

Simplifying Logarithms

$$\text{product property: } \log_b (m \cdot n) = \log_b m + \log_b n$$

$$\text{quotient property: } \log_b \left(\frac{m}{n}\right) = \log_b m - \log_b n$$

$$\text{power property: } \log_b (m^n) = n \cdot \log_b m$$

Simplify.

Example 1: $\log_5 6 + \log_5 8 = \log_5 (6 \cdot 8) = \log_5 48$

Example 2: $\log_7 9 - \log_7 3 = \log_7 \frac{9}{3} = \log_7 3$

Example 3: $\log_{12} 6^3 = 3 \log_{12} 6$

1. $\log_9 4 + \log_9 6$

2. $\log_{12} 12 + \log_{12} 11$

3. $\log_{16} 36 - \log_{16} 12$

4. $\log 3 - \log 2$

5. $\log 14^6$

6. $\log_{20} 10^{16}$

7. $\log_3 16 + \log_2 4$

8. $\log 10 + \log 10$

9. $\log 125$

10. $\log_2 2^4$