Name _____ Date _____

5.2   Practice A

In Exercises 1–3, rewrite the equation in exponential form.

1. $\log_2 8 = 3$

2. $\log_7 7 = 1$

3. $\log_5 25 = 2$

In Exercises 4–6, rewrite the equation in logarithmic form.

4. $4^2 = 16$

5. $5^0 = 1$

6. $6^{-1} = \dfrac{1}{6}$

In Exercises 7–12, evaluate the logarithm.

7. $\log_2 16$

8. $\log_5 125$

9. $\log_6 6$

10. $\log_5 \dfrac{1}{5}$

11. $\log_9 1$

12. $\log_2 \dfrac{1}{8}$

In Exercises 13–15, evaluate the logarithm using a calculator. Round your answer to three decimal places.

13. $\log 5$

14. $\ln 14$

15. $\log \dfrac{1}{4}$

16. The decibel level D of sound is given by the equation $D = 10 \log\left(\dfrac{I}{10^{-12}}\right)$, where I is the intensity of the sound. What is the decibel level when the intensity of the sound is 10^{-9}?

In Exercises 17–19, simply the expression.

17. $5^{\log_5 x}$

18. $8^{\log_8 2x}$

19. $\log_4 4^{3x}$

In Exercises 20–25, find the inverse of the function.

20. $y = 1.1^x$

21. $y = 3^x$

22. $y = \log_3 x$

23. $y = \log\left(\dfrac{1}{3}x\right)$

24. $y = \ln(3x)$

25. $y = e^{5x}$

26. The wind speed s (in miles per hour) near the center of a tornado can be modeled by $s = 93 \log d + 65$, where d is the distance (in miles) that the tornado travels.

   a. A tornado traveled 35 miles. Estimate the wind speed near the center of the tornado.

   b. The wind speed near the center of a tornado was 150 miles per hour. Find the distance that the tornado traveled.