## 9-2 Practice

### Logarithms and Logarithmic Functions

**Write each equation in logarithmic form.**

**1.** $5^3 = 125$

**2.** $7^0 = 1$

**3.** $3^4 = 81$

**4.** $3^{-4} = \frac{1}{81}$

**5.** $\left(\frac{1}{4}\right)^3 = \frac{1}{64}$

**6.** $7776^{\frac{1}{5}} = 6$

**Write each equation in exponential form.**

**7.** $\log_6 216 = 3$

**8.** $\log_2 64 = 6$

**9.** $\log_3 \frac{1}{81} = -4$

**10.** $\log_{10} 0.00001 = -5$

**11.** $\log_{25} 5 = \frac{1}{2}$

**12.** $\log_{32} 8 = \frac{3}{5}$

**Evaluate each expression.**

**13.** $\log_3 81$

**14.** $\log_{10} 0.0001$

**15.** $\log_2 \frac{1}{16}$

**16.** $\log_{\frac{1}{3}} 27$

**17.** $\log_9 1$

**18.** $\log_8 4$

**19.** $\log_7 \frac{1}{49}$

**20.** $\log_6 6^4$

**21.** $\log_3 \frac{1}{3}$

**22.** $\log_4 \frac{1}{256}$

**23.** $\log_9 9^{(n+1)}$

**24.** $2^{\log_2 32}$

**Solve each equation or inequality. Check your solutions.**

**25.** $\log_{10} n = -3$

**26.** $\log_4 x > 3$

**27.** $\log_4 x = \frac{3}{2}$

**28.** $\log_{\frac{1}{5}} x = -3$

**29.** $\log_7 q < 0$

**30.** $\log_6 (2y + 8) \geq 2$

**31.** $\log_y 16 = -4$

**32.** $\log_n \frac{1}{8} = -3$

**33.** $\log_b 1024 = 5$

**34.** $\log_8 (3x + 7) < \log_8 (7x + 4)$ **35.** $\log_7 (8x + 20) = \log_7 (x + 6)$ **36.** $\log_3 (x^2 - 2) = \log_3 x$

**37. SOUND** An equation for loudness, in decibels, is $L = 10 \log_{10} R$, where $R$ is the relative intensity of the sound. Sounds that reach levels of 120 decibels or more are painful to humans. What is the relative intensity of 120 decibels?

**38. INVESTING** Maria invests $1000 in a savings account that pays 4% interest compounded annually. The value of the account $A$ at the end of five years can be determined from the equation $\log A = \log[1000(1 + 0.04)^5]$. Find the value of $A$ to the nearest dollar.

Lesson 9-2

*Glencoe Algebra 2*