

LAWS OF LOGARITHMS

1. $\ln(xy) = \ln x + \ln y$
2. $\ln\left(\frac{x}{y}\right) = \ln x - \ln y$
3. $\ln(x^r) = r \ln x$

LAWS OF EXPONENTS

1. $e^{x+y} = e^x e^y$
2. $e^{x-y} = \frac{e^x}{e^y}$
3. $(e^x)^r = e^{rx}$

LAWS OF GENERAL EXPONENTS

1. $a^{x+y} = a^x a^y$
2. $a^{x-y} = \frac{a^x}{a^y}$
3. $(a^x)^y = a^{xy}$
4. $(ab)^x = a^x b^x$