7 CHAPTER TEST

Graph the function. State the domain and range. 1–9. See margin for art.

3. domain: all real numbers, range: $y < 3$

1. $y = 3^x$ domain: all real numbers, range: $y > 0$
2. $y = 2 \cdot 4^{x-2}$ domain: all real numbers, range: $y > 0$
3. $f(x) = -5 \cdot 2^{x+3} + 3$
4. $y = 4(0.25)^x$ domain: all real numbers, range: $y > 0$
5. $y = 2\left(\frac{1}{3}\right)^{x+2}$ domain: all real numbers, range: $y > 0$
6. $g(x) = \left(\frac{2}{3}\right)^x + 2$ domain: all real numbers, range: $y > 2$
7. $y = \frac{1}{2}e^{-x}$ domain: all real numbers, range: $y > 0$
8. $y = 2.5e^{-0.5x} + 1$ domain: all real numbers, range: $y > 1$
9. $h(x) = \frac{1}{3}e^{x-1} - 2$ domain: all real numbers, range: $y > -2$

Evaluate the logarithm without using a calculator.

10. $\log_5 25$ 2
11. $\log_2 \frac{1}{32}$ −5
12. $\log_6 1$ 0

Graph the function. State the domain and range. 13–15. See margin for art.

13. $y = \log_2 x$ domain: $x > 0$, range: all real numbers
14. $y = \ln x - 3$ domain: $x > 0$, range: all real numbers
15. $f(x) = \log(x + 3) + 2$ domain: $x > -3$, range: all real numbers

Condense the expression.

16. $2 \ln 7 - 3 \ln 4$ $\ln \frac{49}{64}$
17. $\log_4 3 + 5 \log_4 2$ $\log_4 96$
18. $\log 5 + \log x - 2 \log 3$ $\log \frac{5x}{9}$

Use the change-of-base formula to evaluate the logarithm.

19. $\log_5 50$ about 2.431
20. $\log_6 23$ about 1.750
21. $\log_9 45$ about 1.732

Solve the equation. Check for extraneous solutions.

22. $7^{2x} = 30$ about 0.874
23. $3 \log(x - 4) = 6$ 104
24. $\log_4 x + \log_4 (x + 6) = 2$ 2

25. Write an exponential function $y = ab^x$ whose graph passes through $(-1, 48)$ and $(2, 6)$. $y = 24\left(\frac{1}{2}\right)^x$

26. Write a power function $y = ax^b$ whose graph passes through $(3, 8)$ and $(6, 15)$. $y = 2.95x^{0.907}$

27. **LANDSCAPING** From 1996 to 2001, the number of households that purchased lawn and garden products at home gardening centers increased by about 4.85% per year. In 1996, about 62 million households purchased lawn and garden products. Write a function giving the number of households H (in millions) that purchased lawn and garden products t years after 1996. $H = 62(1.0485)^t$

28. **FINANCE** You deposit \$2500 in an account that pays 3.5% annual interest compounded continuously. What is the balance after 8 years? \$3307.82

29. **EARTH SCIENCE** Rivers and streams carry small particles of sediment downstream. The table shows the diameter x (in millimeters) of several particles of sediment and the speed y (in meters per second) of the current needed to carry each particle downstream.

Type of sediment	x	y
Mud	0.2	0.10
Gravel	5	0.50
Coarse gravel	11	0.75
Pebbles	20	1.00
Small stones	45	1.50

   a. Draw a scatter plot of the data pairs $(\ln x, \ln y)$. See margin.

   b. Find a power model for the original data. Estimate the speed of the current needed to carry a particle with a diameter of 120 millimeters downstream. $y = 0.224x^{0.500}$; about 2.45 m/s

Additional Resources

Assessment Book

- Chapter Test, Levels A, B, C, pp. 98–103
- Standardized Chapter Test, pp. 104–105
- SAT/ACT Chapter Test, pp. 106–107
- Alternative Assessment, pp. 108–109

Test Generator CD-ROM

Chapter Test

Easily-readable reduced copies (with answers) of Chapter Test B, the Standardized Chapter Test, and the Alternative Assessment from the Assessment Book can be found on pp. 476E–476F.

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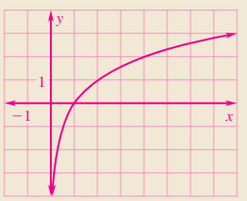

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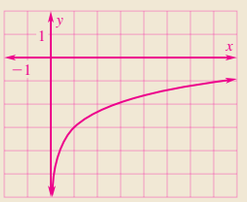

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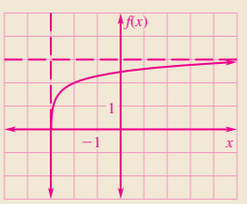

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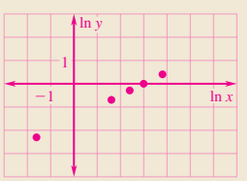

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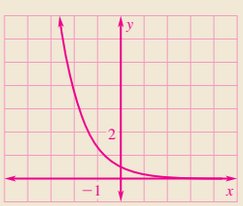

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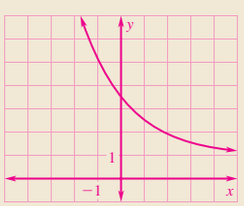

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