Logarithms

Definition

$\log_b a = c \iff b^c = a$

Example

$\log_5 125 = 3 \iff 5^3 = 125$

Log Properties

$$\log_b b = 1 \qquad\qquad \log_b 1 = 0$$

$$\log_b b^x = x \qquad\qquad b^{\log_b x} = x$$

$$\log_b (x^r) = r \log_b x$$

$$\log_b (xy) = \log_b x + \log_b y$$

$$\log_b \left(\tfrac{x}{y}\right) = \log_b x - \log_b y$$

Special Logarithms

natural log $\iff \ln x = \log_e x$

common log $\iff \log x = \log_{10} x$