

Review of exponents and logarithms

If n is a positive integer, (1,2,3,...), then $b^n = b \bullet b \bullet b \bullet \bullet \bullet b$, $b^0 = 1$, and $b^{-n} = \frac{1}{b^n}$.

n factors

If b is a positive real number, then b^p can be defined for any real exponent p .

If $b > 0$, $b \neq 1$, and $a > 0$, then the base- b logarithm of a , denoted $\log_b a$, is the exponent you put on b to get a : $\log_b a = p$ means $b^p = a$.

$$b^m \bullet b^n = b^{m+n} \qquad \log_b(xy) = \log_b x + \log_b y .$$

$$\frac{b^m}{b^n} = b^{m-n} \qquad \log_b\left(\frac{x}{y}\right) = \log_b x - \log_b y .$$

$$(b^m)^n = b^{mn} \qquad \log_b(x^y) = y \log_b x .$$

$$(ab)^n = a^n b^n. \qquad \text{Change-of-base formula:}$$

$$\left(\frac{a}{b}\right)^n = \frac{a^n}{b^n} \qquad \log_a x = \frac{\log_b x}{\log_b a} .$$

If m and n are integers and $n > 0$, then $b^{m/n} = \sqrt[n]{b^m}$.