

Properties of Logarithms

Assume  $x > 0$ ,  $y > 0$ ,  $b > 0$ ,  $b \neq 1$ , and  $r$  is a real number.

1.  $\log_b x^r = r \log_b x$  (sections 4.2, 4.3)

2.  $b^{\log_b x} = x$  (section 4.2)

3.  $\ln e = 1$  (sections 4.2, 4.3)

4.  $\log_b xy = \log_b x + \log_b y$  (section 4.3)

5.  $\log_b \frac{x}{y} = \log_b x - \log_b y$  (section 4.3)

6.  $\log_b x = \frac{\log x}{\log b}$  or  $\frac{\ln x}{\ln b}$  (section 4.3 - Change of Base Formula)