

Chapter 3 - Exponential and Logarithmic Functions Review for Quiz

Using the One-to-One Property In Exercises 17–20, use the One-to-One Property to solve the equation for x .

17. $(\frac{1}{3})^{x-3} = 9$

18. $3^{x+3} = \frac{1}{81}$

19. $e^{3x-5} = e^7$

20. $e^{8-2x} = e^{-3}$

For n compoundings per year: $A = P\left(1 + \frac{r}{n}\right)^{nt}$

For continuous compounding: $A = Pe^{rt}$

Compound Interest In Exercises 31 and 32, complete the table to determine the balance A for P dollars invested at rate r for t years and compounded n times per year.

n	1	2	4	12	365	Continuous
A						

31. $P = \$5000$, $r = 3\%$, $t = 10$ years

3.2 Writing a Logarithmic Equation In Exercises 33–36, write the exponential equation in logarithmic form. For example, the logarithmic form of $2^3 = 8$ is $\log_2 8 = 3$.

33. $3^3 = 27$

34. $25^{3/2} = 125$

35. $e^{0.8} = 2.2255 \dots$

36. $e^0 = 1$

Evaluating a Logarithmic Function In Exercises 37–40, evaluate the function at the indicated value of x without using a calculator.

37. $f(x) = \log x$, $x = 1000$

38. $g(x) = \log_9 x$, $x = 3$

39. $g(x) = \log_2 x$, $x = \frac{1}{4}$

40. $f(x) = \log_3 x$, $x = \frac{1}{81}$

Using the One-to-One Property In Exercises 41–44, use the One-to-One Property to solve the equation for x .

41. $\log_4(x + 7) = \log_4 14$

42. $\log_8(3x - 10) = \log_8 5$

43. $\ln(x + 9) = \ln 4$

44. $\ln(2x - 1) = \ln 11$

3.3 Using the Change-of-Base Formula In Exercises 59–62, evaluate the logarithm using the change-of-base formula (a) with common logarithms and (b) with natural logarithms. Round your results to three decimal places.

59. $\log_2 6$

60. $\log_{12} 200$

61. $\log_{1/2} 5$

62. $\log_3 0.28$

Expanding a Logarithmic Expression In Exercises 67–72, use the properties of logarithms to expand the expression as a sum, difference, and/or constant multiple of logarithms. (Assume all variables are positive.)

67. $\log_5 5x^2$

68. $\log 7x^4$

69. $\log_3 \frac{9}{\sqrt{x}}$

70. $\log_7 \frac{\sqrt[3]{x}}{14}$

71. $\ln x^2y^2z$

72. $\ln\left(\frac{y-1}{4}\right)^2, y > 1$

Condensing a Logarithmic Expression In Exercises 73–78, condense the expression to the logarithm of a single quantity.

73. $\log_2 5 + \log_2 x$

74. $\log_6 y - 2 \log_6 z$

75. $\ln x - \frac{1}{4} \ln y$

76. $3 \ln x + 2 \ln(x + 1)$

77. $\frac{1}{2} \log_3 x - 2 \log_3(y + 8)$

78. $5 \ln(x - 2) - \ln(x + 2) - 3 \ln x$