

Exponential and Logarithm Review Worksheet

Name _____

Work all problems on another sheet of paper and show all of your work.

1. If a person invests \$310 in an account that pays 8% interest compounded annually, find the balance after 5 years.
2. Find the value of \$1000 deposited for 10 years in an account paying 6% annual interest compounded monthly.
3. Write an exponential function to model the situation. Then estimate the value of the function after 5 years (to the nearest whole number).
A population of 390 animals decreases at an annual rate of 9%.
4. A piece of equipment costs \$85,000 new, but depreciates 15% per year in each succeeding year. Find its value after 10 years.
5. If there are initially 2000 bacteria in a culture, and the number of bacteria doubles each hour, the number of bacteria after t hours can be found using the formula $N = 2000(2^t)$. How many bacteria will be present after 3 hours?

Evaluate:

6. $\log_3 729$
7. $\log_{\frac{1}{5}} 125$
8. $\ln e^3$
9. $\log_6 30$ to three decimal places

Evaluate without a calculator:

10. $\log_2 16$
11. $\log_7 \frac{1}{49}$

Write the equation in exponential form.

Write the equation in logarithmic form.

12. $\log_{243} 729 = \frac{6}{5}$
13. $5^3 = 125$

Solve and check for extraneous solutions when appropriate.

14. Round to the nearest hundredth: $4.85^x = 17$
15. $6^{-0.2x} - 3 = 7$
16. $\log_4(x+3) = -2$
17. $\log_2 x + \log_2(x-2) = 3$
18. $\ln(x+7) = \ln(3x-5)$
19. $7\log_5(x) - 3 = 15$

Use the change of base formula to evaluate the expression. Show all of your work.

20. $\log_4 7$

21. $\log_3 24$

Expand.

22. $\log_2(3x)$

23. $\log 2x^3$

24. $\log_2(\sqrt{x} \cdot y^3)$

25. $\log_4\left(\frac{x^2}{y}\right)$

26. $\log_5 \frac{x^2}{y^3 \sqrt{z}}$

Condense.

27. $2\log x + \log 5$

28. $\log 2 + \frac{1}{2}\log y$

29. $\log_5 - 3\log_5 y$

30. $\frac{1}{2}\log_4 x + 4\log_4 y - 3\log_4 z$

31. $\log_2 x - (2\log_2 y + \log_2 z)$

Find the inverse of the function.

32. $y = \log_5 x$

33. $y = \log_{\frac{1}{5}} x$

34. $y = \log \frac{x}{2}$

35. $y = \log_6(x+2)$

36. $y = \log_3 9x$

Graph the following and state the domain and range.

37. $f(x) = \log_2(x+1)$

38. $f(x) = 3^x$

39. $f(x) = 4\left(\frac{1}{4}\right)^x$

40. $f(x) = 3^{x-2} - 1$

41. $f(x) = \log_4 x$

42. $f(x) = \log_6(x+2) + 1$