Practice logs

$\log_b N = e \Leftrightarrow b^e = N$

1. $\log_3 27 = 3$

   $3^3 = 27$

b) $10^3 = 1000$

c) $36^{-1/2} = \frac{1}{6}$

d) $\frac{1}{2}^{-4} = 16$

2a) $\log_2 \frac{1}{2} = -1$

b) $\log_9 81 = 2$

c) $\log_{27} 9 = \frac{2}{3}$

$\log_b N = e$

3a) $\log_5 x = 2$

$5^2 = x$

$\boxed{25 = x}$

b) $\log_7 x = -2$

$7^{-2} = x$

$\frac{1}{7^2} = x$

$\frac{1}{49} = x$

c) $\log_3 x = -4$

$3^{-4} = x$

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

$\frac{1}{81} = x$

d) $\log_5 125 = x$

$5^x = 125$

$x = 3$

e) $\log_2 \frac{1}{64} = x$

$2^x = \frac{1}{64}$

$2^x = 64^{-1}$

$2^x = 2^{-6}$

$x = -6$

f) $3^x = \frac{1}{9}$

$x = -2$

g) $x^3 = 64$

$x = \sqrt[3]{64}$

$x = 4$

* think

$x^2 = 36$

$x = \sqrt{36}$

$* (x^{2 \cdot 1/2}) = 36^{1/2}$

x^1

h) $6^{-1} = x$

$\frac{1}{6} = x$

i) $\log x = 3$

$10^3 = x$

$1000 = x$

j) $\log_x 3 = \frac{-1}{3}$

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

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

$x^1 = \frac{1}{3^3} = \frac{1}{27}$

k) $\log_8 8 = x$

$8^x = 8$

$x = 1$

l) $\log_x \frac{1}{27} = \frac{-3}{4}$

$x^{\frac{-3}{4}} = \frac{1}{27}$

$(x^{-\frac{3}{4}})^{\frac{-4}{3}} = (\frac{1}{27})^{-\frac{4}{3}}$

$x^1 = 27^{4/3} \Rightarrow \sqrt[3]{27^4} \Rightarrow 81$

3. a) 1.91 ~~d)~~
b) 1.13 e) 3.22
c) 2.71 ~~f)~~

* $\frac{\ln 15}{\ln e}$

or $\frac{\log 15}{\log 2.718}$