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For positive real numbers a, b and x with $a \neq 1$ and $b \neq 1$

$$\log_b x = \frac{\log_a x}{\log_a x} = \frac{\ln x}{\ln x}$$

Rewrite the following as an exponential function then solve for y

A) $y = \log_4 7$ → $4^y = 7$

$\log 4^y = \log 7$

$\frac{y \log 4}{\log 4} = \frac{\log 7}{\log 4}$

$y = \frac{\log 7}{\log 4}$

$y = \frac{\ln 7}{\ln 4}$

Use the change of base formula and your calculator to evaluate the logarithm

A) $\log_3 16$

$\frac{\log 16}{\log 3}$

$\frac{\ln 16}{\ln 3}$

B) $\log_{1/2} 2$

$\frac{\log 2}{\log 1/2}$

$\frac{\ln 2}{\log 1/2}$

Express using only natural logarithms

A) $g(x) = \log_5 x$

$g(x) = \frac{\ln x}{\ln 5}$

B) $g(x) = \log_2(x+y)$

$g(x) = \frac{\ln(x+y)}{\ln 2}$

Describe the transformation of each function from the original function ln(x) or log(x)

42) $f(x) = \ln(x) + 2$

up 2

44) $f(x) = \ln(-x) + 2$

up 2

reflect over y-axis

46) $f(x) = \ln(5 - x)$

right 5

reflect over y-axis

A) $f(x) = \ln(x - 5)$

right 5

52) $f(x) = -3\log(1-x) + 1$

reflection over x-axis

reflection over y-axis

vertical stretch by factor of 3

right 1

up 1

B) $y = \frac{1}{3}\log x$

Vert compression by factor $\frac{1}{3}$

C) $y = \log(2x)$

Horizontal compression by a factor of $\frac{1}{2}$

D) $y = \log\left(\frac{1}{2}x\right)$

Horizontal stretch by a factor of 2