Logarithm

Logarithm is a mathematical operation that is the inverse of the exponent or power

Basic

 $\log_{base} argument = exponent$

$$(\log_{base} x = y) = (base^y = x)$$

$$\begin{aligned} \{b \mid b \in \mathbb{R}, \ b > 0, b \neq 1\} \\ \{x \mid x \in \mathbb{R}, \ x > 0\} \end{aligned}$$

$$\log_e x = \ln x$$

In common logarithm base is 10, In natural logarithm base is e

natural number (e) = 2.718281828459

log Rules

$$\log_b 1 = 0$$

$$\log_b b = 1$$

$$\log_b(b^k) = k$$

$$_{b}\log_{b}k=k$$

$$\log_b x = rac{\log_b x}{\log_b b}$$

$$\log_b(x) + \log\left(y\right) = \log_b(xy)$$

$$\log_b(x) - \log{(y)} = \log_b(\frac{x}{y})$$

$$\log_b(a)^2 = 2\log_b(a)$$

$$\log x - \log y + \log z - \log r = \log rac{xz}{yr}$$

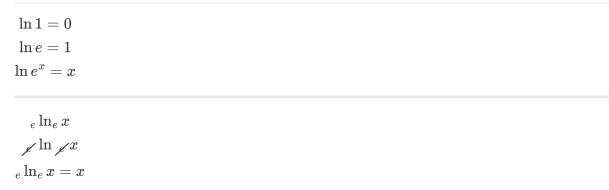
$$2\log x-3\log y+4\log z-5\log r=\lograc{x^2z^4}{y^3r^5}$$

$$\log_b x = n$$

$$\log_b \frac{1}{r} = -n$$

if base is larger than x, change n to 1/n

In Rules



Reference

https://youtu.be/LRbi_pMX1DM

https://www.chilimath.com/wp-content/uploads/2020/03/log-rules.gif

https://www.wikipedia.org