Solve each absolute value equation. See Examples 1 through 7.

1. $|x| = 7$ 7, −7
2. $|y| = 15$ −15, 15
3. $|3x| = 12.6$ 4.2, −4.2
4. $|6n| = 12.6$ 2.1, −2.1
5. $|2x - 5| = 9$ 7, −2
6. $|6 + 2n| = 4$ −5, −1
7. $\left|\frac{x}{2} - 3\right| = 1$ 8, 4
8. $\left|\frac{n}{3} + 2\right| = 4$ −18, 6
9. $|z| + 4 = 9$ 5, −5
10. $|x| + 1 = 3$ 2, −2
11. $|3x| + 5 = 14$ 3, −3
12. $|2x| - 6 = 4$ 5, −5
13. $|2x| = 0$ 0
14. $|7z| = 0$ 0
15. $|4n + 1| + 10 = 4$ ∅
16. $|3z - 2| + 8 = 1$ ∅
17. $|5x - 1| = 0$ $\frac{1}{5}$
18. $|3y + 2| = 0$ $-\frac{2}{3}$
19. Write an absolute value equation representing all numbers x whose distance from 0 is 5 units. $|x| = 5$
20. Write an absolute value equation representing all numbers x whose distance from 0 is 2 units. $|x| = 2$

Solve. See Examples 8 and 9.

21. $|5x - 7| = |3x + 11|$ 9, $-\frac{1}{2}$
22. $|9y + 1| = |6y + 4|$ $-\frac{1}{3}$, 1
23. $|z + 8| = |z - 3|$ $-\frac{5}{2}$
24. $|2x - 5| = |2x + 5|$ 0
25. Describe how solving an absolute value equation such as $|2x - 1| = 3$ is similar to solving an absolute value equation such as $|2x - 1| = |x - 5|$. answers may vary
26. Describe how solving an absolute value equation such as $|2x - 1| = 3$ is different from solving an absolute value equation such as $|2x - 1| = |x - 5|$. answers may vary

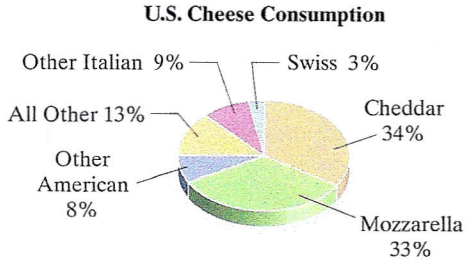
MIXED PRACTICE

Solve each absolute value equation. See Examples 1 through 9.

27. $|x| = 4$ 4, −4
28. $|x| = 1$ −1, 1
29. $|y| = 0$ 0
30. $|y| = 8$ −8, 8
31. $|z| = -2$ ∅
32. $|y| = -9$ ∅
33. $|7 - 3x| = 7$ 0, $\frac{14}{3}$
34. $|4m + 5| = 5$ $-\frac{5}{2}$, 0
35. $|6x| - 1 = 11$ 2, −2
36. $|7z| + 1 = 22$ −3, 3
37. $|4p| = -8$ ∅
38. $|5m| = -10$ ∅
39. $|x - 3| + 3 = 7$ 7, −1
40. $|x + 4| - 4 = 1$ −9, 1
41. $\left|\frac{z}{4} + 5\right| = -7$ ∅
42. $\left|\frac{c}{5} - 1\right| = -2$ ∅
43. $|9v - 3| = -8$ ∅
44. $|1 - 3b| = -7$ ∅
45. $|8n + 1| = 0$ $-\frac{1}{8}$
46. $|5x - 2| = 0$ $\frac{2}{5}$
47. $|1 + 6c| - 7 = -3$ $\frac{1}{2}$, $-\frac{5}{6}$
48. $|2 + 3m| - 9 = -7$ $-\frac{4}{3}$, 0
49. $|5x + 1| = 11$ 2, $-\frac{12}{5}$
50. $|8 - 6c| = 1$ $\frac{7}{6}$, $\frac{3}{2}$
51. $|4x - 2| = |-10|$ 3, −2
52. $|3x + 5| = |-4|$ −3, $-\frac{1}{3}$
53. $|5x + 1| = |4x - 7|$ −8, $\frac{2}{3}$
54. $|3 + 6n| = |4n + 11|$ $-\frac{7}{5}$, 4
55. $|6 + 2x| = -|-7|$ ∅
56. $|4 - 5y| = -|-3|$ ∅
57. $|2x - 6| = |10 - 2x|$ 4
58. $|4n + 5| = |4n + 3|$ −1
59. $\left|\frac{2x - 5}{3}\right| = 7$ 13, −8
60. $\left|\frac{1 + 3n}{4}\right| = 4$ $-\frac{17}{3}$, 5
61. $2 + |5n| = 17$ 3, −3
62. $8 + |4m| = 24$ −4, 4
63. $\left|\frac{2x - 1}{3}\right| = |-5|$ 8, −7
64. $\left|\frac{5x + 2}{2}\right| = |-6|$ $-\frac{14}{5}$, 2
65. $|2y - 3| = |9 - 4y|$ 2, 3
66. $|5z - 1| = |7 - z|$ $-\frac{3}{2}$, $\frac{4}{3}$
67. $\left|\frac{3n + 2}{8}\right| = |-1|$ 2, $-\frac{10}{3}$
68. $\left|\frac{2r - 6}{5}\right| = |-2|$ −2, 8
69. $|x + 4| = |7 - x|$ $\frac{3}{2}$
70. $|8 - y| = |y + 2|$ 3
71. $\left|\frac{8c - 7}{3}\right| = -|-5|$ ∅
72. $\left|\frac{5d + 1}{6}\right| = -|-9|$ ∅
73. Explain why some absolute value equations have two solutions. answers may vary
74. Explain why some absolute value equations have one solution. answers may vary

REVIEW AND PREVIEW

The circle graph shows the U.S. Cheese consumption for 2005. Use this graph to answer Exercises 75–77. See Section 2.2. (Source: National Agriculture Statistics Service, USDA)



75. What percent of cheese consumption came from chedder cheese? 34%
76. A circle contains 360°. Find the number of degrees in the 3% sector for swiss cheese. 10.8°
77. If a family consumed 120 pounds of cheese in 2005, find the amount of mozzarella we might expect they consumed. 39.6 lb

List five integer solutions of each inequality. See Sections 1.2 through 1.4.

78. $|x| \le 3$ answers may vary
79. $|x| \ge -2$ answers may vary
80. $|y| > -10$ answers may vary
81. $|y| < 0$ no solution

CONCEPT EXTENSIONS

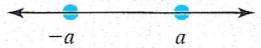
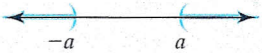
82. Write an absolute value equation representing all numbers x whose distance from 1 is 5 units. $|x - 1| = 5$
83. Write an absolute value equation representing all numbers x whose distance from 7 is 2 units. $|x - 7| = 2$

Write each as an equivalent absolute value.

84. $x = 6$ or $x = -6$ $|x| = 6$
85. $2x - 1 = 4$ or $2x - 1 = -4$ $|2x - 1| = 4$
86. $x - 2 = 3x - 4$ or $x - 2 = -(3x - 4)$ $|x - 2| = |3x - 4|$
87. For what value(s) of c will an absolute value equation of the form $|ax + b| = c$ have
    a. one solution? if $c = 0$
    b. no solution? if c is a negative number
    c. two solutions? if c is a positive number

The following box summarizes the types of absolute value equations and inequalities.

Solving Absolute Value Equations and Inequalities with $a > 0$

Algebraic Solution	Solution Graph
$\lvert X\rvert = a$ is equivalent to $X = a$ or $X = -a$.	
$\lvert X\rvert < a$ is equivalent to $-a < X < a$.	
$\lvert X\rvert > a$ is equivalent to $X < -a$ or $X > a$.	

VOCABULARY & READINESS CHECK

Match each absolute value statement with an equivalent statement.

1. $|2x + 1| = 3$ D
2. $|2x + 1| \le 3$ E
3. $|2x + 1| < 3$ C
4. $|2x + 1| \ge 3$ B
5. $|2x + 1| > 3$ A

A. $2x + 1 > 3$ or $2x + 1 < -3$
B. $2x + 1 \ge 3$ or $2x + 1 \le -3$
C. $-3 < 2x + 1 < 3$
D. $2x + 1 = 3$ or $2x + 1 = -3$
E. $-3 \le 2x + 1 \le 3$

2.7 EXERCISE SET

Solve each inequality. Then graph the solution set and write it in interval notation. See Examples 1 through 4.
1.–64. See graphing answer section.

1. $|x| \le 4$ $[-4, 4]$
2. $|x| < 6$ $(-6, 6)$
3. $|x - 3| < 2$ $(1, 5)$
4. $|y - 7| \le 5$ $[2, 12]$
5. $|x + 3| < 2$ $(-5, -1)$
6. $|x + 4| < 6$ $(-10, 2)$
7. $|2x + 7| \le 13$ $[-10, 3]$
8. $|5x - 3| \le 18$ $\left[-3, \frac{21}{5}\right]$
9. $|x| + 7 \le 12$ $[-5, 5]$
10. $|x| + 6 \le 7$ $[-1, 1]$
11. $|3x - 1| < -5$ $\varnothing$
12. $|8x - 3| < -2$ $\varnothing$
13. $|x - 6| - 7 \le -1$ $[0, 12]$
14. $|z + 2| - 7 < -3$ $(-6, 2)$

Solve each inequality. Graph the solution set and write it in interval notation. See Examples 5 through 7. **17.** $(-\infty, -24] \cup [4, \infty)$

15. $|x| > 3$ $(-\infty, -3) \cup (3, \infty)$
16. $|y| \ge 4$ $(-\infty, -4] \cup [4, \infty)$
17. $|x + 10| \ge 14$
18. $|x - 9| \ge 2$ $(-\infty, 7] \cup [11, \infty)$
19. $|x| + 2 > 6$ $(-\infty, -4) \cup (4, \infty)$
20. $|x| - 1 > 3$ $(-\infty, -4) \cup (4, \infty)$
21. $|5x| > -4$ $(-\infty, \infty)$
22. $|4x - 11| > -1$ $(-\infty, \infty)$
23. $|6x - 8| + 3 > 7$ $\left(-\infty, \frac{2}{3}\right) \cup (2, \infty)$
24. $|10 + 3x| + 1 > 2$ $\left(-\infty, -\frac{11}{3}\right) \cup (-3, \infty)$

Solve each inequality. Graph the solution set and write it in interval notation. See Example 8.

25. $|x| \le 0$ $\{0\}$
26. $|x| \ge 0$ $(-\infty, \infty)$
27. $|8x + 3| > 0$ $\left(-\infty, -\frac{3}{8}\right) \cup \left(-\frac{3}{8}, \infty\right)$
28. $|5x - 6| < 0$ $\varnothing$

MIXED PRACTICE

Solve each inequality. Graph the solution set and write it in interval notation. See Examples 1 through 8. **35.** $(-\infty, 4) \cup (6, \infty)$

29. $|x| \le 2$ $[-2, 2]$
30. $|z| < 8$ $(-8, 8)$
31. $|y| > 1$ $(-\infty, -1) \cup (1, \infty)$
32. $|x| \ge 10$ $(-\infty, -10] \cup [10, \infty)$
33. $|x - 3| < 8$ $(-5, 11)$
34. $|-3 + x| \le 10$ $[-7, 13]$
35. $|0.6x - 3| > 0.6$
36. $|1 + 0.3x| \ge 0.1$ $\left(-\infty, -\frac{11}{3}\right] \cup [-3, \infty)$
37. $5 + |x| \le 2$ $\varnothing$
38. $8 + |x| < 1$ $\varnothing$
39. $|x| > -4$ $(-\infty, \infty)$
40. $|x| \le -7$ $\varnothing$
41. $|2x - 7| \le 11$ $[-2, 9]$
42. $|5x + 2| < 8$ $\left(-2, \frac{6}{5}\right)$
43. $|x + 5| + 2 \ge 8$
44. $|-1 + x| - 6 > 2$
45. $|x| > 0$ $(-\infty, 0) \cup (0, \infty)$
46. $|x| < 0$ $\varnothing$
47. $9 + |x| > 7$ $(-\infty, \infty)$
48. $5 + |x| \ge 4$ $(-\infty, \infty)$
49. $6 + |4x - 1| \le 9$ $\left[-\frac{1}{2}, 1\right]$
50. $-3 + |5x - 2| \le 4$ $\left[-1, \frac{9}{5}\right]$
51. $\left|\frac{2}{3}x + 1\right| > 1$
52. $\left|\frac{3}{4}x - 1\right| \ge 2$
53. $|5x + 3| < -6$ $\varnothing$
54. $|4 + 9x| \ge -6$ $(-\infty, \infty)$
55. $\left|\frac{8x - 3}{4}\right| \le 0$ $\frac{3}{8}$
56. $\left|\frac{5x + 6}{2}\right| \le 0$ $-\frac{6}{5}$
57. $|1 + 3x| + 4 < 5$ $\left(-\frac{2}{3}, 0\right)$
58. $|7x - 3| - 1 \le 10$ $\left[-\frac{8}{7}, 2\right]$
59. $\left|\frac{x + 6}{3}\right| > 2$ $(-\infty, -12) \cup (0, \infty)$
60. $\left|\frac{7 + x}{2}\right| \ge 4$ $(-\infty, -15] \cup [1, \infty)$
61. $-15 + |2x - 7| \le -6$ $[-1, 8]$

43. $(-\infty, -11] \cup [1, \infty)$
44. $(-\infty, -7) \cup (9, \infty)$
51. $(-\infty, -3) \cup (0, \infty)$
52. $\left(-\infty, -\frac{4}{3}\right] \cup [4, \infty)$

62. $-9 + |3 + 4x| < -4$ $\left(-2, \frac{1}{2}\right)$

63. $\left|2x + \frac{3}{4}\right| - 7 \le -2$ $\left[-\frac{23}{8}, \frac{17}{8}\right]$

64. $\left|\frac{3}{5} + 4x\right| - 6 < -1$ $\left(-\frac{7}{5}, \frac{11}{10}\right)$

MIXED PRACTICE

Solve each equation or inequality for x. (Sections 2.6, 2.7)

65. $|2x - 3| < 7$ $(-2, 5)$

66. $|2x - 3| > 7$ $(-\infty, -2) \cup (5, \infty)$

67. $|2x - 3| = 7$ $5, -2$

68. $|5 - 6x| = 29$ $-4, \frac{17}{3}$

69. $|x - 5| \ge 12$ $(-\infty, -7] \cup [17, \infty)$

70. $|x + 4| \ge 20$ $(-\infty, -24] \cup [16, \infty)$

71. $|9 + 4x| = 0$ $-\frac{9}{4}$

72. $|9 + 4x| \ge 0$ $(-\infty, \infty)$

73. $|2x + 1| + 4 < 7$ $(-2, 1)$

74. $8 + |5x - 3| \ge 11$ $(-\infty, 0] \cup \left[\frac{6}{5}, \infty\right)$

75. $|3x - 5| + 4 = 5$ $2, \frac{4}{3}$

76. $|5x - 3| + 2 = 4$ $\frac{1}{5}, 1$

77. $|x + 11| = -1$ $\varnothing$

78. $|4x - 4| = -3$ $\varnothing$

79. $\left|\frac{2x - 1}{3}\right| = 6$ $\frac{19}{2}, -\frac{17}{2}$

80. $\left|\frac{6 - x}{4}\right| = 5$ $-14, 26$

81. $\left|\frac{3x - 5}{6}\right| > 5$ $\left(-\infty, -\frac{25}{3}\right) \cup \left(\frac{35}{3}, \infty\right)$

82. $\left|\frac{4x - 7}{5}\right| < 2$ $\left(-\frac{3}{4}, \frac{17}{4}\right)$

REVIEW AND PREVIEW

Recall the formula:

$$\text{Probability of an event} = \frac{\text{number of ways that the event can occur}}{\text{number of possible outcomes}}$$

Find the probability of rolling each number on a single toss of a die. (Recall that a die is a cube with each of its six sides containing 1, 2, 3, 4, 5, and 6 black dots, respectively.) See Section 2.3.

83. P(rolling a 2) $\frac{1}{6}$

84. P(rolling a 5) $\frac{1}{6}$

85. P(rolling a 7) 0

86. P(rolling a 0) 0

87. P(rolling a 1 or 3) $\frac{1}{3}$

88. P(rolling a 1, 2, 3, 4, 5, or 6) 1

Consider the equation $3x - 4y = 12$. For each value of x or y given, find the corresponding value of the other variable that makes the statement true. See Section 2.3.

89. If $x = 2$, find y -1.5

90. If $y = -1$, find x $\frac{8}{3}$

91. If $y = -3$, find x 0

92. If $x = 4$, find y 0

CONCEPT EXTENSIONS

93. Write an absolute value inequality representing all numbers x whose distance from 0 is less than 7 units. $|x| < 7$

94. Write an absolute value inequality representing all numbers x whose distance from 0 is greater than 4 units. $|x| > 4$

95. Write $-5 \le x \le 5$ as an equivalent inequality containing an absolute value. $|x| \le 5$

96. Write $x > 1$ or $x < -1$ as an equivalent inequality containing an absolute value. $|x| > 1$

97. Describe how solving $|x - 3| = 5$ is different from solving $|x - 3| < 5$. answers may vary

98. Describe how solving $|x + 4| = 0$ is similar to solving $|x + 4| \le 0$. answers may vary

The expression $|x_T - x|$ is defined to be the absolute error in x, where x_T is the true value of a quantity and x is the measured value or value as stored in a computer.

99. If the true value of a quantity is 3.5 and the absolute error must be less than 0.05, find the acceptable measured values. $3.45 < x < 3.55$

100. If the true value of a quantity is 0.2 and the approximate value stored in a computer is $\frac{51}{256}$, find the absolute error. $\frac{1}{1280}$, or 0.00078125

THE BIGGER PICTURE SOLVING EQUATIONS AND INEQUALITIES

We now continue the outline from Sections 2.4 and 2.5. Although suggestions will be given, this outline should be in your own words and you should include at least "how to recognize" and "how to begin to solve" under each letter heading.

For example:

Solving Equations and Inequalities

I. Equations

A. Linear equations (Section 2.1)

B. Absolute Value Equations: Equation contains the absolute value of a variable expression. (Section 2.6)

$|3x - 1| - 12 = -4$ Absolute value equation.

$|3x - 1| = 8$ Isolate absolute value.

$3x - 1 = 8$ or $3x - 1 = -8$

$3x = 9$ or $3x = -7$

$x = 3$ or $x = -\frac{7}{3}$

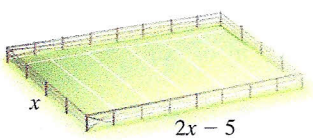
CHAPTER 2 REVIEW

(2.1) Solve each linear equation.

1. $4(x - 5) = 2x - 14$ 3
2. $x + 7 = -2(x + 8)$ $-\frac{23}{3}$
3. $3(2y - 1) = -8(6 + y)$ $-\frac{45}{14}$
4. $-(z + 12) = 5(2z - 1)$ $-\frac{7}{11}$
5. $n - (8 + 4n) = 2(3n - 4)$ 0
6. $4(9v + 2) = 6(1 + 6v) - 10$ $\varnothing$
7. $0.3(x - 2) = 1.2$ 6
8. $1.5 = 0.2(c - 0.3)$ 7.8
9. $-4(2 - 3x) = 2(3x - 4) + 6x$ all real numbers
10. $6(m - 1) + 3(2 - m) = 0$ 0
11. $6 - 3(2g + 4) - 4g = 5(1 - 2g)$ $\varnothing$
12. $20 - 5(p + 1) + 3p = -(2p - 15)$ all real numbers
13. $\frac{x}{3} - 4 = x - 2$ -3
14. $\frac{9}{4}y = \frac{2}{3}y$ 0
15. $\frac{3n}{8} - 1 = 3 + \frac{n}{6}$ $\frac{96}{5}$
16. $\frac{z}{6} + 1 = \frac{z}{2} + 2$ -3
17. $\frac{y}{4} - \frac{y}{2} = -8$ 32
18. $\frac{2x}{3} - \frac{8}{3} = x$ -8
19. $\frac{b - 2}{3} = \frac{b + 2}{5}$ 8
20. $\frac{2t - 1}{3} = \frac{3t + 2}{15}$ 1
21. $\frac{2(t + 1)}{3} = \frac{2(t - 1)}{3}$ $\varnothing$
22. $\frac{3a - 3}{6} = \frac{4a + 1}{15} + 2$ 11

(2.2) Solve.

23. Twice the difference of a number and 3 is the same as 1 added to three times the number. Find the number. -7
24. One number is 5 more than another number. If the sum of the numbers is 285, find the numbers. 140, 145
25. Find 40% of 130. 52
26. Find 1.5% of 8. 0.12
27. In 2000, a record number of music CDs were sold by manufacturers in the United States. By 2005, this number had decreased to 705.4 million music CDs. If this represented a decrease of 25%, find the number of music CDs sold by U.S. manufacturers in 2000. (*Source:* Recording Industry Association of America) 940.5 million
28. Find four consecutive integers such that twice the first subtracted from the sum of the other three integers is 16. 10, 11, 12, 13
29. Determine whether there are two consecutive odd integers such that 5 times the first exceeds 3 times the second by 54. no such integers exist
30. The length of a rectangular playing field is 5 meters less than twice its width. If 230 meters of fencing goes around the field, find the dimensions of the field. width: 40 m; length: 75 m



31. A car rental company charges $19.95 per day for a compact car plus 12 cents per mile for every mile over 100 miles driven per day. If Mr. Woo's bill for 2 days use is $46.86, find how many miles he drove. 258 mi
32. The cost C of producing x number of scientific calculators is given by $C = 4.50x + 3000$ and the revenue R from selling them is given by $R = 16.50x$. Find the number of calculators that must be sold to break even. (Recall that to break even, revenue = cost.) 250 calculators

(2.3) Solve each equation for the specified variable.

33. $V = LWH$ for W $W = \frac{V}{LH}$
34. $C = 2\pi r$ for r $r = \frac{C}{2\pi}$
35. $5x - 4y = -12$ for y $y = \frac{5x + 12}{4}$
36. $5x - 4y = -12$ for x $x = \frac{4y - 12}{5}$
37. $y - y_1 = m(x - x_1)$ for m $m = \frac{y - y_1}{x - x_1}$
38. $y - y_1 = m(x - x_1)$ for x $x = \frac{y - y_1 + mx_1}{m}$
39. $E = I(R + r)$ for r $r = \frac{E - IR}{I}$
40. $S = vt + gt^2$ for g $g = \frac{S - vt}{t^2}$
41. $T = gr + gvt$ for g $g = \frac{T}{r + vt}$
42. $I = Prt + P$ for P $P = \frac{I}{1 + rt}$
43. A principal of $3000 is invested in an account paying an annual percentage rate of 3%. Find the amount (to the nearest cent) in the account after 7 years if the amount is compounded
    a. semiannually. $3695.27
    b. weekly. $3700.81
44. The high temperature in Slidell, Louisiana, one day was 90° Fahrenheit. Convert this temperature to degrees Celsius. $32\frac{2}{9}$°C
45. Angie Applegate has a photograph for which the length is 2 inches longer than the width. If she increases each dimension by 4 inches, the area is increased by 88 square inches. Find the original dimensions. length: 10 in.; width: 8 in.
46. One-square-foot floor tiles come 24 to a package. Find how many packages are needed to cover a rectangular floor 18 feet by 21 feet. 16 packages

(2.4) Solve each linear inequality. Write your answers in interval notation.

47. $3(x - 5) > -(x + 3)$ $(3, \infty)$
48. $-2(x + 7) \geq 3(x + 2)$ $(-\infty, -4]$
49. $4x - (5 + 2x) < 3x - 1$ $(-4, \infty)$
50. $3(x - 8) < 7x + 2(5 - x)$ $(-17, \infty)$
51. $24 \geq 6x - 2(3x - 5) + 2x$ $(-\infty, 7]$
52. $\frac{x}{3} + \frac{1}{2} > \frac{2}{3}$ $\left(\frac{1}{2}, \infty\right)$
53. $x + \frac{3}{4} < -\frac{x}{2} + \frac{9}{4}$ $(-\infty, 1)$
54. $\frac{x - 5}{2} \leq \frac{3}{8}(2x + 6)$ $[-19, \infty)$

Solve.

55. George Boros can pay his housekeeper \$15 per week to do his laundry, or he can have the laundromat do it at a cost of 50 cents per pound for the first 10 pounds and 40 cents for each additional pound. Use an inequality to find the weight at which it is more economical to use the housekeeper than the laundromat. more economical to use housekeeper for more than 35 pounds per week

56. Ceramic firing temperatures usually range from 500° to 1000° Fahrenheit. Use a compound inequality to convert this range to the Celsius scale. Round to the nearest degree. $260° \le C \le 538°$

57. In the Olympic gymnastics competition, Nana must average a score of 9.65 to win the silver medal. Seven of the eight judges have reported scores of 9.5, 9.7, 9.9, 9.7, 9.7, 9.6, and 9.5. Use an inequality to find the minimum score that Nana must receive from the last judge to win the silver medal. 9.6

58. Carol would like to pay cash for a car when she graduates from college and estimates that she can afford a car that costs between \$4000 and \$8000. She has saved \$500 so far and plans to earn the rest of the money by working the next two summers. If Carol plans to save the same amount each summer, use a compound inequality to find the range of money she must save each summer to buy the car. $\$1750 \le x \le \$3750$

(2.5) *Solve each inequality. Write your answers in interval notation.*

59. $1 \le 4x - 7 \le 3$ $\left[2, \frac{5}{2}\right]$

60. $-2 \le 8 + 5x < -1$ $\left[-2, -\frac{9}{5}\right)$

61. $-3 < 4(2x - 1) < 12$ $\left(\frac{1}{8}, 2\right)$

62. $-6 < x - (3 - 4x) < -3$ $\left(-\frac{3}{5}, 0\right)$

63. $\frac{1}{6} < \frac{4x - 3}{3} \le \frac{4}{5}$ $\left(\frac{7}{8}, \frac{27}{20}\right]$

64. $x \le 2$ and $x > -5$ $(-5, 2]$

65. $3x - 5 > 6$ or $-x < -5$ $\left(\frac{11}{3}, \infty\right)$

(2.6) *Solve each absolute value equation.*

66. $|x - 7| = 9$ 16, −2

67. $|8 - x| = 3$ 5, 11

68. $|2x + 9| = 9$ 0, −9

69. $|-3x + 4| = 7$ $-1, \frac{11}{3}$

70. $|3x - 2| + 6 = 10$ $2, -\frac{2}{3}$

71. $5 + |6x + 1| = 5$ $-\frac{1}{6}$

72. $-5 = |4x - 3|$ ∅

73. $|5 - 6x| + 8 = 3$ ∅

74. $-8 = |x - 3| - 10$ 1, 5

75. $\left|\frac{3x - 7}{4}\right| = 2$ $5, -\frac{1}{3}$

76. $|6x + 1| = |15 + 4x|$ $7, -\frac{8}{5}$

(2.7) *Solve each absolute value inequality. Graph the solution set and write it in interval notation.* **77.–84.** See graphing answer section.

77. $|5x - 1| < 9$ $\left(-\frac{8}{5}, 2\right)$

78. $|6 + 4x| \ge 10$ $(-\infty, -4] \cup [1, \infty)$

79. $|3x| - 8 > 1$ $(-\infty, -3) \cup (3, \infty)$

80. $9 + |5x| < 24$ $(-3, 3)$

81. $|6x - 5| \le -1$ ∅

82. $\left|3x + \frac{2}{5}\right| \ge 4$ $\left(-\infty, -\frac{22}{15}\right] \cup \left[\frac{6}{5}, \infty\right)$

83. $\left|\frac{x}{3} + 6\right| - 8 > -5$ $(-\infty, -27) \cup (-9, \infty)$

84. $\left|\frac{4(x - 1)}{7}\right| + 10 < 2$ ∅

MIXED REVIEW

Solve.

85. $\frac{x - 2}{5} + \frac{x + 2}{2} = \frac{x + 4}{3}$ 2

86. $\frac{2z - 3}{4} - \frac{4 - z}{2} = \frac{z + 1}{3}$ $\frac{37}{8}$

87. China, the United States, and France are predicted to be the top tourist destinations by 2020. In this year, the United States is predicted to have 9 million more tourists than France, and China is predicted to have 44 million more tourists than France. If the total number of tourists predicted for these three countries is 332 million, find the number predicted for each country in 2020. China: 137 million; United States: 102 million; France: 93 million

88. $A = \frac{h}{2}(B + b)$ for B $B = \frac{2A - hb}{h}$

89. $V = \frac{1}{3}\pi r^2 h$ for h $h = \frac{3V}{\pi r^2}$

90. Determine which container holds more ice cream, an 8 inch × 5 inch × 3 inch box or a cylinder with radius of 3 inches and height of 6 inches. cylinder holds more ice cream

91. Erasmos Gonzalez left Los Angeles at 11 a.m. and drove nonstop to San Diego, 130 miles away. If he arrived at 1:15 p.m., find his average speed, rounded to the nearest mile per hour. 58 mph

Solve. If an inequality, write your solutions in interval notation.

92. $48 + x \ge 5(2x + 4) - 2x$ $(-\infty, 4]$

93. $\frac{3(x - 2)}{5} > \frac{-5(x - 2)}{3}$ $(2, \infty)$

94. $0 \le \frac{2(3x + 4)}{5} \le 3$ $\left[-\frac{4}{3}, \frac{7}{6}\right]$

95. $x \le 2$ or $x > -5$ $(-\infty, \infty)$

96. $-2x \le 6$ and $-2x + 3 < -7$ $(5, \infty)$

97. $|7x| - 26 = -5$ 3, −3

98. $\left|\frac{9 - 2x}{5}\right| = -3$ ∅

99. $|x - 3| = |7 + 2x|$ $-10, -\frac{4}{3}$

100. $|6x - 5| \ge -1$ $(-\infty, \infty)$

101. $\left|\frac{4x - 3}{5}\right| < 1$ $\left(-\frac{1}{2}, 2\right)$