

Goals:

- I can simplify and evaluate expressions using the properties of logarithms.
- I can solve logarithmic equations using the properties of logarithms.

CW: Finish any problems that we skip on this WS

Name: _____

Algebra II
Properties of Logarithms

Properties of Logarithms

Property	Example
Product	$\log_2[(5)(6)] = \log_2 5 + \log_2 6$
Quotient	$\log_2 \frac{5}{6} = \log_2 5 - \log_2 6$
Power	$\log_2 6^5 = 5 \log_2 6$

Start	End
Multiplication	Addition
Division	Subtraction
Powers/Exponents	No Powers/Exponents

Example 1: Use the Product Property to Combine Logarithms

a. $\log x + \log 2y + \log 3z$	b. $\log[(3x)(6y)(7z)]$
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Example 2: Use the Product Property to Solve Logs

a. $\log_3 6 + \log_3 x = \log_3 12$	b. $\log_4 a + \log_4 8 = \log_4 24$
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Example 3: Use Quotient Property to Solve Logs

a. $\log_4 3 - \log_4 x = \log_4 27$	b. $\log_4 2x - \log_4 4 = \log_4 5$
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Example 4: Use Power Property to Solve Logs

$$\text{a. } \log_6 0.1 + 2 \log_6 x = \log_6 2 + \log_6 5$$

Example 5: Expand the following Logs

$$\text{a. } \log[37xy^2z]$$

$$\text{b. } \log\left[3x^2yz^4q^{\frac{1}{2}}\right]$$

Example 6: Compress the following Logs

$$\text{a. } \log x + \log y - \log 2 + \log a - 3 \log b$$

$$\text{b. } \log 3x + 4 \log y - 6 \log z + 8 \log a$$