

Logarithmic Properties



Properties of Logarithms



$$\log_b (\overset{\text{Product}}{mn}) = \log_b \overset{\text{add}}{m} + \log_b n$$

$$\log_b \left(\frac{m}{n} \right) = \log_b m - \log_b n$$

$$\log_b m^p = p \log_b m$$

Simplify: $\log_8 12 - \log_8 4$

Condense:

$$\log_8 \frac{12}{4}$$
$$\log_8 3$$



Simplify:

$$\log_b u + \log_b v - \log_b uw$$

$$\log_b uv - \log_b uw$$

$$\log_b \frac{uv}{uw}$$



Simplify:

$$\log_4 18 - \log_4 6$$



Simplify:

$$\log_b 2a - \log_b b + \log_b bc$$

$$\log_b \frac{2a}{b} + \log_b bc$$

$$\log_b \left(\frac{2a}{b} \right) \left(\frac{bc}{1} \right)$$

$$\log_b 2ac$$



Simplify:

$$\log 4x - \log 3y + \log y$$

$$\log \frac{4x}{3y} + \log y$$

$$\log \left(\frac{4x}{3y} \right) \left(\frac{y}{1} \right)$$

$$\log \frac{4x}{3}$$



Simplify:

$$\log xy + \log 2x + \log y$$



Simplify:

$$3 \log_4 x - 2 \log_4 y$$

$$\log_4 x^3 - \log_4 y^2$$

$$\log_4 \frac{x^3}{y^2}$$



Simplify:

$$7\log_3 y - \frac{1}{2}\log_3 x$$

$$\frac{1}{2}\log_3 x$$

$$\frac{1}{2}\log_3 x$$

$$\log_3 x^{\frac{1}{2}} = \log_3 \sqrt{x}$$

HW
9-24

