

1.- Calcula

- a)  $\log_2 8$
- b)  $\log_3 9$
- c)  $\log_4 2$
- d)  $\log_{27} 3$
- e)  $\log_{\frac{1}{5}} 0,2$

$\begin{aligned} \text{a) } \log_2 8 = x &\Rightarrow \\ \Rightarrow 2^x = 8 &\Rightarrow 2^x = 2^3 \\ \underline{x=3} \end{aligned}$	$\begin{aligned} \text{b) } \log_3 9 = x &\Rightarrow \\ \Rightarrow 3^x = 9 &\Rightarrow 3^x = 3^2 \\ \underline{x=2} \end{aligned}$	$\begin{aligned} \log_4 2 = x &\Rightarrow \\ \Rightarrow 4^x = 2 &\Rightarrow (2^2)^x = 2 \\ 2x = 1 &\Rightarrow x = \frac{1}{2} \\ \underline{x = \frac{1}{2}} \end{aligned}$	$\begin{aligned} \log_{27} 3 = x &\Rightarrow \\ 27^x = 3 &\Rightarrow (3^3)^x = 3 \\ \Rightarrow 3x = 1 &\Rightarrow x = \frac{1}{3} \\ \underline{x = \frac{1}{3}} \end{aligned}$	$\begin{aligned} \log_{\frac{1}{5}} 0,2 = x \\ 5^x = 0,2 &\Rightarrow 5^x = \frac{1}{5} \\ 5^x = 5^{-1} &\Rightarrow x = -1 \\ \underline{x = -1} \end{aligned}$
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2.- Utiliza las propiedades de los logaritmos para reducir un único logaritmo:

- a)  $\log a + \log b$
- b)  $\log x - \log y$
- f)  $\log 2 + \log 3 + \log 4$
- g)  $\frac{1}{3} \log a - \frac{1}{2} \log b - \frac{1}{2} \log c$
- k)  $\frac{1}{2} \log x - \frac{1}{3} \log y + \frac{1}{4} \log z$
- l)  $\log(a-b) - \log 3$

$$\text{a) } \log a + \log b = \log(a \cdot b)$$

$$\text{b) } \log x - \log y = \log \frac{x}{y}$$

$$\text{f) } \log 2 + \log 3 + \log 4 = \log(2 \cdot 3 \cdot 4) = \log 24$$

$$\text{g) } \frac{1}{3} \log a - \frac{1}{2} \log b - \frac{1}{2} \log c = \log a^{1/3} - \log b^{1/2} - \log c^{1/2} = \log \frac{a^{1/3}}{b^{1/2} \cdot c^{1/2}} = \log \frac{\sqrt[3]{a}}{\sqrt{b \cdot c}}$$

$$\text{k) } \frac{1}{2} \log x - \frac{1}{3} \log y + \frac{1}{4} \log z = \log x^{1/2} - \log y^{1/3} + \log z^{1/4} = \log \frac{\sqrt{x} \cdot \sqrt[4]{z}}{\sqrt[3]{y}}$$

$$\text{l) } \log(a-b) - \log 3 = \log \frac{a-b}{3}$$