

MAT 171 Homework Section 4.3: Properties of Logarithms

Use the properties of logarithms to expand each logarithmic expression as much as possible. Where possible, evaluate logarithmic expressions without using a calculator.

1) $\log_5(7 * 3)$

2) $\log(1000x)$

3) $\log_7 \frac{7}{x}$

4) $\log_4 \frac{64}{y}$

5) $\ln \frac{e^2}{5}$

6) $\log_b x^3$

7) $\ln(\sqrt[5]{x})$

$$8) \log_b(x^2y)$$

$$9) \log_4 \frac{\sqrt[2]{x}}{64}$$

$$10) \log_b \frac{x^2y}{z^2}$$

$$11) \log \sqrt[3]{\frac{x}{y}}$$

$$12) \log_b \frac{\sqrt[2]{xy^3}}{z^3}$$

Use properties of logarithms to condense each logarithmic expression. Write the expressions as a single logarithm whose coefficient is 1. Where possible, evaluate logarithmic expressions without using a calculator.

13) $\ln x + \ln 7$

14) $\log(2x + 5) - \log x$

15) $2\log_b x + 3\log_b y$

16) $5\ln x - 2\ln y$

17) $3\ln x + 5\ln y - 6\ln z$

18) $\frac{1}{2}(\log_5 x + \log_5 y) - 2\log_5(x + 1)$

Use common logarithms or natural logarithms and a calculator to evaluate to four decimal places.

19) $\log_5 13$

20) $\log_{14} 87.5$