18.3 – Properties of Logarithms

For any positive numbers, M, N, and b, $b \neq 1$,	
Product Property	$\log_b MN = \log_b M + \log_b N$
Quotient Property	$\log_b \frac{M}{N} = \log_b M - \log_b N$
Power Property	$\log_b M^x = x \log_b M$

Write each logarithmic expression as a single logarithm.

1. $\log_3 20 - \log_3 4$

2. $\log_5 2 + \log_5 6$

3. $3 \log_{10} x$

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

Expand each logarithmic expression.

5. $\log_5 \frac{x}{y}$

6. $\log 3x^4$