

NOMBRE:

NOTA:

1. (1,5 puntos cada apartado) Calcula utilizando la definición de logaritmo.

$$a) \log_7 \frac{1}{49} = \log_7 7^{-2} = -2 \Leftrightarrow 7^x = 7^{-2}$$

$$b) \log_{1/2} 2\sqrt{2} = \log_{1/2} 2 \cdot 2^{1/2} = \log_{1/2} 2^{3/2} = \log_{2^{-1}} 2^{3/2} = -\frac{3}{2} \Leftrightarrow (2^{-1})^x = 2^{3/2}$$

$$2^{-x} = 2^{3/2}$$

$$c) \log_a(0,2) = -1 \quad a^{-1} = \frac{2}{10} \rightarrow a^{-1} = \frac{1}{5} \rightarrow a^{-1} = 5^{-1} \rightarrow a = 5$$

$$d) \log_a \sqrt[3]{3} = -\frac{1}{2} \quad \left(a^{-\frac{1}{2}}\right)^{-2} = \left(3^{\frac{1}{2}}\right)^{-2} \rightarrow a = 3^{-1} \rightarrow a = \frac{1}{3}$$

2. (2 puntos cada apartado) Sabiendo que $\log_3 x = 0,1$ y que $\log_3 y = 1,2$ calcula:

$$\begin{aligned} \text{a) } \log_3 \frac{9x}{y} &= \log_3 9x - \log_3 y = \log_3 9 + \log_3 x - \log_3 y = \\ &= \log_3 3^2 + \log_3 x - \log_3 y = 2 \cdot \log_3 3 + \log_3 x - \log_3 y = \\ &= 2 \cdot 1 + 0,1 - 1,2 = 0,9 \end{aligned}$$

$$\begin{aligned} \text{b) } \log_3 \sqrt[3]{\frac{81x}{y^2}} &= \log_3 \left(\frac{81x}{y^2} \right)^{\frac{1}{3}} = \frac{1}{3} \log_3 \frac{3^4 x}{y^2} = \\ &= \frac{1}{3} \left(\log_3 3^4 x - \log_3 y^2 \right) = \frac{1}{3} \left(\log_3 3^4 + \log_3 x - \log_3 y^2 \right) = \\ &= \frac{1}{3} \left(4 \log_3 3 + \log_3 x - 2 \log_3 y \right) = \frac{1}{3} \left(4 \cdot 1 + 0,1 - 2 \cdot 1,2 \right) = \\ &= 0,56 \end{aligned}$$