

SOLUCIONES BOLETIN LOGARITMOS

1) a) $\log_8\left(\frac{1}{8}\right) = \log_8 8^{-1} = \boxed{-1}$
 b) $\log_4 8 = x \Rightarrow 4^x = 8; 2^{2x} = 2^3 \Rightarrow 2x = 3 \Rightarrow \boxed{x = \frac{3}{2}}$

2) Conocido $\log 2 = 0'3010$. Calcule

a) $\log 5 = \log\left(\frac{10}{2}\right) = \log 10 - \log 2 = 1 - 0'3010 = \boxed{0'6990}$
 b) $\log 0'04 = \log\left(\frac{4}{100}\right) = \log\left(\frac{1}{25}\right) = \log 5^{-2} = -2 \cdot \log 5 = \boxed{-1'398}$
 c) $\log 2500 = \log(25 \cdot 100) = \log 25 + \log 100 = 2 \cdot \log 5 + 2 \cdot \log 10 =$
 $= 1'398 + 2 = \boxed{3'398}$

a) $\log_a 0'001 = -3 \Rightarrow a^{-3} = 10^{-3} \Rightarrow \boxed{a = 10}$

b) $\log_a \frac{1}{81} = 4 \Rightarrow a^4 = \frac{1}{81} = 3^{-4} = (3^{-1})^4 \Rightarrow a = 3^{-1} = \boxed{\frac{1}{3}}$

a) $\log_5 x = 2 \Rightarrow x = 5^2 = \boxed{25}$

b) $\log_8 x = \frac{1}{3} \Rightarrow x = 8^{\frac{1}{3}} = (2^3)^{\frac{1}{3}} = \boxed{2}$

a) $\log_a 0'01 = -2 \Rightarrow a^{-2} = 0'01 = 10^{-2} \Rightarrow \boxed{a = 10}$

b) $\log_a 2 = 0'25 \Rightarrow \log_a 2 = \frac{1}{4} \Rightarrow a^{\frac{1}{4}} = 2 \Rightarrow a = 2^4 = \boxed{16}$

$\log_2 0'125 = \log_2 \frac{1}{8} = \log_2 2^{-3} = \boxed{-3}$

Sabiendo que $\log 2 = 0'3$ y $\log 3 = 0'48$. Calcular $\log 0'18$

$\log 0'18 = \log(0'2 \cdot 0'9) = \log 0'2 + \log 0'9 = \log 2 - \log 10 + \log 9 - \log 10 =$
 $0'3 - 1 + 2 \cdot 0'48 - 1 = 1'26 - 2 = \boxed{-0'74}$

a) $\log_3 x = 4 \Rightarrow 3^4 = x \Rightarrow \boxed{x = 81}$

b) $\log_x 243 = 5 \Rightarrow x^5 = 243 = 3^5 \Rightarrow \boxed{x = 3}$

c) $\log_{15} 2'25 = x \Rightarrow (1'5)^x = 2'25 = (1'5)^2 \Rightarrow \boxed{x = 2}$

d) $\log_2 (8x) = 5 \Rightarrow 8x = 2^5 \Rightarrow x = \frac{2^5}{8} = \boxed{4}$

e) $\ln\left(\frac{e}{x^2}\right) = -1$

$\ln e - \ln x^2 = -1$

$1 - 2 \cdot \ln x = -1$

$-2 \ln x = -2$

$\ln x = 1 \Rightarrow \boxed{x = e}$