

1. Resuelve: $2^{x+3} + 4^{x+1} - 320 = 0$

2. Resuelve: $2 \log(x) + 1 = \log\left(\frac{x}{2}\right)$

3. Resuelve: $\begin{cases} x - y = 27 \\ \log x - \log y = 1 \end{cases}$

4. Si $\log 2=0,3010$, $\log 3= 0,4771$, $\log 5= 0,6990$. Calcula:

a. $\log \sqrt[8]{\frac{1}{0,256}}$ b. $\log \frac{540}{512}$

5. Escribe la expresión algebraica de: $\log A = 4 + 2 \log x + \frac{1}{3} \log(y) - 6 \log z - 3 \log x$

6. Resuelve: $\begin{cases} 2 \log x - \log y = 5 \\ \log(xy) = 4 \end{cases}$

7. Resuelve $\frac{\log(16-x^2)}{\log(3x-4)} = 2$

8. Resuelve $3^{9x^4-10x^2+1} = 1$

$$(5) \log A = 4 + 2 \log x + \frac{1}{3} \log y - 6 \log z - 3 \log x$$

$$\log A = \log 10000 + \log x^2 + \log \sqrt[3]{y} - \log z^6 - \log x^3 =$$

$$= \log 1000 \cdot x^2 \cdot \sqrt[3]{y} - \log z^6 x^3 = \log \frac{1000 x^2 \sqrt[3]{y}}{z^6 x^3} =$$

$$= \log \frac{1000 \sqrt[3]{y}}{z^6 x}$$

$$\log A = \log \frac{1000 \sqrt[3]{y}}{z^6 x} \Rightarrow A = \frac{1000 \sqrt[3]{y}}{z^6 x}$$

$$(6) \begin{cases} 2 \log x - \log y = 5 \\ \log(xy) = 4 \end{cases} \quad \begin{cases} 2 \log x - \log y = 5 \\ \log x + \log y = 4 \end{cases} \quad \begin{cases} \log x = A \\ \log y = B \end{cases}$$

$$\begin{cases} 2A - B = 5 \\ A + B = 4 \end{cases}$$

$$3A = 9 \rightarrow A = 3$$

$$\begin{array}{r} 2A - B = 5 \\ \cdot (-2) \quad -2A - 2B = -8 \\ \hline -3B = -3 \\ B = 1 \end{array}$$

$$\log x = A = 3 \rightarrow x = 10^3 = 1000$$

$$\log y = B = 1 \rightarrow y = 10$$

$$(7) \frac{\log(16-x^2)}{\log(3x-4)} = 2 \rightarrow \log(16-x^2) = 2 \log(3x-4) \Rightarrow \log(16-x^2) = \log(3x-4)^2$$

$$16-x^2 = 9x^2 - 24x + 16 \Rightarrow 10x^2 - 24x = 0 \Rightarrow x(10x - 24) = 0 \quad \begin{cases} x=0 \text{ w} \\ x = \frac{24}{10} = \frac{12}{5} \end{cases}$$

$$(8) 3^{9x^4 - 10x^2 + 1} = 1 \Rightarrow 3^{9x^4 - 10x^2 + 1} = 3^0 \Rightarrow 9x^4 - 10x^2 + 1 = 0$$

$$x^2 = t \Rightarrow 9t^2 - 10t + 1 = 0 \quad t = \frac{10 \pm \sqrt{100 - 36}}{18} = \frac{10 \pm 8}{18} = \begin{cases} \frac{18}{18} = 1 \\ \frac{2}{18} = \frac{1}{9} \end{cases}$$

$$t_1 = 1 \rightarrow x^2 = 1 \rightarrow x = \pm 1$$

$$t_2 = \frac{1}{9} \rightarrow x^2 = \frac{1}{9} \rightarrow x = \pm \frac{1}{3}$$