

Name: _____

Date: _____

Homework: Expanding and Condensing Logarithmic Expressions

Completely expand each of the following logarithmic expressions.

1) $\log 2x^3$

2) $\ln \left(\frac{d}{f}\right)^2$

3) $\log_3 27^4$

4) $\ln \sqrt[4]{a^2 + b^2}$

5) $\log \left(\frac{(x+1)(x-5)}{10^x}\right)$

Simplify each expression into one logarithm.

6) $\ln y + \frac{1}{2} \ln x$

7) $2 \log_2 x - \log_2 7$

8) $\log_p q + r \log_p s - t \log_p u$

9) $\frac{1}{3} \ln(x-1)^3 + \frac{1}{2} [\ln x^4 - \ln(x+2)^2]$

10) $2(\log 8 + 5 \log x - 3 \log y)$

11) Is the following equation true or false? Justify your answer.

$$\ln(x^2 - 1) - \ln(x + 1) = \ln(x - 1)$$

12) Is the following equation true or false? Justify your answer.

$$\log(x + y) = \log x + \log y$$

13) Completely simplify the following expression:

$$e^{\ln 2x^3 + \ln 4x^9}$$