Pre-Calc Name _____

Properties of Logarithms Date_____ Per _____

Use the properties of logarithms to write the expression as a sum, difference, and/or constant multiple of logarithms.

1. $\log 5x$

2. $\ln \frac{2}{y}$

3. $\log_2 y^5$

4. $\log x^3 y^5$

5. $\log_3 \frac{a^4 c^2}{b^5 d^8}$

6. $\log \sqrt[4]{\frac{x}{y}}$

7. $\ln \frac{x^4 \sqrt{y}}{z^5}$

8. $\log_b \frac{x^2}{y^2 z^3}$

9. $\ln \sqrt{\frac{x^2}{y^3}}$

Write the expression as the logarithm of a singular quantity.

10. $\ln x + \ln 2$

11. $\log_5 8 - \log_5 t$

12. $\frac{1}{3}\log_3 5x$

13. $3\ln x + 2\ln y - 4\ln z$

14. $2\ln 8 + 5\ln z$

15. $4[\ln z + \ln z] - 2\ln y$

16. $\ln(x-2) - \ln(x+2)$

17. $\ln x - 2[\ln(x+2) + \ln(x-2)]$

18. $4\log(xy) - 3\log(xy)$