

2. Use a definição para resolver:

$$\begin{aligned} \text{a) } \log_2 \frac{1}{4} \\ 2^x &= \frac{1}{4} \\ 2^x &= \frac{1}{2^2} \\ 2^x &= 2^{-2} \\ x &= -2 \end{aligned}$$

$$\begin{aligned} \text{b) } \log_3 \sqrt{3} \\ 3^x &= \sqrt{3} \\ 3^x &= 3^{\frac{1}{2}} \\ x &= \frac{1}{2} \end{aligned}$$

$$\begin{aligned} \text{c) } \log_9 16 \\ 9^x &= 16 \\ (2^3)^x &= 2^4 \\ 3x &= 4 \\ x &= \frac{4}{3} \end{aligned}$$

$$\begin{aligned} \text{d) } \log_4 128 \\ 4^x &= 128 \\ (2^2)^x &= 2^7 \\ 2x &= 7 \\ x &= \frac{7}{2} \end{aligned}$$

$$\begin{aligned} \text{e) } \log_{36} \sqrt{6} \\ 36^x &= \sqrt{6} \\ (6^2)^x &= 6^{\frac{1}{2}} \\ 2x &= \frac{1}{2} \\ x &= \frac{1}{4} \end{aligned}$$

$$\begin{aligned} \text{f) } \log 0,01 \\ 10^x &= 0,01 \\ 10^x &= 10^{-2} \\ x &= -2 \end{aligned}$$

$$\rightarrow x = \frac{1}{4}$$

$$g) \log_9 9 = \frac{1}{24}$$

$$(3^2)^x = \frac{1}{3^3}$$

$$(3^2)^x = 3^{-3}$$

$$2x = -3$$

$$x = -\frac{3}{2}$$

$$\underline{\underline{x = -\frac{3}{2}}}$$

$$h) \log_{0,2} \sqrt[3]{25}$$

$$0,2^x = \sqrt[3]{25}$$

$$\left(\frac{1}{5}\right)^x = 5^{\frac{2}{3}}$$

$$0,2 = \frac{1}{5}$$

$$5^{-x} = 5^{\frac{2}{3}}$$

$$-x = \frac{2}{3} (-1)$$

$$x = -\frac{2}{3}$$

$$i) \log_{1,25} 0,64$$

$$1,25^x = 0,64$$

$$1,25 = \frac{5}{4}$$

$$\left(\frac{5}{4}\right)^x = \left(\frac{4}{5}\right)^2$$

$$0,64 = \frac{4^2}{5^2}$$

$$\left(\frac{4}{5}\right)^{-x} = \left(\frac{4}{5}\right)^2$$

$$-x = 2 (-1)$$

$$x = -2$$

$$j) \log_{\frac{5}{3}} 0,6$$

$$\left(\frac{5}{3}\right)^x = 0,6$$

$$\left(\frac{5}{3}\right)^x = \frac{6}{10}$$

$$\left(\frac{5}{3}\right)^x = \frac{3}{5}$$

$$\left(\frac{5}{3}\right)^x = \left(\frac{5}{3}\right)^{-1}$$

$$x = -1$$