

## 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 NATURAL 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.  $(ab)^x = a^x b^x$