

1. Logarithms are exponents so the exponent rules are very similar to the properties of logarithms. Notice the similarities and fill in the rules below.

Exponent Rules	Logarithm Properties	
$b^x b^y =$	Product Property of Logarithms	$\log_b xy =$
$\frac{b^x}{b^y} =$	Quotient Property of Logarithms	$\log_b \frac{x}{y} =$
$(b^x)^r =$	Power Property of Logarithms	$\log_b x^r =$

2. Write each sum as the logarithm of a single expression

a) $\log_5 2 + \log_5 7$

b) $\log_2 x + \log_2 y$

c) $\log_{10} 5 + \log_{10} 2 + \log_{10} (x^2 + 2)$

3. Write each as the logarithm as the logarithm of a single expression.

a) $\log_5 12 - \log_5 4$

b) $5 \log_2 (2x - 1) - \log_2 x$

c) $\log_{10} 8 + \log_{10} 3 - \log_{10} 2$

4. Use the power property to rewrite each expression.

a) $\log_3 x^5$

b) $5 \log_7 \sqrt[3]{5}$

c) $\log_6 7^{-2}$

5. Write each expression as a sum or difference of multiples of logarithms

a) $\log_2 \frac{7}{3}$

b) $\log_5 \frac{2}{9z}$

c) $\log_b \sqrt{\frac{3}{y}}$