

Name _____

Date _____

1. Rewrite as a log: $z^4 = m$	2. Rewrite as a log: $5^m = \frac{1}{625}$
3. Rewrite as an exponential $\log_6 t = -2$	4. Rewrite as an exponential $\log_5 \left(\frac{1}{125} \right) = h$
5. Simplify $5^{\log_5(x-1)}$	6. Simplify $\log_3 9^{4x}$
7. Expand $\log_5 7x y^3$	8. Expand $\log_2 \frac{k^3 p}{\sqrt{f}}$
9. Expand $\log_4 \frac{16d^5}{b^4 c^3}$	10. Expand $\ln y^4 \sqrt[3]{y+2}$
11. Condense $\ln 4 + 3 \ln a + 4 \ln b$	12. Condense $\log_3 b + 2 \log_3 k + 3 \log_3 m - 5 \log_3 w$
13. Condense $4 \ln b - \ln 7 - \ln g - 5 \ln j$	14. Condense $\log_6 2 + \log_6 y - \frac{1}{3} \log_6 (x+3) - 4 \log_6 y$

For #15-16 - Use the properties of logarithms to rewrite the expressions in terms using $\log_3 4 \approx 1.262$ and $\log_3 7 \approx 1.771$

15. $\log_3 16$

16. $\log_3 \frac{4}{7}$

Solve:

17. $2^{x+1} + 11 = 43$

18. $5^{x-2} = \frac{1}{625}$

19. $-3(2^x) = -336$

20. $\log_5(6x+1) = \log_5(3x+16)$

21. $-3e^{4x} - 7 = -40$

22. $12 - 3\ln(2x) = 6$

23. $4\log_3(x-3) - 21 = -9$

24. $\log_6 x + \log_6(x+5) = 2$

25. $e^{2x} - 5e^x - 6 = 0$

26. $\ln(x+5) = \ln(x-1) - \ln(x+1)$