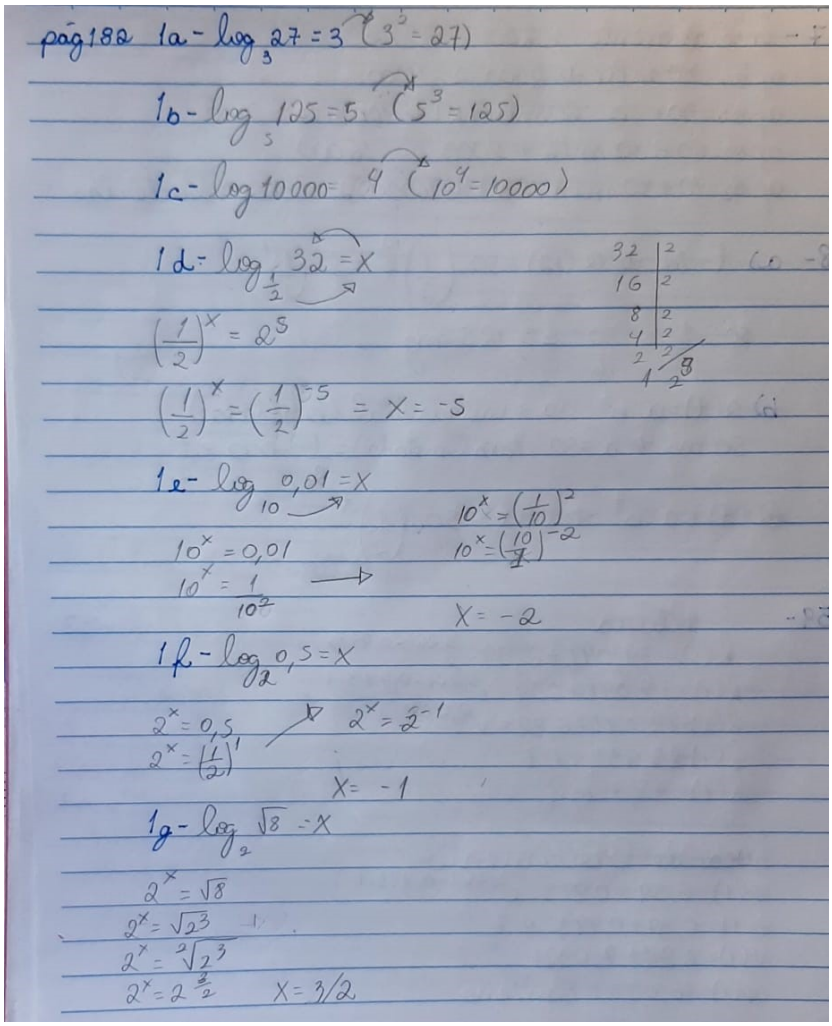
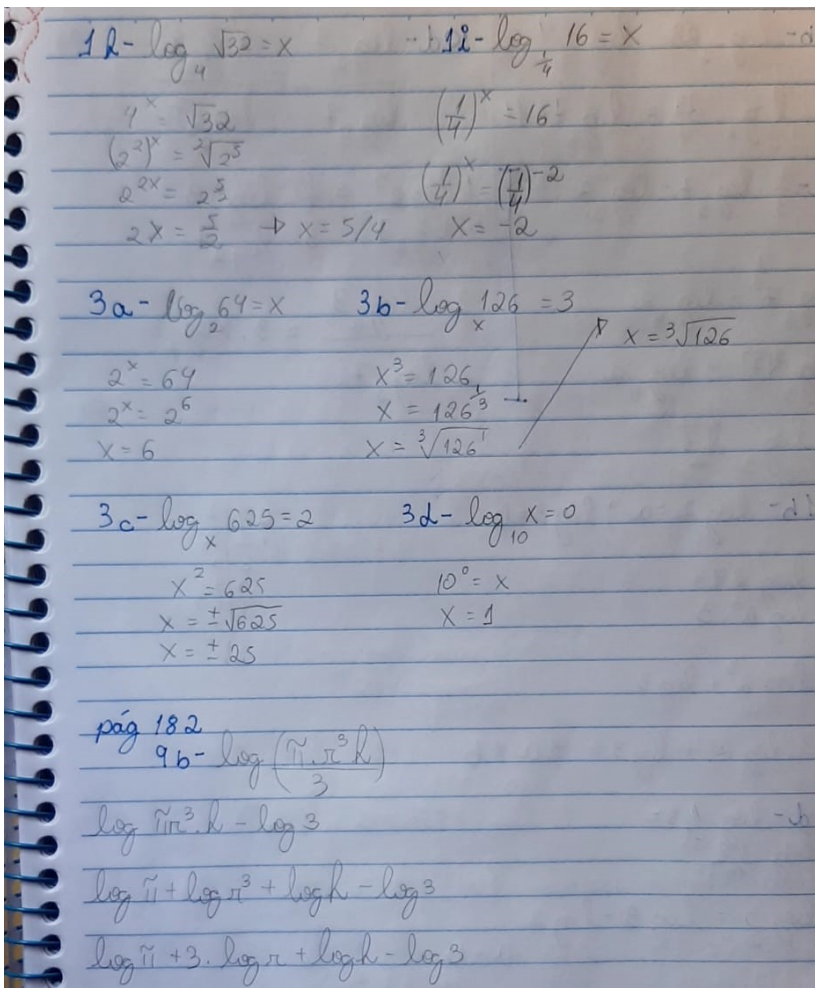
Nome: Giulia Ventura Favaro - N° 17 – 1D.S.





10b- $\log_7 28 - \log_7 4 =$

$\log_7 \frac{28}{4} = \log_7 7 = 1$

10c- $\frac{1}{3} \cdot \log_3 7 - \log_3 2$

$\log_3 7^{\frac{1}{3}} - \log_3 2$

$\log_3 \sqrt[3]{7} - \log_3 2$

$\log_3 \frac{\sqrt[3]{7}}{2}$

10d- $\frac{\log_2 3}{\log_8 7} = \frac{\log_2 3}{\log_{2^3} 7}$

$\frac{1 \log_2 3}{\frac{1}{3} \cdot \log_2 7} = \frac{1}{\frac{1}{3}} \cdot \frac{\log_2 3}{\log_2 7}$

$3 \cdot \frac{\log_2 3}{\log_2 7} = 3 \cdot \log_7 3$

11b- $\log 2 = a$; $\log 3 = b$

$\log 24 =$

$\log 2^3 \cdot 3$

$\log 2^3 + \log 3$

$3 \cdot \log 2 + \log 3 = 3a + b$

24	2
12	2
6	2
3	3
1	

$2^3 \cdot 3$

11d- $\log 1{,}5 =$

$\log \frac{15 : 5}{10 : 5}$

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

$a - b$

13- $\log \left(\frac{ab^2}{c}\right)$

$\log ab^2 - \log c$

$\log a + 2\log b - \log c$

$5 + 2 \cdot 3 - 2 = 9$

14- $\log_a 100$

$\log 2^2 \cdot 5^2$

$\log_a 2^2 + \log_a 5^2$

$2 \cdot \log_a 2 + 2 \log_a 5$

$2 \cdot 20 + 2 \cdot 30 = 100$

100	2
50	2
25	5
5	5
1	

$2^2 \cdot 5^2$

18- $\log_a x = 4$

$a^4 = x$

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

$\left(\frac{x^{\frac{1}{4}}}{3}\right)^8 = x$

$\frac{\left(\frac{1}{4}\right)^8}{3^8} = x$

$\frac{x^{\frac{1}{4} \cdot 8}}{3^8} = x$

$\frac{x^2}{3^8} = x$

$\frac{x^2}{x^1} = 3^8 \rightarrow x^{2-1} = 3^8 \quad x = 3^8$

$\log_{\frac{a}{3}} x = 8$

$\left(\frac{a}{3}\right)^8 = x$

19- $\log_3 5 \cdot \log_{2^2} 3^3 \cdot \log_5 2^{\frac{1}{2}} =$

$\log_3 5 \cdot \frac{3}{2} \cdot \log_2 3 \cdot \frac{1}{2} \cdot \log_5 2$

$\log_3 5 \cdot \frac{3}{2} \log_2 3 \cdot \frac{1}{2} \cdot \frac{1}{2} \log_5 2$

$\log_3 5 \cdot \frac{3}{2} \log_2 3 \cdot \frac{1}{4} \log_5 2$

$\frac{\log_2 5}{\log_2 3} \cdot \frac{3}{2} \cdot \frac{\log_2 3}{1} \cdot \frac{1}{4} \cdot \frac{\log_2 2}{\log_2 5}$

$\frac{3}{2} \cdot \frac{1}{4} = \frac{3}{8}$

24b- $\frac{\log 0,0002}{\log \frac{2}{10000}}$

$\log 2 - \log 10000$

$0,3 - \log 10^4$

$0,3 - 4 \log 10$

$0,3 - 4 \cdot 1 = -3,7$

24f- $\frac{\log 250}{\log 5^2 \cdot 10}$

$\log 5^2 + \log 10$

$2 \log 5 + \log 10$

$2 \cdot 0,70 + 1$

$1,4 + 1 = 2,4$

33- $m = c.(1+i)^M \rightarrow 15000000 = 800000.(1+1,2)^M$

Dados:

$c = 800000$

$i = 12\% = 0,12$

$t = ? = M$

$J = 700000$

$M = c + J$

$M = 800000 + 700000 = 1500000$

$\frac{15000000}{800000} = 12^M$

$1,875 = 1,12^M$

$\log 1,875 = \log 1,12^M$

$\log 1,875 = M . \log 1,12$

$\frac{\log 1,875}{\log 1,12} = M$

$\log 1,875 \simeq 0,27$

$\log 1,12 \simeq 0,05$

$\frac{0,27}{0,05} = M$

$M = \frac{27}{5}$ anos

35- $M = C.(1+i)^M$

$C = 1000$

$i\ 1,5\% = 0,015$

$M = 1300$

$M = ?$

$1300 = 1000(1+0,015)^M$

$\frac{1300}{1000} = 1,015^M$

$1,3 = 1,015^M$

$\log 1,3 = \log 1,015^M$

$\log 1,3 = M \log 1,015$

$\frac{\log 1,3}{\log 1,015} = M$

$\frac{0,11}{0,006} \simeq M$

$M \simeq 18,3 = 19$ meses

37-

$T_a = 30°C$

$T_F = 100°C \rightarrow T = 0 \rightarrow \Delta T_0 = 100 - 30 = 70$

$T_R = 65°C \rightarrow T = 5 min \rightarrow \Delta T(5) = 65 - 30 = 35$ i)

$T_{Fi} = 37°C \rightarrow t = ? \rightarrow \Delta T(t) = 37 - 30 = 7$ ii)

$\Delta T(t) = \Delta T_0 . e^{-\alpha . t} = 70 . e^{-\alpha . t}$

i) $\Delta T(5) = 35$

$70 . e^{-\alpha . 5} = 35$

$e^{-\alpha . 5} = \frac{35}{70}$ (:35)

$(e^{-\alpha})^5 = \frac{1}{2}$

$e^{-\alpha} = 5\sqrt{\frac{1}{2}}$ ∆

ii) $\Delta T(t) = 7$

$70 . e^{-\alpha . t} = 7$

$e^{-\alpha . t} = \frac{7}{70}$ (:7)

$(e^{-\alpha})^t = \frac{1}{10}$

$\left(5\sqrt{\frac{1}{2}}\right)^t = \frac{1}{10}$

$\log \left(5\sqrt{\frac{1}{2}}\right)^t = \log \frac{1}{10}$

$t \log 5\sqrt{2^{-1}} = \log 10^{-1}$

$t \log 2^{\frac{-1}{5}} = \log 10^{-1}$

$t \left(\frac{-1}{5}\right) \log 2 = -1 \log 10$

$t \cdot \frac{-0,3}{5} = -1 . 1$

$t \cdot \frac{-0,3}{5} = -1 \rightarrow t = \frac{5 . (-1)}{-0,3}$

$t \simeq 17$ min

39- $\gamma = 8\% \ (0{,}08)$

$Q_0 = 50g$

$\ln 0{,}1 \cong -2{,}3$

$Q(t) = 5$

$Q_0 \cdot e^{-\gamma \cdot t} = 5$

$50 \cdot e^{-0{,}08 \cdot t} = 5$

$e^{-0{,}08t} = \frac{5}{50} \rightarrow 0{,}1$

$\log_e e^{-0{,}08t} = \log 0{,}1$

$-0{,}08t \cdot \log_e e = \log_e 0{,}1$

$0{,}08t \cdot 1 = \ln 0{,}1$

$-0{,}08t = -2{,}3$

$t = \frac{-2{,}3}{-0{,}08} \rightarrow t = 28{,}75$ anos

41- $\gamma = 4\% \rightarrow 0{,}04$

$Q(t) = \frac{Q_0}{2}$

$\ln 0{,}3 \cong 0{,}7$

$Q(t) = Q_0 \cdot e^{-\gamma \cdot t}$

$\frac{Q_0}{2} = Q_0 \cdot e^{-0{,}04 \cdot t}$

$\frac{Q_0}{2Q_0} = e^{-0{,}04 \cdot t}$

$\frac{1}{2} = e^{-0{,}04 \cdot t}$

$\ln 0{,}5 = \ln e^{-0{,}04t}$

$-0{,}7 = -0{,}04t \ln e$

$\frac{-0{,}7}{-0{,}04} = t \cdot 1$

$t = 17{,}5$ anos