$$\log_b a = x \quad \Leftrightarrow \quad b^x = a$$

Logarithmic Form

Exponential Form

$\log_5 125 = x$

$\log_4 64 = x$

$\log_{64} 2 = x$

$\log .01 = x$

$$\log_2 \frac{1}{8} = x \qquad \log_6 2 = x$$

$$\log_2 2 + \log_3 3 \log_4 4 = x$$

$$11 \times \log 10 + \log 1 = x$$

Properties of Logarithms

Product Property: $\log_b(mn) = \log_b(m) + \log_b(n)$

Power Property: $\log_b(m^n) = n \cdot \log_b(m)$

Quotient Property: $\log_b(m/n) = \log_b(m) - \log_b(n)$

$\log(6 \cdot 11)$

$\log(5 \cdot 3)$

$$\log\left(3 \cdot 2^3\right)$$

$$\log\left(x \cdot y \cdot z^2\right)$$

$$\log\left(\frac{6}{11}\right)^5$$

$$\log\left(\frac{6}{5}\right)^6$$

$$\log \sqrt[3]{x \cdot y \cdot z}$$

$$\log \frac{2^4}{5}$$

Change of base formula

$$\log_c a = \frac{\log a}{\log c}$$

$\log_3 3.3$

$\log_2 30$

$\log_7 8.7$

$\log_6 13$

$\log_9 71$

$\log_3 62$