Name _____ Date _____

LESSON 7.5

Practice

For use with pages 507–514

Match the expression with the logarithm that has the same value.

1. $\log \sqrt{2} + \log \sqrt{8}$ **2.** $\log 4 - \log 10$ **3.** $2 \log 4 - \log 2$ **4.** $-3 \log \frac{1}{3}$

A. $\log \frac{2}{5}$ **B.** $\log 27$ **C.** $\log 4$ **D.** $\log 8$

Use log 4 ≈ 0.602 and log 7 ≈ 0.845 to evaluate the logarithm.

5. $\log 28$ **6.** $\log \frac{7}{4}$ **7.** $\log 16$

8. $\log 49$ **9.** $\log \frac{1}{4}$ **10.** $\log \frac{49}{64}$

Expand the expression.

11. $\log_3 3x$ **12.** $\log \frac{2x}{5}$ **13.** $\log_7 x^2 y$

14. $\log_2 \frac{x^2}{4}$ **15.** $\ln \sqrt{xy}$ **16.** $\log 5\sqrt[3]{x}$

17. $\ln \frac{1}{2x^2}$ **18.** $\log_9 \frac{2x^3}{3}$ **19.** $\log_6 \frac{xy^2}{\sqrt{z}}$

Name _____ Date _____

LESSON 7.5

Practice *continued*

For use with pages 507–514

Condense the expression.

20. $\log_3 4 + \log_3 2 + \log_3 2$

21. $\log 4 + 3 \log x + \log y$

22. $\log 3 + \frac{1}{2} \log x - \log 5$

23. $2 \ln x - \ln 3 + \ln 6$

24. $3 \log x + \log 4 - \log x - \log 6$

25. $3 \ln(x + 1) - 2 \ln y + \ln y + \ln 2$

Use the change-of-base formula to evaluate the logarithm. Round your result to three decimal places.

26. $\log_7 12$

27. $\log_4 112$

28. $\log_5 1.25$

29. $\log_{2.2} 22$

30. $\log_{4.2} 18.1$

31. $\log_{1/3} 0.0005$

In Exercises 32–34, use the following information.

Henderson-Hasselbach Formula The pH of a patient's blood can be calculated using the Henderson-Hasselbach Formula, $\text{pH} = 6.1 + \log \frac{B}{C}$, where B is the concentration of bicarbonate and C is the concentration of carbonic acid. The normal pH of blood is approximately 7.4.

32. Expand the right side of the formula.

33. Find the pH of blood that has bicarbonate concentration of 38 and carbonic acid concentration of 2.0.

34. Is the pH in Exercise 33 above normal or below normal?