Log Properties

Product

$$\log_b mn = \log_b m + \log_b n$$

Quotient

$$\log_b \frac{m}{n} = \log_b m - \log_b n$$

Power

$$\log_b m^n = n \log_b m$$

Exp Prop

Product

$$x^m x^n = x^{m+n}$$

Quotient

$$\frac{x^m}{x^n} = x^{m-n}$$

Power

$$(x^m)^n = x^{mn}$$

$\log 7 - 2\log 12$

$\log 7 - \log 12^2$

$\log \frac{7}{12^2}$ Condensing

$\log 7 = \log_{10} 7$

No base assume it is 10

$\log(6 \cdot 11)$

$\downarrow$ Expanding

$\log 6 + \log 11$

$\log(3 \cdot 2)$

Solving for Different Bases

$15^{3x} = 285$

#1) Take the Log of both sides

$\log 15^{3x} = \log 285$

#2) Use the Log Properties to isolate X

$\frac{3x \log 15}{3} = \frac{\log 285}{3}$

$\frac{x \cancel{\log 15}}{\cancel{\log 15}} = \frac{\log 285}{3 \log 15}$

$x = \frac{\log 285}{3 \log 15}$ 0.6957

$\log(285) \div 3 \div \log(15)$

$\log 285 \div 3 \log(15)$

$\log_{285}$