

Extra Practice

CHAPTER 1

Evaluate the expression for the given value of the variable. (Lesson 1.1)

- $15a$ when $a = 7$
- $0.75 + x$ when $x = 2.25$
- $y - 14$ when $y = 32$
- $\frac{c}{23}$ when $c = 391$
- $\frac{1578}{d}$ when $d = 3$
- $\frac{3}{4} \cdot z$ when $z = \frac{2}{3}$

Evaluate the expression for the given value(s) of the variable(s). (Lesson 1.2)

- $3y^2$ when $y = 5$
- $(4x)^3$ when $x = 2$
- $6x^4$ when $x = 4$
- $a^4 - 5$ when $a = 3$
- $(x + 2)^3$ when $x = 4$
- $(c - d)^2$ when $c = 10$ and $d = 3$

Evaluate the expression for the given value of the variable. (Lesson 1.3)

- $3a^2 + 8$ when $a = 5$
- $44 - 4c$ when $c = 7$
- $(d^4 - 6) \div 5$ when $d = 3$

Evaluate the expression. (Lesson 1.3)

- $3^3 - 12 \div 4$
- $10^2 \div 4 + 6$
- $10^2 \div (4 + 6)$
- $\frac{9 \cdot 7^2}{5 + 8^2 - 6}$
- $3 + 7(3.5 \div 5)$
- $2 + 21 \div 3 - 6$
- $50 \div (6^2 - 11) - 2$
- $[(5 \cdot 2^3) + 8] \div 16$

Use mental math to solve the equation. (Lesson 1.4)

- $x + 7 = 13$
- $3y = 21$
- $8t - 1 = 23$
- $\frac{m}{4} = 6$

Check whether the given number is a solution of the inequality. (Lesson 1.4)

- $y + 10 < 22$; 12
 - $2n + 5 > 15$; 8
 - $7d > 15 - d$; 2
 - $\frac{c + 1}{2} \leq 3$; 5
 - $b(2b - 5) < 40$; 6
 - $12x > x + 27$; 3
 - $17 - 3t \geq 3$; 4
 - $r(r - 7) \leq 16$; 9
36. Your friend's score in a game is 225. This is 25 more than twice your score. Write an equation to model the situation. What is your score? (Lesson 1.5)

Write the verbal sentence as an equation or an inequality. (Lesson 1.5)

- Thirteen less than the product of 25 and a number n is 37.
- The sum of five and a number y is less than twelve.

39. **WIRELESS INDUSTRY** The table shows the estimated number of cellular telephone subscribers (in millions) in the United States. Make a bar graph and a line graph of the data. (Lesson 1.6)

Year	1993	1994	1995	1996	1997	1998
Subscribers (millions)	16	24	34	44	55	69

► Source: Cellular Telecommunications Industry Association

Make an input-output table for the function. Use 0, 1, 2, and 3 as the domain. Then draw a line graph to represent the data in the table. (Lesson 1.7)

- $y = 8 - 2x$
- $y = 4.5 + x$
- $y = 7x + 1$
- $y = x$

CHAPTER 2

Graph the numbers on a number line. Then write two inequalities that compare the two numbers. (Lesson 2.1)

1. -7 and 8

2. -5.2 and 3.6

3. -2.4 and -2.5

4. $1\frac{2}{3}$ and $1\frac{5}{6}$

Evaluate the expression. (Lesson 2.1)

5. $|8.5|$

6. $|-3|$

7. $|-4| + 3$

8. $7 - |-5|$

Find the sum. (Lesson 2.2)

9. $-3 + 8$

10. $18 + 27$

11. $5 + (-7)$

12. $-4 + (-11)$

13. $-4 + 13 + (-6)$

14. $15 + (-12) + (-4)$

15. $-2 + (-9) + 8$

16. $17 + (-5) + 15$

Evaluate the expression. (Lesson 2.3)

17. $-8 - 5$

18. $4.1 - 6.3$

19. $-3 - (-7)$

20. $-6 + (-3) - 4$

21. $3.6 - 2.4 - (-6.1)$

22. $-15 + 4 - 12$

23. $-11 - (-6) - 7$

24. $\frac{9}{10} - \frac{1}{2} + \left(-\frac{1}{5}\right)$

Find the sum or the difference of the matrices. (Lesson 2.4)

25. $\begin{bmatrix} 8 & -4 \\ 9 & 3 \end{bmatrix} + \begin{bmatrix} -2 & 6 \\ -1 & 5 \end{bmatrix}$

26. $\begin{bmatrix} 3 & -6 \\ 1 & 4 \end{bmatrix} - \begin{bmatrix} 5 & 9 \\ 2 & -2 \end{bmatrix}$

27. $\begin{bmatrix} -6 & 8 & 3 \\ 4 & 2 & 6 \end{bmatrix} + \begin{bmatrix} 3 & -6 & 7 \\ -4 & -5 & 8 \end{bmatrix}$

Simplify the expression. (Lesson 2.5)

28. $(-6)(-7)$

29. $(-5)(9)$

30. $(3)(-8)(-2)$

31. $(-8)(-4x)$

32. $-3(-y)(-y)$

33. $(-c)^3(c)$

34. $(-7)^2(b)(-b)$

35. $-4(-a^4)$

Use the distributive property to rewrite the expression without parentheses. (Lesson 2.6)

36. $6(y + 5)$

37. $4(a - 6)$

38. $(x + 3)(-5)$

39. $-r(r - 5)$

40. $-k(7 + k)$

41. $(x + 4)6x$

42. $s(s - s^2)$

43. $(0.5z - 1.4)6$

Simplify the expression. (Lesson 2.6)

44. $3x + 7x$

45. $5.4m - 2.3m$

46. $82p - (-29p)$

47. $6 - 4t - 4$

48. $5 + 4(x - 2)$

49. $8x^2 + 5 - 2x^2$

50. $2x(7 - x) + 3x^2$

51. $\frac{2}{3}x + \left(-\frac{1}{6}\right)x$

Simplify the expression. (Lesson 2.7)

52. $18 \div (-2)$

53. $-48 \div 12$

54. $16 \div \left(-\frac{4}{5}\right)$

55. $\frac{3x}{8} \div \frac{1}{2}$

56. $21x \div 7$

57. $8x \div \left(-\frac{1}{4}\right)$

58. $-24x \div \left(-\frac{2}{3}\right)$

59. $\frac{-22}{-\frac{1}{3}}$

60. **PROBABILITY** You randomly choose a button from a bag containing 9 yellow, 7 green, 11 blue, and 9 red buttons. What is the probability that you choose a red button? (Lesson 2.8)

Given the probability, find the odds. (Lesson 2.8)

61. The probability of scoring the basket is 0.20.

62. The probability of winning the election is $\frac{1}{3}$.

CHAPTER 3

Solve the equation. (Lesson 3.1)

1. $y - 6 = 8$ 2. $n + 5 = -10$ 3. $a - (-6) = 22$ 4. $14 - r = 3$
5. $|-7| + k = 4$ 6. $\frac{1}{5} + m = -\frac{2}{5}$ 7. $-t - (-3) = 0$ 8. $-b + 3 - 1 = 3 \cdot 4$

Solve the equation. (Lesson 3.2)

9. $7x = 35$ 10. $6a = 3$ 11. $\frac{x}{10} = -2$ 12. $-\frac{3}{8}t = 0$
13. $|-5| = 15b$ 14. $-\frac{7}{8}r = \frac{3}{4}$ 15. $\frac{y}{10} = \frac{-2}{5}$ 16. $-\frac{2}{3} = \frac{1}{9}k$

Solve the equation. (Lesson 3.3)

17. $6x + 8 = 32$ 18. $2x - 1 = 11$ 19. $-x - 5 + 3x = 1$ 20. $4(x - 9) = 8$
21. $\frac{3}{5}x - 7 = 17$ 22. $x = 2(x - 1) + 6$ 23. $\frac{x}{4} = -\frac{x}{2} - 1$ 24. $-5 = \frac{3}{8}(x - 1)$

Solve the equation if possible. (Lesson 3.4)

25. $-6 + 5x = 8x - 9$ 26. $8x + 6 = 3(4 - x)$ 27. $4\left(\frac{1}{2}x + \frac{1}{2}\right) = 2x + 2$
28. $-3(-x - 4) = 2x + 1$ 29. $4x = -2(-2x + 3)$ 30. $-4(x - 3) = 6(x + 5)$

31. **PHOTO FRAMING** A photo measuring 5 inches by 7 inches is placed in a frame that adds a 1-inch border around the photo. Sketch a diagram of the photo and frame. What is the total width and length of the frame? (Lesson 3.5)

Solve the equation. Round the result to the nearest hundredth. (Lesson 3.6)

32. $4x = 82.50$ 33. $-26x - 59 = 135$ 34. $2.3 - 4.8x = 8.2x + 5.6$
35. $18.25x - 4.15 = 2.75x$ 36. $3(3.1x - 4.2) = 6.2x + 3.1$ 37. $8.4x - 3.2 = 4.1(3.4 - 2.1x)$

38. **BICYCLING** If you ride your bike for 2.5 hours and travel 37.5 miles, what is your average speed? (Hint: Solve $d = rt$ for r .) (Lesson 3.7)

Rewrite the equation so that y is a function of x . Then use the result to find y when $x = -2, -1, 0$, and 1 . (Lesson 3.7)

39. $3 - y = x$ 40. $6x - 2y = 10$ 41. $-6x - 1 = -4y + 2$
42. $-2y - 3x - 16 = 0$ 43. $\frac{1}{2}x - \frac{1}{2}y = 6$ 44. $-2(x - 4) = 2(y + 5)$

Find the unit rate. (Lesson 3.8)

45. \$3 for 5 yogurt snacks 46. \$50.75 for working 7 hours 47. Drive 122 miles in 2.5 hours

Convert the measure. Round your answer to the nearest hundredth. (Lesson 3.8)

48. 24 miles to kilometers (1 mile = 1.609 km) 49. 6 fluid ounces to cups (1 cup = 8 fluid ounces)

Find the percent. Round to the nearest whole percent. (Lesson 3.8)

50. Tax of \$1.00 on an item priced at \$19.99 51. 9 field goals made out of 14 attempted
52. \$4.50 tip on a restaurant bill of \$22 53. 127 surveys returned out of 350

CHAPTER 4

Plot and label the ordered pairs in a coordinate plane. (Lesson 4.1)

1. $A(2, 4), B(-2, 0), C(5, -2)$ 2. $A(4, 4), B(0, -2), C(-3, -3)$ 3. $A(4, -4), B(2.5, 5), C(-3, 2)$
 4. $A(0, -1), B(1, -3), C(3, 1)$ 5. $A(-4, -2), B(-2, 4), C(4, 0)$ 6. $A(-3, -4), B(1, -1), C(-1, 1)$

Use a table of values to graph the equation. (Lesson 4.2)

7. $y = 5x + 1$ 8. $y = -2x + 4$ 9. $y = -2$ 10. $4x + y = -8$
 11. $x = 3$ 12. $y = -(6 + x)$ 13. $y = \frac{1}{2}x - 1$ 14. $y = -\frac{1}{3}x - 4$

Find the x -intercept and the y -intercept of the line. Graph the equation. Label the points where the line crosses the axes. (Lesson 4.3)

15. $5x + y = -5$ 16. $2x - y = 6$ 17. $y = 2x - 5$ 18. $6y + 2x = 12$
 19. $14 = y - 2x$ 20. $8x + 2y = -16$ 21. $y = 6 - 3x$ 22. $1.5y = x - 3$

Find the slope of the line passing through the points. (Lesson 4.4)

23. $(6, 1), (-4, 1)$ 24. $(2, 2), (-1, 4)$ 25. $(0, 6), (-3, 0)$ 26. $(4, 5), (2, 2)$
 27. $(-4, 2), (-3, -5)$ 28. $(3, 6), (3, -1)$ 29. $(-1, 0), (0, -1)$ 30. $(-2, -3), (1, -2)$

The variables x and y vary directly. Use the given values to write an equation that relates x and y . (Lesson 4.5)

31. $x = 6, y = 18$ 32. $x = 4, y = 1$ 33. $x = 8, y = -7$ 34. $x = -\frac{1}{2}, y = -10$
 35. $x = -2, y = -2$ 36. $x = 8, y = -4$ 37. $x = 2.5, y = 2$ 38. $x = 2.1, y = -6.3$

39. **EARNINGS** Your earnings vary directly with the number of hours you work. If you earn \$60 for 4 hours of work, how much will you earn for working 35 hours? (Lesson 4.5)

Write the equation in slope-intercept form. Then graph the equation. (Lesson 4.6)

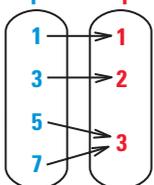
40. $x - y = 1$ 41. $y = 3$ 42. $-3x + 2y = 6$ 43. $y + 4 = 0$
 44. $x = 2y + 1$ 45. $2(x + y + 1) = 4y$ 46. $2x - 4y + 6 = 0$ 47. $5x - 3y + 2 = 14 - 4x$

Solve the equation graphically. Check your solution algebraically. (Lesson 4.7)

48. $6 - 5x = 1$ 49. $2x = -12$ 50. $6x + 8 = 2x$ 51. $8x + 3 = 19$
 52. $\frac{4}{3}x - 2 = -6$ 53. $15 - 2x = 3x$ 54. $\frac{2}{3}x + 5 = -2$ 55. $7x - 4 = -3 + 4x$

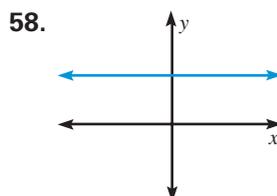
Decide whether the relation is a function. (Lesson 4.8)

56. **Input** **Output**

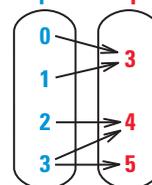


57.

Input	Output
4	-2
0	0
4	2
2	4



59. **Input** **Output**



CHAPTER 5

Write an equation of the line in slope-intercept form. (Lesson 5.1)

- The slope is 2; the y-intercept is 1.
- The slope is -3 ; the y-intercept is -2 .
- The slope is 1; the y-intercept is -3 .
- The slope is -4 ; the y-intercept is 0.

Write an equation of the line that passes through the point and has the given slope. Write the equation in slope-intercept form. (Lesson 5.2)

- $(-1, 0)$, $m = 3$
- $(5, 2)$, $m = -2$
- $(3, 6)$, $m = 0$
- $(-2, 1)$, $m = -5$
- $(-3, -1)$, $m = 4$
- $(1, 5)$, $m = 8$
- $(2, -1)$, $m = \frac{1}{2}$
- $(-4, 3)$, $m = -\frac{1}{3}$

Write an equation in slope-intercept form of the line that passes through the points. (Lesson 5.3)

- $(3, -2)$, $(5, 4)$
- $(2, 17)$, $(-1, -1)$
- $(5, 1)$, $(0, -6)$
- $(-2, -1)$, $(4, -4)$
- $(-1, 7)$, $(5, 7)$
- $(0, 0)$, $(2, 3)$
- $(-3, 5)$, $(-6, 8)$
- $(5, 2)$, $(1, 14)$

Draw a scatter plot for the data. Draw a best-fitting line and write an equation of the line. (Lesson 5.4)

21.

x	-1	0	1	3	4	5
y	0	-1	1	3	2	4

22.

x	2	2.5	3	3	3.5	4
y	2	-1	1	-3	-2	-4

Write the point-slope form of the equation of the line that passes through the point and has the given slope. Then rewrite the equation in slope-intercept form. (Lesson 5.5)

- $(5, 3)$, $m = -2$
- $(3, 7)$, $m = -3$
- $(5, 4)$, $m = 5$
- $(-2, -4)$, $m = \frac{3}{4}$
- $(-3, -5)$, $m = -\frac{5}{3}$
- $(0, 8)$, $m = \frac{1}{4}$
- $(2, 4)$, $m = -\frac{1}{2}$
- $(-1, -7)$, $m = 4$

Write an equation in standard form of the line that passes through the given point and has the given slope, or that passes through the two points. (Lesson 5.6)

- $(5, -2)$, $m = 3$
- $(1, 2)$, $(3, 4)$
- $(-1, 0)$, $(-5, -3)$
- $(-4, 3)$, $m = -\frac{5}{6}$
- $(-3, 7)$, $(1, 7)$
- $(5, 7)$, $m = -\frac{3}{4}$
- $(-2, -5)$, $m = 5$
- $(4, -2)$, $(4, 5)$

WIND CHILL Wind chill is based on the combined effects of temperature and wind speed. The table shows the wind chill for various temperatures (in degrees Fahrenheit) when the wind speed is 5 miles per hour. (Lesson 5.7)

Temperature	35	30	25	20	15	10
Wind chill	32	27	22	16	11	6

- Make a scatter plot of the data.
- Write a linear model for the data.
- Use the linear model to estimate the wind chill at 5° Fahrenheit.

CHAPTER 6

Solve the inequality and graph its solution. (Lesson 6.1)

1. $x + 5 > -4$ 2. $m - 4 < -20$ 3. $3 \geq y - 4$ 4. $9x \geq 36$
5. $\frac{k}{9} \leq 2$ 6. $-5a > 35$ 7. $-\frac{x}{10} < \frac{1}{5}$ 8. $0.5 \leq -\frac{b}{6}$

Solve the inequality. (Lesson 6.2)

9. $0 \leq \frac{1}{2}x + 6$ 10. $\frac{3}{4}x + 5 \leq 8$ 11. $3x + 8 \geq -2x + 3$
12. $-3x - 7 < 2$ 13. $-(x + 5) < -4x - 11$ 14. $-(4 + x) > 2(x - 5)$

Solve the inequality and graph the solution. (Lesson 6.3)

15. $8 \geq x + 4 > 3$ 16. $-36 \leq 6x < 12$ 17. $-15 < -3x < 18$
18. $2x + 1 > 9$ or $3x - 5 < 4$ 19. $x + 1 > 4$ or $2x + 3 \leq 5$ 20. $-4x + 1 \geq 17$ or $5x - 4 > 6$

Solve the equation or the inequality. (Lesson 6.4)

21. $|10 + x| = 4$ 22. $|2x + 3| = 9$ 23. $|x - 4| + 4 = 7$
24. $|6x - 5| + 1 < 8$ 25. $|3x + 4| - 6 \geq 14$ 26. $|10 - 4x| \leq 2$

Sketch the graph of the inequality. (Lesson 6.5)

27. $y \geq -2$ 28. $x - y \leq 0$ 29. $x + y \geq 5$ 30. $4y + x < 4$
31. $x - 3y \leq 0$ 32. $3y - 2x < 6$ 33. $5x - 3y > 9$ 34. $2y - x > 10$

35. PURCHASING SNACKS You have \$20 to spend on snacks for your friends. Each juice drink costs \$2 and each bag of popcorn costs \$1.25. Let x represent the number of drinks. Let y represent the number of bags of popcorn. Write and graph an inequality to model the numbers of juice drinks and popcorn bags you can buy. (Lesson 6.5)

Make a stem-and-leaf plot for the data. (Lesson 6.6)

36. 18, 31, 98, 71, 22, 14, 20, 66, 18, 76, 33, 13 37. 13, 22, 40, 21, 45, 65, 66, 16, 31, 33, 41, 35, 51
38. 3, 22, 41, 5, 63, 8, 17, 24, 60, 64, 39. 44, 19, 51, 2, 46, 8, 39, 41, 38, 39, 56,
6, 55, 78, 91, 13, 32, 54, 72 27, 54, 43, 60, 62, 21, 49, 22, 63

Find the mean, the median, and the mode of the collection of numbers. (Lesson 6.6)

40. 8, 3, 2, 8, 1, 4, 8, 5, 6 41. 13, 15, 17, 13, 11, 13, 9, 17, 4, 8
42. 3.2, 5.4, 2.3, 1.2, 3.2, 5.1, 4.2 43. 123, 151, 121, 112, 146, 112, 138

Find the first, second, and third quartiles of the data. (Lesson 6.7)

44. 8, 6, 7, 4, 9, 7, 5 45. 16, 20, 76, 31, 14, 88, 54
46. 41, 45, 10, 11, 31, 15, 18, 25, 33, 32 47. 19, 72, 93, 82, 22, 21, 14, 31

Draw a box-and-whisker plot of the data. (Lesson 6.7)

48. 6, 14, 8, 13, 5, 11, 9, 18, 3 49. 2, 7, 8, 3, 5, 7, 9, 3
50. 18, 22, 13, 9, 4, 31, 52, 40 51. 1, 8, 21, 12, 5, 2, 9, 10, 4, 15, 3, 23, 31

CHAPTER 7

Graph and check to solve the linear system. (Lesson 7.1)

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

2. $x = 0$
 $y = 3x + 7$

3. $y = \frac{1}{2}x + 5$
 $y = -3x + 5$

4. $5x + 3y = 15$
 $4x - 3y = 12$

5. $y = -2x - 6$
 $y = -4$

6. $x + y = 10$
 $x - y = -2$

7. $-2x + 4y = 12$
 $5x - 2y = 10$

8. $\frac{1}{8}(x + y) = 1$
 $x - y = 4$

Use the substitution method to solve the linear system. (Lesson 7.2)

9. $x = 5y$
 $2x + 3y = -13$

10. $y = -2x$
 $x + y = 7$

11. $x + y = 9$
 $x - y = 3$

12. $2a + 3b = 3$
 $a - 6b = -6$

13. $s - t = 5$
 $3s + 4t = 16$

14. $5x - 8y = -17$
 $3x = 5 + y$

15. $2m + n = 7$
 $4m + 3n = -10$

16. $5a + b = 4$
 $7a + 5b = 11$

Use linear combinations to solve the system of linear equations. (Lesson 7.3)

17. $3x + 3y = 6$
 $2x - 3y = 4$

18. $3x + 7y = -1$
 $7y = -6x$

19. $\frac{2}{5}x - \frac{1}{2}y = 1$
 $\frac{1}{5}x + \frac{1}{2}y = -1$

20. $x + 4y = \frac{9}{2}$
 $\frac{1}{2}(x - y) = 0$

21. $2x + y = 3(x - 5)$
 $x + 5 = 4y + 2x$

22. $2x + 3y = 15$
 $3y + 5x = 12$

23. $y = 2x - 36$
 $3x - 0.5y = 26$

24. $-4x - 15 = 5y$
 $2y = 11 - 5x$

25. **CONCERT TICKETS** You pay \$105 for 8 tickets to attend a folk festival. Tickets for students cost \$10 each and tickets for adults cost \$15 each. How many of each type of ticket did you buy? (Lesson 7.4)

PRINTING T-SHIRTS The tennis team wants to purchase T-shirts for its members. Company A charges a \$20 setup fee and \$8 per shirt. Company B charges a \$10 setup fee and \$10 per shirt. (Lesson 7.4)

26. How many shirts would have to be purchased for the costs to be equal?

27. Which company offers a better price for 12 shirts?

Use any method to solve the linear system and tell how many solutions the system has. (Lesson 7.5)

28. $x + y = 4$
 $2x + 3y = 9$

29. $x + y = 6$
 $3x + 3y = 3$

30. $x + 2y = 5$
 $3x - 15 = -6y$

31. $12x - y = 5$
 $-8x + y = -5$

32. $y = -3x$
 $6y - x = 38$

33. $2x - 3y = 3$
 $6x - 9y = 9$

34. $3x + 6 = 7y$
 $x + 2y = 11$

35. $3x - 8y = 4$
 $6x - 42 = 16y$

Graph the system of linear inequalities. (Lesson 7.6)

36. $y \geq 0$
 $x \leq 0$

37. $y > x + 1$
 $y < x + 3$

38. $x \geq 1$
 $y + x \leq 5$

39. $y + 2 < -x$
 $2y - 4 > 3x$

40. $x < 5$
 $x \geq 1$
 $y \geq -2$
 $y < 7$

41. $y > x - 4$
 $y \geq -x - 1$
 $y \leq 0$

42. $y > x - 3$
 $x - y > -2$
 $x \leq 3$

43. $3x - 1 < 5$
 $-x + y \leq 10$
 $-5x + 2 < 12$

CHAPTER 8

Simplify, if possible. Write your answer as a power or as a product of powers. (Lesson 8.1)

1. $(7^2)(7^3)$

2. $2^3 \cdot 2^4$

3. $(12x)^3$

4. $-(4x)^2 \cdot (5x^3)$

5. $(4r^2s)^2(-2s^2)^3$

6. $(7x^3y) \cdot (-2x^4)$

7. $(3x)^3(-5y)^2$

8. $(-x^3)^2(x)^2(-x^4)^3$

Rewrite the expression with positive exponents. (Lesson 8.2)

9. m^{-4}

10. $\left(\frac{x}{2}\right)^{-2}$

11. $\frac{y}{x^{-2}}$

12. $\frac{6}{(2a)^{-3}}$

13. $\frac{3}{3x^{-4}y^3}$

14. $(-3t)^0 \cdot \frac{2}{s^{-2}}$

15. $6x \cdot \frac{1}{x^{-3}}$

16. $\left(\frac{4b^{-1}}{2a^4}\right)^{-2}$

Graph the exponential function. (Lesson 8.2)

17. $y = 3^{-x}$

18. $y = -2^x$

19. $y = \frac{1}{4} \cdot 2^x$

20. $y = \left(\frac{1}{2}\right)^x$

Simplify the expression. The simplified expression should have no negative exponents. (Lesson 8.3)

21. $\frac{2^{11}}{2^8}$

22. $\frac{6^5}{6^7}$

23. $\left(\frac{3x^2z^4}{2xz}\right)^3$

24. $\frac{(a^3)^5}{(a^4)^5}$

25. $\frac{18b^2c}{4bc^3} \cdot \frac{(3ab)^{-2}}{5a^2c^3}$

26. $\frac{(rst)^{-2}}{rs} \cdot \frac{(t^2)^3}{(s^{-3})^4}$

27. $5^0 \cdot \frac{(5xy)^2}{(x^3y^{-5})^3}$

28. $\left(\frac{3}{8}\right)^{-1} \cdot \frac{(2a^3x^5)^2}{(8a^{-3}x^{-1})^{-3}}$

29. You roll a die three times. What is the probability that you would roll a two each time? (Lesson 8.3)

Rewrite in decimal form. (Lesson 8.4)

30. 4.813×10^{-6}

31. 3.11×10^4

32. 8.4162×10^{-2}

33. 9.43×10^0

34. 5.0645×10^{10}

35. 1.2468×10^{-3}

36. 2.34×10^{-8}

37. 6.09013×10^{10}

Rewrite in scientific notation. (Lesson 8.4)

38. 5280

39. 0.0378

40. 11.38

41. 33,000,000

42. 827.66

43. 0.208054

44. 16.354

45. 0.000891

INTEREST A principal of \$1100 is deposited in an account that pays 5% interest compounded yearly. Find the balance after the given number of years. (Lesson 8.5)

46. 1 year

47. 10 years

48. 15 years

49. 25 years

Classify the model as *exponential growth* or *exponential decay*. Identify the growth or decay factor and the percent of increase or decrease per time period. (Lesson 8.6)

50. $y = 16(0.99)^t$

51. $y = 22(0.5)^t$

52. $y = 8(1.12)^t$

53. $y = 35(1.04)^t$

54. $y = 13\left(\frac{7}{6}\right)^t$

55. $y = 110\left(\frac{2}{3}\right)^t$

56. $y = 4(1.5)^t$

57. $y = 9(0.68)^t$

58. **DEPRECIATION** A piece of equipment originally costs \$120,000. Its value decreases at a rate of 10% per year. Estimate its value after 6 years. (Lesson 8.6)

CHAPTER 9

Evaluate the expression. Give the exact value if possible. Otherwise, approximate to the nearest hundredth. (Lesson 9.1)

1. $-\sqrt{100}$

2. $\pm\sqrt{676}$

3. $-\sqrt{0.25}$

4. $\pm\sqrt{169}$

5. $\sqrt{379}$

6. $-\sqrt{36}$

7. $\sqrt{220}$

8. $\sqrt{0.01}$

Solve the equation or write *no solution*. Write the solutions as integers if possible. Otherwise, write them as radical expressions. (Lesson 9.1)

9. $x^2 = 25$

10. $4x^2 - 8 = 0$

11. $x^2 = -16$

12. $x^2 + 1 = 1$

13. $3x^2 - 48 = 0$

14. $6x^2 + 6 = 4$

15. $2x^2 - 6 = 0$

16. $x^2 - 4 = -3$

17. **FALLING OBJECT** A ball is dropped from a bridge 150 feet above a river. How long will it take for the ball to hit the surface of the water? (Lesson 9.1)

Simplify the expression. (Lesson 9.2)

18. $\sqrt{250}$

19. $6\sqrt{8} \cdot 7\sqrt{2}$

20. $\sqrt{4} \cdot 3\sqrt{2}$

21. $-2\sqrt{6} \cdot 7\sqrt{30}$

22. $\sqrt{\frac{11}{16}}$

23. $\frac{\sqrt{20}}{\sqrt{5}}$

24. $\frac{1}{2}\sqrt{\frac{8}{50}}$

25. $\sqrt{\frac{2}{3}} \cdot \sqrt{\frac{5}{3}}$

Sketch the graph of the function. Label the vertex. (Lesson 9.3)

26. $y = 3x^2$

27. $y = x^2 - 4$

28. $y = -x^2 - 2x$

29. $y = x^2 - 6x + 8$

30. $y = 4x^2 + 4x - 5$

31. $y = x^2 - 2x + 3$

32. $y = -x^2 + 3x + 2$

33. $y = -3x^2 + 12x - 1$

Represent the solution graphically. Check the solutions algebraically. (Lesson 9.4)

34. $x^2 - 6x = -5$

35. $x^2 + 5x = -6$

36. $x^2 - 3x = 4$

37. $\frac{1}{4}x^2 = 9$

38. $x^2 + 3x = 10$

39. $x^2 - 9 = 0$

40. $\frac{1}{2}x^2 + 2x = 6$

41. $-2x^2 + 4x + 6 = 0$

Write the quadratic equation in standard form. Solve using the quadratic formula. (Lesson 9.5)

42. $x^2 + x = 12$

43. $3r^2 + 2 = -8r$

44. $3k^2 + 11k = 4$

45. $-x^2 + 5x = 4$

46. $m^2 - 2m - 4 = -3$

47. $2x^2 - 6x = 5$

48. $b^2 - 8 = 7b$

49. $10 - 2x^2 = -x$

Find the discriminant for the equation. Then tell if the equation has *two solutions*, *one solution*, or *no real solution*. (Lesson 9.6)

50. $3x^2 + 14x - 5 = 0$

51. $4x^2 + 12x + 9 = 0$

52. $x^2 + 10x + 9 = 0$

53. $2x^2 + 8x + 8 = 0$

54. $5x^2 + 125 = 0$

55. $x^2 - 2x + 35 = 0$

56. $2x^2 - x - 3 = 0$

57. $-3x^2 + 5x - 6 = 0$

Sketch the graph of the inequality. (Lesson 9.7)

58. $y > -x^2 + 4$

59. $y \leq 4x^2$

60. $y > 5x^2 + 10x$

61. $y < x^2 + 5x$

62. $y \geq -3x^2 - 6x + 4$

63. $y < x^2 - 4x + 3$

64. $y \leq -x^2 + 4x + 5$

65. $y \geq -x^2 + 8x - 1$

Make a scatter plot of the data. Then name the type of model that best fits the data. (Lesson 9.8)

66. $(-1, -1.5), (2.5, 2), (0.5, 0), (-0.5, -1), (1.5, 1), (-2, -2.5), (0, -0.5)$

67. $(4, 6), (-2, 12), (3, 2), (2, 0), (1, 0), (0, 2), (5, 12), (-1, 6)$

CHAPTER 10

Use a vertical format or a horizontal format to find the sum or the difference. (Lesson 10.1)

1. $(7x^2 - 4) + (x^2 + 5)$ 2. $(3x^2 - 2) - (2x - 6x^2)$ 3. $(8x^2 - 3x + 7) + (6x^2 - 4x + 1)$
4. $(-z^3 + 3z) + (-z^2 - 4z - 6)$ 5. $(5x^2 + 7x - 4) - (4x^2 - 2x)$ 6. $(3a + 2a^4 - 5) - (a^3 + 2a^4 + 5a)$

Find the product. (Lesson 10.2)

7. $x(4x^2 - 8x + 7)$ 8. $-3x(x^2 + 5x - 5)$ 9. $5b^2(3b^3 - 2b^2 + 1)$ 10. $(t + 9)(2t + 1)$
11. $(d - 1)(d + 5)$ 12. $(3z + 4)(5z - 8)$ 13. $(x + 3)(x^2 - 2x + 6)$ 14. $(3 + 2s - s^2)(s - 1)$

Find the product. (Lesson 10.3)

15. $(x + 9)^2$ 16. $(-c - d)^2$ 17. $(a - 2)(a + 2)$ 18. $(-7 + m)(-7 - m)$
19. $(4x + 5)^2$ 20. $(5p - 6q)^2$ 21. $(2a + 3b)(2a - 3b)$ 22. $(10x - 5y)(10x + 5y)$

Solve the factored equation. (Lesson 10.4)

23. $(x + 3)(x + 6) = 0$ 24. $(x - 11)^2 = 0$ 25. $(z - 1)(z + 5) = 0$ 26. $-8(5w - 2)(w + 4) = 0$
27. $(6n - 9)(n - 7) = 0$ 28. $3(x + 2)^2 = 0$ 29. $(2d - 2)(4d - 8) = 0$ 30. $2(3x - 1)(2x + 5) = 0$

Find the x -intercepts and the vertex of the graph of the function. Then sketch the graph of the function. (Lesson 10.4)

31. $y = (x - 8)(x - 6)$ 32. $y = (x + 4)(x - 4)$ 33. $y = (x - 5)(x - 7)$ 34. $y = (x + 1)(x + 6)$
35. $y = (-x + 5)(x - 9)$ 36. $y = (-x + 1)(x + 5)$ 37. $y = (x - 3)(x + 1)$ 38. $y = (-x - 3)(x + 7)$

Solve the equation by factoring. (Lesson 10.5)

39. $x^2 + 6x + 9 = 0$ 40. $x^2 + 2x - 35 = 0$ 41. $x^2 - 12x = -36$ 42. $-x^2 - 4x = 3$
43. $x^2 - 15x = -54$ 44. $-x^2 + 14x = 48$ 45. $x^2 - 2x = 24$ 46. $x^2 - 5x + 4 = 0$

Solve the equation by factoring. (Lesson 10.6)

47. $2x^2 + x - 6 = 0$ 48. $2x^2 + 7x = -3$ 49. $9x^2 + 24x = -16$ 50. $20x^2 + 23x + 6 = 0$
51. $4x^2 - 5x = 6$ 52. $3x^2 - 5 = -14x$ 53. $3x^2 - 17x = 56$ 54. $12x^2 + 46x - 36 = 0$

Factor the expression. Tell which special product factoring pattern you used. (Lesson 10.7)

55. $x^2 - 1$ 56. $9b^2 - 81$ 57. $121 - x^2$ 58. $12 - 27x^2$
59. $t^2 + 2t + 1$ 60. $x^2 + 20x + 100$ 61. $64y^2 + 48y + 9$ 62. $20x^2 - 100x + 125$

Factor the expression completely. (Lesson 10.8)

63. $x^4 - 9x^2$ 64. $m^3 + 11m^2 + 28m$ 65. $x^4 + 4x^3 - 45x^2$ 66. $x^3 + 2x^2 - 4x - 8$
67. $-3y^3 - 15y^2 - 12y$ 68. $x^3 - x^2 + 4x - 4$ 69. $7x^6 - 21x^4$ 70. $8t^3 - 3t^2 + 16t - 6$

71. **GEOMETRY** The width of a box is 4 inches less than the length. The height is 9 inches greater than the length. The box has a volume of 180 cubic inches. What are the dimensions of the box? (Lesson 10.8)

CHAPTER 11

Solve the proportion. Check for extraneous solutions. (Lesson 11.1)

1. $\frac{x}{2} = \frac{8}{x}$
2. $\frac{9}{m} = \frac{15}{10}$
3. $\frac{c^2 - 16}{c + 4} = \frac{c - 4}{3}$
4. $\frac{3}{5} = \frac{x + 2}{6}$
5. $\frac{14}{2} = \frac{7}{n - 5}$
6. $\frac{12}{8} = \frac{5 + t}{t - 3}$
7. $\frac{x + 15}{16} = \frac{-9}{x - 10}$
8. $\frac{x + 30}{-4} = \frac{143}{x - 18}$

Solve the percent problem. (Lesson 11.2)

9. What number is 40% of 60?
10. 75 is what percent of 250?
11. How much is 4% of 525 pounds?
12. 8 is 20% of what number?
13. 35% of 720 is what number?
14. 12% of what amount is \$1482?

Decide if the data in the table show *direct* or *inverse* variation. Write an equation that relates the variables. (Lesson 11.3)

15.

x	0.5	1	2	4
y	4	2	1	0.5

16.

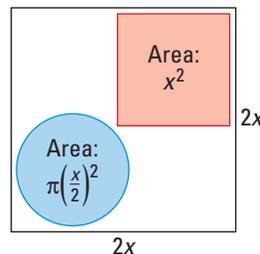
x	0.5	1	2	2.5
y	1.5	3	6	7.5

Simplify the expression if possible. (Lesson 11.4)

17. $\frac{12x^4}{42x}$
18. $\frac{5x^2 - 15x^3}{10x}$
19. $\frac{x + 6}{x^2 + 7x + 6}$
20. $\frac{x^2 - 8x + 15}{x - 3}$

GEOMETRIC PROBABILITY A coin is tossed onto the large square region shown. It is equally likely to land on any point in the region. (Lesson 11.4)

21. Find the probability that the coin lands in the small square.
22. Find the probability that the coin lands in the circle.



Simplify the expression. (Lesson 11.5)

23. $\frac{3x}{5} \cdot \frac{15}{18x}$
24. $\frac{4x^2}{7} \cdot \frac{14}{8x}$
25. $\frac{2x^2}{3x} \cdot \frac{6x^3}{20x^2}$
26. $\frac{x - 3}{5(x + 4)} \cdot \frac{4(x + 4)}{x - 3}$
27. $\frac{1}{4x} \div \frac{6x}{15}$
28. $\frac{10x^2}{x^2 - 25} \cdot (x - 5)$
29. $\frac{5x}{x - 3} \div \frac{x - 8}{x - 3}$
30. $\frac{x^2 + 5x - 36}{x^2 - 81} \div (x^2 - 16)$

Simplify the expression. (Lesson 11.6)

31. $\frac{20}{5x} - \frac{15}{5x}$
32. $\frac{4}{x + 2} + \frac{8}{x + 2}$
33. $\frac{3}{x + 7} - \frac{7}{x - 4}$
34. $\frac{5x + 3}{x^2 - 25} + \frac{5}{x - 5}$
35. $\frac{7}{2x} - \frac{1}{9x^2}$
36. $\frac{3x}{6x^2 + 13x + 2} + \frac{x + 1}{x^2 + 5x + 6}$

Divide. (Lesson 11.7)

37. Divide $14x^3 + 7x^2 + x$ by $7x$.
38. Divide $x^2 + 6x - 16$ by $x + 8$.
39. Divide $12x^2 - 2x - 2$ by $3x + 1$.
40. Divide $2x^3 + 9x^2 - 6x + 2$ by $2x + 1$.

Solve the equation. (Lesson 11.8)

41. $\frac{4}{x - 6} = \frac{x}{10}$
42. $\frac{-2}{3x} = \frac{4 + x}{6}$
43. $\frac{4}{x} + \frac{2}{3} = \frac{6}{x}$
44. $\frac{x}{x - 5} - \frac{11}{x - 5} = 7$
45. $\frac{1}{x - 3} = \frac{5}{x + 9}$
46. $\frac{5}{x - 1} + 1 = \frac{4}{x^2 + 3x - 4}$

CHAPTER 12

Find the domain and the range of the function. Then sketch its graph.

(Lesson 12.1)

1. $y = 8\sqrt{x}$

2. $y = \sqrt{x} - 5$

3. $y = \sqrt{x + 3}$

4. $y = 0.5\sqrt{x}$

5. $y = \sqrt{x - 2}$

6. $y = \sqrt{x} + 1$

7. $y = \sqrt{3x + 2}$

8. $y = \sqrt{4x - 3}$

Simplify the expression. (Lesson 12.2)

9. $3\sqrt{5} + 2\sqrt{5}$

10. $8\sqrt{7} - 15\sqrt{7}$

11. $2\sqrt{8} + 3\sqrt{32}$

12. $\sqrt{20} - \sqrt{45} + \sqrt{80}$

13. $\sqrt{3}(7 - \sqrt{6})$

14. $(4 + \sqrt{10})^2$

15. $\frac{4}{\sqrt{24}}$

16. $\frac{3}{5 - \sqrt{2}}$

Solve the equation. Check for extraneous solutions. (Lesson 12.3)

17. $\sqrt{x} - 11 = 0$

18. $\sqrt{2x - 1} + 4 = 7$

19. $\sqrt{x + 20} = x$

20. $12 = \sqrt{3x + 1} + 7$

21. $\frac{1}{2}x = \sqrt{2x - 3}$

22. $\sqrt{18 - 2x} + 5 = x$

Solve the equation by completing the square. (Lesson 12.4)

23. $x^2 + 10x = 56$

24. $x^2 - 6x + 4 = 20$

25. $x^2 - 7x = -10$

26. $x^2 + x = 3$

27. $5x^2 - 12x - 15 = 0$

28. $3x^2 - 10x - 29 = 0$

Find the missing length of the right triangle if a and b are the lengths of the legs and c is the length of the hypotenuse. (Lesson 12.5)

29. $a = 1, b = 1$

30. $a = 1, c = 2$

31. $b = 6, c = 10$

32. $a = 7, b = 10$

33. $b = 15, c = 25$

34. $a = 30, c = 50$

Find the distance and the midpoint between the two points. Round the distance to the nearest hundredth if necessary. (Lesson 12.6)

35. $(0, 4), (4, 5)$

36. $(-3, 3), (6, -1)$

37. $(1, 0), (4, -4)$

38. $(0, 0), (3, -2)$

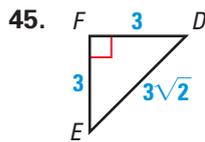
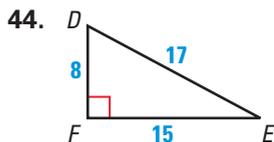
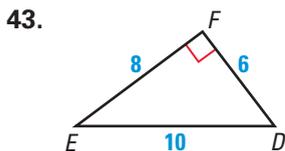
39. $(7, -6), (-1, -6)$

40. $(5, 2), (5, -4)$

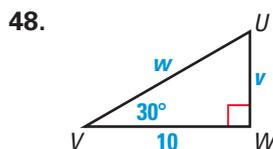
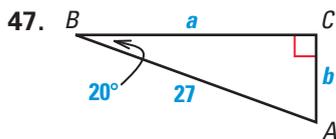
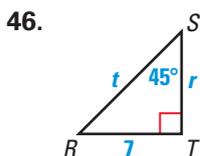
41. $(12, -7), (-4, 2)$

42. $(-4, -5), (-8, -9)$

Find the sine, the cosine, and the tangent of $\angle D$ and $\angle E$. (Lesson 12.7)



Find the lengths of the sides of the triangle. Round your answer to the nearest hundredth. (Lesson 12.7)



49. Find a counterexample to show that the statement is not true.

If $a, b,$ and c are real numbers, then $a \cdot (b \cdot c) = (a \cdot b) \cdot (a \cdot c)$. (Lesson 12.8)