

**Chapter 7 Chapter Test**

Form G

**Do you know HOW?**

Solve each equation.

1.  $8 - 3^x = -1$

2.  $\log_3 81 = x$

3.  $\log x - \log 3 = 2$

4. You put \$2000 into an account earning 4% interest compounded continuously. Find the amount in the account at the end of 8 years.

Describe how the graph of each function is related to the graph of its parent function.

5.  $y = -2^x + 1$

6.  $y = 3^{x-4}$

7.  $y = 5^{x+1} - 2$

Evaluate each logarithm.

8.  $\log_5 125$

9.  $\log_{\frac{1}{2}} \frac{1}{4}$

10.  $\log_3 729$

11.  $\log_9 \frac{1}{3}$

12.  $\log_{\frac{1}{4}} 16$

13.  $\log_8 \frac{1}{256}$

Write each equation in logarithmic form.

14.  $7^3 = 343$

15.  $\left(\frac{2}{3}\right)^{-3} = \frac{27}{8}$

16.  $2^{-4} = 0.0625$

Write each logarithmic expression as a single logarithm.

17.  $\log 2 - 3 \log 1$

18.  $\log a - \log ab$

19.  $\frac{1}{3}(\log_4 x + \log_4 z)$

**Chapter 7 Chapter Test** (continued)

Form G

Use the Change of Base Formula to rewrite each expression using common logarithms.

20.  $\log_4 12$

21.  $\log_2 5$

22.  $\log_8 14$

23. A parent increases a child's allowance by 15% each year. If the allowance is \$3 now, when will it reach \$15?

24. A scientist notes that the number of bacteria in a colony is 50. Two hours later, she notes that the number of bacteria has increased to 80. If this rate of growth continues, how much more time will it take for the number of bacteria to reach 100?

Graph each function.

25.  $y = -3^x + 1$

26.  $y = \log_5 x$

27.  $y = \log(x+1)$

Do you UNDERSTAND?

28. **Writing** Describe the effect of different values of  $a$  on the function  $y = ab^x$ .

29. **Vocabulary** State which property or properties need to be used to write each expression as a single logarithm.

a.  $\log_6 16 - \log_6 4$

b.  $2\log_2 3 + \log_2 4$

30. **Reasoning** Identify each function as *linear*, *quadratic*, or *exponential*. Explain your reasoning.

a.  $y = 4(2)^x$

b.  $y = 6(x)^2 + 1$

31. **Writing** Explain the difference between exponential growth and exponential decay.