

Name _____

Date _____

1. Rewrite as a log: $5^m = \frac{1}{625}$	2. Rewrite as an exponential $\log_5\left(\frac{1}{125}\right) = h$
3. Simplify $5^{\log_5(x-1)}$	4. Simplify $\log_3 9^{4x}$
5. Expand $\log_5 7x y^3$	6. Expand $\log_2 \frac{k^3 p}{\sqrt{f}}$
7. Expand $\log_4 \frac{16d^5}{b^4 c^3}$	8. Expand $\ln y^4 \sqrt[3]{y+2}$
9. Condense $\ln 4 + 3\ln a + 4\ln b$	10. Condense $\log_3 b + 2\log_3 k + 3\log_3 m - 5\log_3 w$
11. Condense $4\ln b - \ln 7 - \ln g - 5\ln j$	12. 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 $\log_3 7 \approx 1.771$	
13. $\log_3 16$	14. $\log_3 \frac{4}{7}$

Solve: Show work on another sheet of paper if necessary.

15. $2^{x+1} + 11 = 43$

16. $5^{x-2} = \frac{1}{625}$

17. $-3(2^x) = -336$

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

19. $-3e^{4x} - 7 = -40$

20. $12 - 3\ln(2x) = 6$

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

22. $\log_6 x = 2 - \log_6(x+5)$

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

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

25. You purchase a car for \$27,000. The value of the car decreases 10% each year.

a. Write the equation for the car's value in terms of the number of years since the purchase.

b. What is the value of the car after 4 years?

c. When will the car be worth half the original value?

26. You deposit \$5100 in an account that earns 4.5% annual interest. Find the balance after 10 years if the interest is compounded

a. Semi-Annually

b. Quarterly

c. How long would it take to double your investment if it is compounded continuously?