

Logarithms – Formula Sheet:

Product Rule:	$\log_a(xy) = \log_a(x) + \log_a(y)$
Quotient Rule:	$\log_a\left(\frac{x}{y}\right) = \log_a(x) - \log_a(y)$
Power Rule:	$\log(x)^n = n \log(x)$
Change of Base Formula:	$\log_a b = \frac{\log_c b}{\log_c a}$
Log to Exponential Form:	$\log_a b = c \Leftrightarrow a^c = b$
Identity Rule:	$\log_a a = 1$
Zero Rule:	$\log(1) = 0$
Logarithm Inverse Property:	$\log_a a^n = n$
Inverse Exponent Property:	$a^{\log_a x} = x$
Base Switch Rule:	$\log_a b = \frac{1}{\log_b a}$
Natural Log of e:	$\ln(e) = 1$
Reciprocal Rules:	$\log_a \frac{1}{b} = -\log_a b$ $\log_{\frac{1}{a}} b = -\log_a b$
Power - Logarithmic Exponent:	$a^{\log_c b} = b^{\log_c a}$
Rule 14:	$\log_{xy}(a) = \frac{1}{\log_a x + \log_a y}$
Rule 15:	$\log_{\frac{x}{y}}(a) = \frac{1}{\log_a x - \log_a y}$
Logarithm of Zero:	$\log(0) = \text{Undefined}$