

Properties of Logarithms

Let m and n be positive numbers, b must be a positive number other than 1 and p may be any real number for the following properties.

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|-------------------------|--|
| Definition of Logarithm | $b^p = m \Leftrightarrow \log_b m = p$ |
| Product | $\log_b m + \log_b n = \log_b mn$ |
| Quotient | $\log_b m - \log_b n = \log_b \frac{m}{n}$ |
| Power | $\log_b m^p = p \cdot \log_b m$ |
| One-To-One | If $\log_b m = \log_b n$, then $m = n$ |

Other Useful Information

$$\log_b b^n = n$$

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

$$\log_b 1 = 0$$

$$\log_b b = 1$$

$$\log_2 2^n = n$$

$$2^{\log_2 2} = 2$$

$$\log_2 1 = 0$$

$$\log_2 2 = 1$$

$$\log 10^n = n$$

$$10^{\log m} = m$$

$$\log 1 = 0$$

$$\log 10 = 1$$

$$\ln e^n = n$$

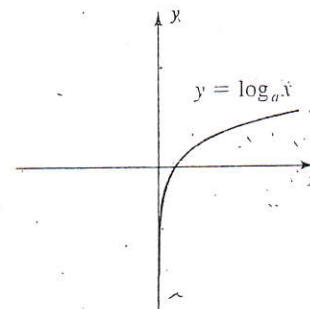
$$e^{\ln m} = m$$

$$\ln 1 = 0$$

$$\ln e = 1$$

Change of Base Formula

$$\log_b m = \frac{\log_a m}{\log_a b}$$



Logarithmic function (includes