16-2 **Practice**

Exponential and Logarithmic Equations

Solve each equation.

1. $8^{2x} = 32$ **2.** $7^{n} = 343$ **3.** $9^{2x} = 27$

4. $25^{2n+1} = 625$ **5.** $36^{-2x+1} = 216$ **6.** $64^{x} = 4096$

Solve each equation. Round answers to the nearest hundredth.

7. $5^{2x} = 20$ **8.** $8^{n+1} = 3$ **9.** $4^{n-2} = 3$

10. $4^{3n} = 5$ **11.** $15^{2n-3} = 245$ **12.** $4^{x} - 5 = 12$

Solve each equation. Check your answers. Write your answers as a fraction.

13. $\log x = 2$ **14.** $\log 4x = -1$ **15.** $\log 3x = 2$

16. $\log 4x = 2$ **17.** $4 \log x = 4$ **18.** $8 \log x = 16$

19. $\log x - \log 4 = 3$ **20.** $\log x - \log 4 = -2$ **21.** $2 \log x - \log 4 = 2$

22. $\log 3x - \log 5 = 1$ **23.** $2 \log x - \log 3 = 1$ **24.** $\log 8 - \log 2x = -1$

25. 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.

26. 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.

27. Suppose the population of a country is currently 8,100,000. Studies show this country's population is increasing 2% each year.
    a. What exponential function would be a good model for this country's population?
    b. Using the equation you found in part (a), how many years will it take for the country's population to reach 9 million? Round your answer to the nearest hundredth.

28. 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?