Practice B

1. $4^2 = 16$ **2.** $3^4 = 81$ **3.** $2^0 = 1$

4. $9^{1/2} = 3$ **5.** $5^{-1} = \frac{1}{5}$ **6.** $2^{-3} = \frac{1}{8}$

7. 0.549 **8.** 1.061 **9.** -0.405 **10.** 3

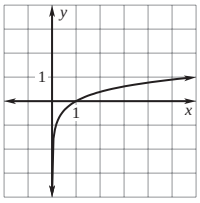
11. 0 **12.** -1 **13.** $\frac{1}{3}$ **14.** $\frac{2}{3}$ **15.** undefined

16. $f^{-1}(x) = 3^x$ **17.** $f^{-1}(x) = e^x$

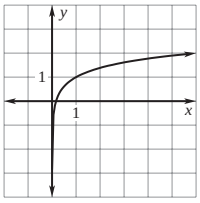
18. $f^{-1}(x) = \left(\frac{1}{3}\right)^x$ **19.** $f^{-1}(x) = \frac{10^x}{2}$

20. $f^{-1}(x) = 2^x + 1$ **21.** $f^{-1}(x) = 4^{x-2}$

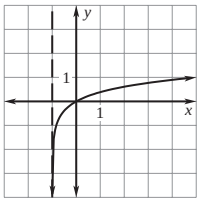
22.



23.



24.



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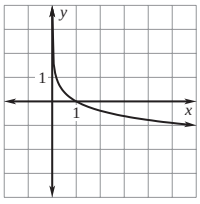
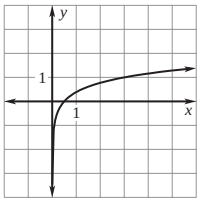
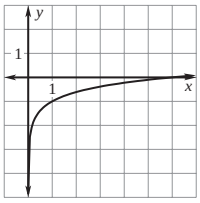


26.



27.



28. $\approx$ 127 strides **29.** $\approx$ 267.4 miles per hour

LESSON 8.4

NAME _____ DATE _____

Practice B

For use with pages 486–492

Rewrite the equation in exponential form.

1. $\log_4 16 = 2$ **2.** $\log_3 81 = 4$ **3.** $\log_2 1 = 0$

4. $\log_9 3 = \frac{1}{2}$ **5.** $\log_5 \frac{1}{5} = -1$ **6.** $\log_2 \frac{1}{8} = -3$

Use a calculator to evaluate the expression. Round the result to three decimal places.

7. $\ln \sqrt{3}$ **8.** $\log 11.5$ **9.** $\ln \left(\frac{2}{3}\right)$

Evaluate the logarithm without using a calculator.

10. $\log_3 27$ **11.** $\log_4 1$ **12.** $\log_2 \frac{1}{2}$

13. $\log_8 2$ **14.** $\log_5 5^{2/3}$ **15.** $\log_6 (-1)$

Find the inverse of the function.

16. $f(x) = \log_3 x$ **17.** $f(x) = \ln x$ **18.** $f(x) = \log_{1/3} x$

19. $f(x) = \log 2x$ **20.** $f(x) = \log_2 (x - 1)$ **21.** $f(x) = \log_4 16x$

Graph the function.

22. $f(x) = \log_6 x$ **23.** $f(x) = 1 + \log_6 x$ **24.** $f(x) = \log_6 (x + 1)$

25. $f(x) = -\log_6 x$ **26.** $f(x) = \log_6 (2x)$ **27.** $f(x) = -1 + \log_6 x$

28. ***Galloping Speed*** Four-legged animals run with two different types of motion: trotting and galloping. An animal that is trotting has at least one foot on the ground at all times. An animal that is galloping has all four feet off the ground at times. The number S of strides per minute at which an animal breaks from a trot to a gallop is related to the animal's weight w (in pounds) by the model

$$S = 256.2 - 47.9 \log w.$$

Approximate the number of strides per minute for a 500 pound horse when it breaks from a trot to a gallop.

29. ***Tornadoes*** The wind speed S (in miles per hour) near the center of a tornado is related to the distance d (in miles) the tornado travels by the model

$$S = 93 \log d + 65.$$

Approximate the wind speed of a tornado that traveled 150 miles.