Name _____ Date _____ Class _____

LESSON 15-1

# Defining and Evaluating a Logarithmic Function

## *Practice and Problem Solving: A/B*

**Write each exponential equation in logarithmic form.**

1. $3^7 = 2187$ _____
2. $12^2 = 144$ _____
3. $5^3 = 125$ _____

**Write each logarithmic equation in exponential form.**

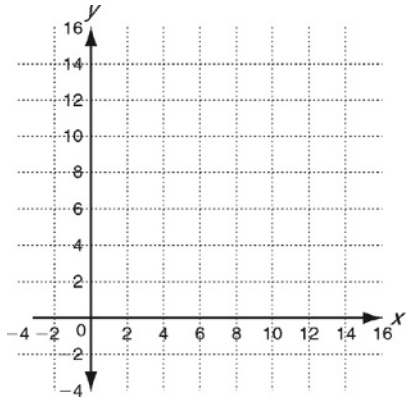
4. $\log_{10} 100{,}000 = 5$ _____
5. $\log_4 1024 = 5$ _____
6. $\log_9 729 = 3$ _____

**Evaluate each expression without using a calculator.**

7. log 1,000,000 _____
8. log 10 _____
9. log 1 _____
10. $\log_4 16$ _____
11. $\log_8 1$ _____
12. $\log_5 625$ _____

**Use the given *x*-values to graph each function. Then graph its inverse. Write an equation for the inverse function and describe its domain and range.**

13. $f(x) = 2^x$; $x = -2, -1, 0, 1, 2, 3, 4$

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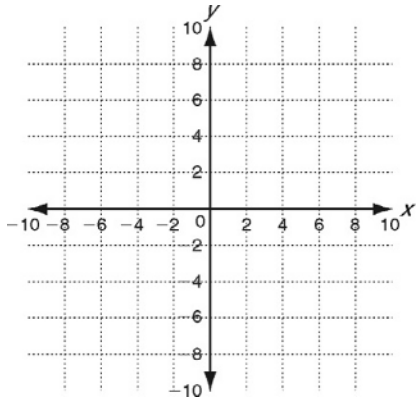
14. $f(x) = \left(\frac{1}{2}\right)^x$; $x = -3, -2, -1, 0, 1, 2, 3$

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**Solve.**

15. The acidity level, or pH, of a liquid is given by the formula $\text{pH} = \log \frac{1}{[H^+]}$, where $[H^+]$ is the concentration (in moles per liter) of hydrogen ions in the liquid. The hydrogen ion concentration in moles per liter for a certain brand of tomato vegetable juice is 0.000316.

    a. Write a logarithmic equation for the pH of the juice. _____

    b. What is the pH of the juice? _____

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