**7-3 Practice**

***Logarithms and Logarithmic Functions***

**Write each equation in exponential form.**

**1.**  216 = 3 **2.**  64 = 6 **3.**  = –4

**4.**  0.00001 = –5 **5.**  5 = **6.**  8 =

**Write each equation in logarithmic form.**

**7.**  = 125 **8.**  = 1 **9.**  = 81

**10.**  = **11.**  = **12.**  = 6

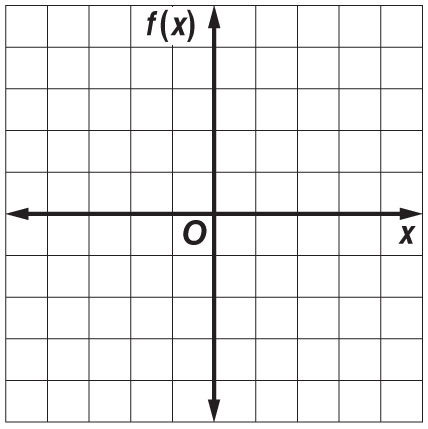
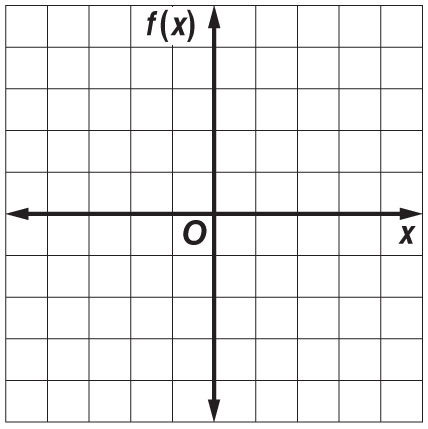
**Evaluate each expression.**

**13.**  81 **14.**  0.0001 **15.**  **16.**  27

**17.**  1 **18.**  4 **19.**  **20.**

**Graph each function.**

**21.** *f*(*x*) = (*x* – 2) **22.** *f*(*x*) = –2 *x*



**23. SOUND** An equation for loudness, in decibels, is *L* = 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?

**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 *A* = [1000]. Write this equation in exponential form.

**7-3 Word Problem Practice**

***Logarithms and Logarithmic Functions***

**1. CHEMISTRY** The pH of a solution is found by the formula pH = – log *H*, where *H* stands for the hydrogen ion concentration in the formula. What is the pH of a solution to the nearest hundredth when   
*H* is 1356?

**2. FIND THE ERROR** Michio wanted to find the value of *x* in the equation = 34. He first converted the equation to 2*x* = 17. Next he wrote 2*x* = and used a calculator to find *x* = 64,570,081. Was his answer correct? If not, what was his mistake and what is the right answer?

**3. SOUND** The decibel level *L* of a sound is determined by the formula *L* = 10 . Find *I* in terms of *M* for a noise with a decibel level of 120.

**4. EARTHQUAKES** The intensity of an earthquake can be measured on the Richter scale using the formula   
*y* = , where *y* is the absolute intensity of the earthquake and *R* is its Richter scale measurement.

|  |  |
| --- | --- |
| **Richter Scale Number** | **Absolute Intensity** |
| 1 | 1 |
| 2 | 10 |
| 3 | 100 |
| 4 | 1000 |
| 5 | 10,000 |

An earthquake in San Francisco in 1906 had an absolute intensity of 6,000,000. What was that earthquake’s measurement on the Richter scale?

**5. GAMES** Julio and Natalia decided to play a game in which they each selected a logarithmic function and compare their functions to see which gave larger values. Julio selected the function *f* (*x*) = 10 *x* and Natalia selected the function 2 *x*.

**a.** Which of the functions has a larger value when

*x* = 7?

**b.** Which of their functions has a larger value when

*x* = 1?

**c.** Do you think the base or the multiplier is more important in determining the value of a logarithmic function?