

Name: \_\_\_\_\_

Day One

I. Use the properties of logarithms to EXPAND the expression. SHOW YOUR WORK.

1. $\log 5x^2y$	2. $\ln \frac{6}{xz^4}$
3. $\ln 2\sqrt{z}$	4. $\ln \sqrt[4]{\frac{x^3y}{z^2}}$

II. Use the properties of logarithms to CONDENSE the expression. SHOW YOUR WORK.

5. $2\ln 8 - 5\ln x + 3\ln y$	6. $2\log_2(x+4)$
7. $-4\log_6(2x)$	8. $3\log_3 x - 4\log_3 y - 2\log_3 z$

III. Use the properties of logarithms to find the exact value of the logarithmic expression **WITHOUT** the calculator. SHOW YOUR WORK.

13. $\log_6 \sqrt[3]{6}$	14. $\log_5 20 - \log_5 4$	17. $\log_4 8 + \log_4 2 - \log_4 \left(\frac{1}{4}\right)$	16. $\ln e^8 + \ln e^{\frac{1}{2}} - \ln e^{-3}$
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IV. Solve. SHOW YOUR WORK. Round to three decimal places if needed.

19. $2^x - 1 = 8$	20. $\log_x 36 = 2$
21. $e^{4x} = e^{x^2+3}$	22. $6^x + 10 = 47$
23. $2 - 6 \ln x = 10$	24. $\log_x \frac{1}{32} = 5$
25. $5^{2x+3} + 5 = 25$	26. $5 - 7^{x-1} = -4$
27. $\log_x 25 = 2$	28. $7 - 2e^x = 5$
29. $\log_3 27 = x + 6$	30. $\ln \sqrt{x+2} = 0$