

Name:

Date:

Period:

## Practice Worksheet: Expanding & Condensing Logs

Use Properties of Logs to expand the expression fully. Simplify completely and show all work.

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1]  $\log(xy^3)$

2]  $\log\left(\frac{xy}{10}\right)$

3]  $\log_2\left(\frac{4}{3x^2}\right)$

4]  $\ln(x \cdot \sqrt[3]{e})$

5]  $\ln\sqrt{x^4y}$

6]  $\log_4\left(\frac{(2x)^4}{y}\right)$

7]  $\log\frac{100}{\sqrt{x}\cdot y^4}$

8]  $\log\left(\frac{x-1}{x+1}\right)^2$

Use Properties of Logs to condense the expression fully. Simplify completely and show all work.

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9]  $\log 4 + 3 \log x + \log y$

10]  $3 \log x + \log 2 - \log y - \log 4$

11]  $\log_2 9 - \log_2 y + \frac{1}{2} \log_2 x - \log_2 3$

12]  $2(\ln x + \ln 3) - 3 \ln y$

13]  $\frac{1}{2}(\ln 8x^2 - \ln 4 - 3 \ln x - \ln y)$

14]  $2 \ln(x + 3) + \ln(x - 3) - \ln(x^2 - 9)$