

RULES FOR EXPONENTS AND LOGARITHMS

$$\log_b x = n \quad \leftrightarrow \quad b^n = x$$

<i>Exponent Rule</i>	<i>Logarithm Rule</i>
$b^0 = 1$	$\log_b 1 = 0$
$b^1 = b$	$\log_b b = 1$
$b^{(\log_b x)} = x$	$\log_b(b^x) = x$
$b^x \cdot b^y = b^{x+y}$	$\log_b(x \cdot y) = \log_b(x) + \log_b(y)$
$b^x / b^y = b^{x-y}$	$\log_b(x / y) = \log_b x - \log_b y$
$(b^x)^y = b^{x \cdot y}$	$\log_b(x \cdot y) = y \cdot \log_b x$
	$(\log_a b) \cdot (\log_b x) = \log_a x$
	$\log_b x = \log_a x / \log_a b$
	$\log_b a = 1 / \log_a b$

(All rules are for any positive a, b, x, and y.)