11-4

Practice

Logarithmic Functions

Write each equation in exponential form.

1. $\log_3 81 = 4$

2. $\log_8 2 = \frac{1}{3}$

3. $\log_{10} \frac{1}{100} = -2$

Write each equation in logarithmic form.

4. $3^3 = 27$

5. $5^{-3} = \frac{1}{125}$

6. $\left(\frac{1}{4}\right)^{-4} = 256$

Evaluate each expression.

7. $\log_7 7^3$

8. $\log_{10} 0.001$

9. $\log_8 4096$

10. $\log_4 32$

11. $\log_3 1$

12. $\log_6 \frac{1}{216}$

Solve each equation.

13. $\log_x 64 = 3$

14. $\log_4 0.25 = x$

15. $\log_4 (2x - 1) = \log_4 16$

16. $\log_{10} \sqrt{10} = x$

17. $\log_7 56 - \log_7 x = \log_7 4$

18. $\log_5 (x + 4) + \log_5 x = \log_5 12$

19. ***Chemistry*** How long would it take 100,000 grams of radioactive iodine, which has a half-life of 60 days, to decay to 25,000 grams? Use the formula $N = N_0\left(\frac{1}{2}\right)^t$, where N is the final amount of the substance, N_0 is the initial amount, and t represents the number of half-lives.