

# 7-3 Practice

## Logarithms and Logarithmic Functions

Write each equation in exponential form.

1.  $\log_6 216 = 3$      $6^3 = 216$

2.  $\log_2 64 = 6$      $2^6 = 64$

3.  $\log_3 \frac{1}{81} = -4$      $3^{-4} = \frac{1}{81}$

4.  $\log_{10} 0.00001 = -5$   
 $10^{-5} = 0.00001$

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

6.  $\log_{32} 8 = \frac{3}{5}$   
 $32^{\frac{3}{5}} = 8$

Write each equation in logarithmic form.

7.  $5^3 = 125$      $\log_5 125 = 3$

8.  $7^0 = 1$      $\log_7 1 = 0$

9.  $3^4 = 81$      $\log_3 81 = 4$

10.  $3^{-4} = \frac{1}{81}$      $\log_3 \frac{1}{81} = -4$

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

12.  $7776^{\frac{1}{5}} = 6$      $\log_{7776} 6 = \frac{1}{5}$

Evaluate each expression.

13.  $\log_3 81$     **4**

14.  $\log_{10} 0.0001$     **-4**

15.  $\log_2 \frac{1}{16}$     **-4**

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

17.  $\log_9 1$     **0**

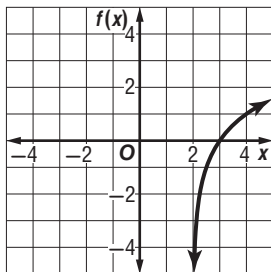
18.  $\log_8 4$      **$\frac{2}{3}$**

19.  $\log_7 \frac{1}{49}$     **-2**

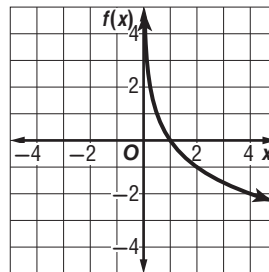
20.  $\log_6 6^4$     **4**

Graph each function.

21.  $f(x) = \log_2(x - 2)$



22.  $f(x) = -2 \log_4 x$



**23. 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?     **$10^{12}$**

**24. 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  $\log_{10} A = \log_{10} [1000(1 + 0.04)^5]$ . Write this equation in exponential form.

**$A = 1000(1 + 0.04)^5$**