2. Use a definição para calcular:

a) $\log_2 \frac{1}{4}$

$2^x = \frac{1}{4}$

$2^x = \frac{1}{2^2}$

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

$x = -2$ //

b) $\log_3 \sqrt{3}$

$3^x = \sqrt{3}$

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

$x = \frac{1}{2}$ //

c) $\log_8 16$

$8^x = 16$

$(2^3)^x = 2^4$

$3x = 4$

$x = \frac{4}{3}$ //

d) $\log_4 128$

$4^x = 128$

$(2^2)^x = 2^7$

$2x = 7$

$x = \frac{7}{2}$ //

e) $\log_{36} \sqrt{6}$

$36^x = \sqrt{6}$

$(6^2)^x = 6^{\frac{1}{2}}$

$2x = \frac{1}{2}$

$x = \frac{\frac{1}{2}}{2} \rightarrow x = \frac{1}{4}$ //

f) $\log 0{,}01$

$10^x = 0{,}01$

$10^x = 10^{-2}$

$x = -2$ //

g) $\log_9 \frac{1}{27}$

$9^x = \frac{1}{27}$

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

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

$2x = -3$

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

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

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

$\left(\frac{1}{5}\right)^x = 5^{\frac{2}{3}}$ $\quad 0,2 = \frac{1}{5}$

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

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

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

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

$1,25^x = 0,64$ $\quad 1,25 = \frac{5}{4}$

$\left(\frac{5}{4}\right)^x = \left(\frac{4}{5}\right)^2$ $\quad 0,64 = \frac{4^2}{5^2}$

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

$-x = 2$ (-1)

$x = -2$ //

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

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

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

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

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

$x = -1$