7-5 Practice

Form G

Exponential and Logarithmic Equations

Solve each equation.

1. $8^{2x} = 32$

3. $9^{2x} = 27$

5. $36^{-2x+1} = 216$

Solve each equation. Round answers to the nearest hundredth.

7. $5^{2x} = 20$

9. $4^{n-2} = 3$

11. $15^{2n-3} = 245$

Solve by graphing. Round to the nearest hundredth.

13. $2^{n+5} = 120$

15. $8^x = 58$

17. $10^{3y} = 5$

19. $5^x = 4$

21. $3^{x+5} = 15$

Use a table to solve each equation. Round to the nearest hundredth.

23. $12^{2n-1} = 64$

25. $10^x = 182$

27. $10^{2x} = 9$

29. $10^{n-2} = 0.3$

31. The equation $y = 281(1.01)^x$ is a model for the population of the United States y, in millions of people, x years after the year 2000. Estimate when the United States population will reach 400 million people.

Solve each equation. Check your answers.

33. $\log 4x = -1$

35. $\log 4x = 2$

37. $8 \log x = 16$

39. $\log (2x + 5) = 3$

41. $\log (x - 25) = 2$

43. $3 \log (1 - 2x) = 6$

7-5

Practice (continued) *Form G*

Exponential and Logarithmic Equations

Solve each equation.

45. $\log x - \log 4 = -2$

47. $\log 3x - \log 5 = 1$ **49.** $\log 8 - \log 2x = -1$

51. $2 \log x - \log 5 = -2$

53. The function $y = 1000(1.005)^x$ models the value of \$1000 deposited at an interest rate of 6% per year (0.005 per month) x months after the money is deposited.
   a. Use a graph (on your graphing calculator) to predict how many months it will be until the account is worth \$1100.
   b. Predict how many years it will be until the account is worth \$5000.

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55. Suppose you deposit \$2500 in a savings account that pays you 5% interest per year.
   a. How many years will it take for you to double your money?
   b. How many years will it take for your account to reach \$8,000?

Mental Math Solve each equation.

57. $4^x = 64$

59. $\log 81 = x$ **61.** $\log 1,000,000 = x$

Use the properties of exponential and logarithmic functions to solve each system. Check your answers.

63. $\begin{cases} 3^{2x-y} = 1 \\ 4^{x+y} - 8 = 0 \end{cases}$