

5.5 Properties of Logarithms

Let b , m , and n be positive numbers such that $b \neq 1$. .		
Product Property		
Quotient Property		
Power Property		

Condense the logarithmic expressions down to one logarithm.

1) $\log 9 + 2 \log 2 - \log 3$

2) $\log_2 x + \log_2 y^5 - 6 \log_2 x$

3) $5 \ln x + \ln y - 3 \ln z$

Expand the logarithmic expressions.

1) $\log(3x^4)$

2) $\log_6 \frac{(5x)^3}{y}$

3) $\ln \left(\frac{4x}{y} \right)^3$

Use $\log_4 3 = 0.792$ and $\log_4 7 = 1.404$ to evaluate the logarithms below.

a) $\log_4 \left(\frac{3}{7} \right)$

b) $\log_4 21$

c) $\log_4 49$

Solve each logarithmic equation.

1. $\log_8 4 = x$

2. $\log_9 27 = x$

3) $\log(3x - 2) = 2$

4) $\log x + \log(x - 3) = 1$

5) $\log_2(x - 2) + \log_2(x + 1) = 2$

6) $\ln(5x + 4) = \ln(4x + 12)$