Special Logs

Common logarithm: base 10 $\log 100 \quad 10^{?} = 100$

$\log_{10} x = \log x$ *(tells you the exponent on the 10 that gives you x as an answer.)*

$10^{?} = x$

Natural logarithm: base *e* $\log_e = \ln$

$\log_e x = \ln x$ *(tells you the exponent on the e that gives you x as an answer.)*

$e^{?} = x$

Use a calculator to evaluate the logarithm.

a. $\log 0.85$ $10^{?} = 0.85$ -0.07058

b. $\ln 22$ $e^{?} = 22$ 3.09

Inverses:

$y = b^x$ and $y = \log_b x$ are inverse functions

$x = b^y$

$\log_b x = y$

Two rules:

$b^{\log_b x} = x$ $\log_b b^x = x$

Simplify:

a. $10^{\log 4} = 4$

b. $e^{\log x} = x$

c. $\log_3 3^{3x} = -3x$

d. $\log_2 16^x = \log_2 (2^4)^x = \log_2 (2)^{4x} = 4x$

e. $\log_3 27^x = \log_3 (3^3)^x = \log_3 (3)^{3x}$

$= 3x$