

Name _____ Date _____

Properties of Logs

Notes: Lesson 4

Exponent Rule	Property	Example
$a^m \cdot a^n = a^{m+n}$	Product Property	
$\frac{a^m}{a^n} = a^{m-n}$	Quotient Property	
$(a^m)^n = a^{m \cdot n}$	Power Property	

Example 1... Write each logarithmic expression as a single logarithm (condense).

a. $\log 7 + \log 2$

b. $\log_2 12 - \log_2 3$

c. $\log_3 8 - 2\log_3 6 + \log_3 3$

d. $\ln 5 - x \ln 2$

Example 2... Expand each logarithm.

a. $\log_8 x^3 y^5$

b. $\log 8\sqrt{x}$

c. $\ln (7x)^3$

d. $\log_m 25x^4$

Example 3... Use the properties of logs to evaluate each expression.

a. $3\log_2 2 - \log_2 4$

b. $\log_3 3 + 5\log_3 3$

c. $6\ln e$

Example 4... Assume that $\log 3 \approx 0.4771$, $\log 4 \approx 0.6021$, $\log 5 \approx 0.6990$. Use the properties of logarithms to evaluate each expression. Do NOT use a calculator.

a. $\log 15$

b. $\log 16$

c. $\log \frac{4}{3}$