AGORA É COM VOCÊ

01.

a) $\log_5 625 = x$

$5^x = 625$

$5^x = 5^4$

$x = 4$

b) $\log_{1/5} 25 = x$

$(1/5)^x = 25$

$(1/5)^x = 5^2$

$x = -2$

c) $\log_3 \sqrt{27} = x$

$3^x = (3^3)^{1/2}$

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

$x = 3/2$

d) $\log_3 \sqrt[3]{9} = x$

$3^x = 9^{1/3}$

$3^x = (3^2)^{1/3}$

$x = 2/3$

e) $\log_{0,2} 0,008 = x$

$0,2^x = 0,008$

$(2/10)^x = (2/10)^3$

$x = 3$

f) $\log_{\frac{1}{7}} \frac{1}{343} = x$

$(1/7)^x = 1/343$

$(1/7)^x = 1/7^3$

$x = 3$

g) $\log_{512} \sqrt{2} = x$

$512^x = \sqrt{2}$

$(2^9)^x = 2^{1/2}$

$x = 1/18$

h) $\log_{\sqrt[5]{729}} \sqrt[3]{81} = x$

$([3^6]^{1/5})^x = (3^4)^{1/3}$

$3^{6x/5} = 6^{4/3}$

$x = 10/9$

02.

a) $\log_x 8 = 3$

$x^3 = 8$

$x^3 = 2^3$

$x = 2$

b) $\log_{\sqrt[5]{2}} x = 5$

$(\sqrt[5]{2})^5 = x$

$2 = x$

c) $\log_x \frac{1}{25} = 2$

$x^2 = 1/25$

$x^2 = (1/5)^2$

$x = 1/5$

d) $\log_{\frac{2}{3}} \frac{8}{27} = x$

$(2/3)^x = 8/27$

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

$x = 3$

e) $\log_x 0,0016 = 4$

$x^4 = 16/10000$

$x^4 = (2/10)^4$

$x = 1/5$

f) $\log_{0,5} x = 2$

$0,5^2 = x$

$0,25 = x$

03.

a) $1 + \log_3 1 - 1 =$

$\log_3 1 = x$

$x = 0$

b) $\log_2 -2.2^2 + \log_2 2.2^{-2}$

$-1 + (-1) = -2$

c) $3 + 2 = 5$

d) $\log_2 64 - \log_{27} 3 =$

$6 - 1/3 = 17/3$

e) $\log 10^3 + \log 10^2 + \log 10 =$

$3.1 + 2.1 + 1.1 =$

$3 + 2 + 1 = 6$

f) $\log_5^2 5 - \log_9^2 9 + 0 =$

$1/2 + 1/2 = 1$

g) $\ln(e^{1/3}) + e^{\ln 2}$

$1/3 + 2 = 7/3$

04.

$$\frac{\log_3 1 + \log 0,01}{\log_2 \frac{1}{64} . \log_2 \sqrt{8}} = \frac{0 + \log 10^{-2}}{\log_2 2^{-6} . \log_2 2^{3/2}} = \frac{0 - 2}{-6 . 3/2} = \frac{-2}{-9} = \frac{2}{9}$$

05.

$a^c = b \quad \leftrightarrow \quad \log_a b = c$

06.

$\log_9 6561 = x$

$9^x = 6561$

$9^x = 9^4$

$x = 4$

07.

$\log_2 16 = x$

$2^x = 16$

$2^x = 2^4$

$x = 4$

$\log_2(x^2 - 5x + 5)$

$\log_2(4^2 - 5.4 + 5)$

$\log_2(16 - 20 + 5)$

$\log_2 1 = 0$

08.

$\log_n(\log_n \sqrt[n^4]{n}) =$

$\log_n[\log_n(n^{\frac{1}{n^4}})] =$

$\log_n[\frac{1}{n^4}.\log_n(n)] =$

$\log_n[\frac{1}{n^4}.1] =$

$\log_n n^{-4} = -4 . 1 = -4$

09.

$\log E = 11,8 + 1,5 . 8,2$

$\log E = 11,8 + 12,3$

$\log E = 24,1$

$E = 10^{24,1}$

10.

$PH = - \log [H^+]$

$PH = - \log 10^{-x}$

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

10^{-5}