \cdot 3^{2x} - 18 \cdot 3^x + 9 &= 0 \\ \text{cambio: } 3^x &= t \\ 9t^2 - 18t + 9 &= 0 \\ t^2 - 2t + 1 &= 0 \\ t_1 &= 1, t_2 = 1 \\ 3^x &= 1 ; 3^x = 3^0 ; x = 0\end{aligned}$$

c)  $5^{2x+1} - 3 \cdot 5^{2x-1} = 550$

$$\begin{aligned}5 \cdot 5^{2x} - \frac{3}{5} \cdot 5^{2x} &= 550 \\ 25 \cdot 5^{2x} - 3 \cdot 5^{2x} &= 2750 \\ (25-3) \cdot 5^{2x} &= 2750 \\ 5^{2x} &= 125 ; 5^{2x} = 5^3 \\ 2x &= 3 ; x = 3/2\end{aligned}$$