Name: Date:
Instructor: Section:

Practice Set 9.6

Use the choices to fill in each blank.

0	positive	extraneous	b
1	negative	exponential	$\log b$

1. It is necessary to check logarithmic equations for _____ roots.

2. Some logarithmic equations can be solved by expressing the equation in _____ form.

3. Logs of _____ numbers do not exist.

4. If $\log a = \log b$, then $a =$ _____.

Solve each exponential equation without using a calculator.

5. $4^x = 256$ **6.** $3^x = 243$ **5.**_____ **6.**_____

7. $7^{-x} = \frac{1}{343}$ **8.** $8^x = \frac{1}{2}$ **7.**_____ **8.**_____

9. $5^{x+1} = 125$ **10.** $3^{x-3} = 27$ **9.** _____ **10.**_____

Use a calculator to solve each equation as needed. Round irrational answers to the nearest hundredth.

11. $6^x = 49$ **12.** $9^{x-1} = 124.6$ **11.**_____ **12.**_____

13. $\log_{49} x = \frac{1}{2}$ **14.** $\log_{216} x = \frac{1}{3}$ **13.**_____ **14.**_____

15. $\log_3 x = -3$ **16.** $\log x = 3$ **15.**_____ **16.** _____

17. $\log_2 (4 - 3x) = 4$ **18.** $\log (x + 5) = 2$ **17.**_____ **18.**_____

19. $\log x + \log (2x + 3) = \log 2$ **20.** $\log (x + 2) - \log x = \log (x + 2)$ **19.**_____ **20.**_____

21. $\log 5 + \log x = 2$ **22.** $\log (x + 3) + \log x = 1$ **21.**_____ **22.**_____

Problem Solving

23. If the initial number of bacteria in a culture is 3000 and the number of bacteria doubles each hour, the number of bacteria after t hours can be found by the formula $N = 3000\,(2)^t$. How long will it take to grow to 27,000 bacteria? **23.**_____

24. Measured on the Richter scale, the magnitude, R, of an earthquake of intensity I is defined by $R = \log I$, where I is the number of times more intense the earthquake is than the minimum level of activity. The 1906 San Francisco earthquake measured 8.3 on the Richter scale. The 1971 San Fernando earthquake measured 6.6 on the Richter scale. How many times more intense was the San Francisco earthquake than the San Fernando earthquake? [Source: *The World Almanac and Book of Facts*] **24.**_____

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