

Resuelve el siguiente sistema:

$$\begin{cases} (1) & 2 \log x - 3 \log y = 7 \\ (2) & \log x + \log y = 1 \end{cases}$$

$$\begin{cases} (1) & \log x^2 - \log y^3 = 7 \\ (2) & \log(x \cdot y) = \log 10 \end{cases}$$

$$\begin{cases} (1) & \log \frac{x^2}{y^3} = \log 10^7 \\ (2) & \log(x \cdot y) = \log 10 \end{cases} \Rightarrow \begin{cases} \frac{x^2}{y^3} = 10^7 & (1) \\ x \cdot y = 10 & (2) \end{cases}$$

De (2) $x \cdot y = 10 \Rightarrow y = \frac{10}{x}$

$$(1) \quad \frac{x^2}{y^3} = 10^7 \Rightarrow \frac{x^2}{\left(\frac{10}{x}\right)^3} = 10^7$$

$$x^2 = \frac{10^3}{x^3} \cdot 10^7$$

$$x^5 = 10^{10} \Rightarrow x = \sqrt[5]{10^{10}} = 10^2$$

$$\text{Si } y = \frac{10}{x} \Rightarrow y = \frac{10}{100} = \frac{1}{10}$$

$$x = 100$$

$$y = \frac{1}{10}$$

Comprobación: $x = 100; y = \frac{1}{10}$

$$¿2 \log 100 - 3 \log \frac{1}{10} = 7? \Rightarrow 2 \cdot 2 - 3 \cdot (-1) = 7 \text{ (Si)}$$

$$¿\log 100 + \log \frac{1}{10} = 1? \Rightarrow 2 + (-1) = 1 \text{ (Si)}$$

$$\text{Solución: } x = 100; y = \frac{1}{10}$$