State what number you would add to each side of the inequality to solve the inequality.

1. $d - 5 \geq -4$
2. $0 < c - 8$
3. $z - 4.3 \geq 1.6$

Solve each inequality. Graph and check your solution.

4. $x - 1 > 10$
5. $t - 3 < -2$
6. $-5 > b - 1$
7. $7 \leq d - 3$
8. $s - 2 \geq -6$
9. $r - 9 \leq 0$
10. $8 < n - 2$
11. $-4 \geq w - 2$
12. $-1 < -4 + d$
13. $y - \frac{1}{2} \leq -5$
14. $-\frac{2}{3} > q - 4$
15. $x - 2 \geq 0.5$
16. $3.2 > -1.3 + r$
17. $-3.4 > m - 1.8$
18. $b - \frac{3}{8} < \frac{1}{8}$
19. $n - 2\frac{1}{2} > \frac{1}{2}$

qualities

Example 3 (page 142)

State what number you would subtract from each side of the inequality to solve the inequality.

20. $w + 2 > -1$ **21.** $8 < \frac{5}{3} + r$ **22.** $5.7 \geq k + 3.1$

Solve each inequality. Graph and check your solution.

23. $w + 4 \leq 9$ **24.** $m + 5 > -3$ **25.** $1 < 8 + b$ **26.** $-2 \geq 4 + a$

27. $r + 1 \geq -5$ **28.** $k + 3 \leq 4$ **29.** $3 > 4 + x$ **30.** $-5 < 1 + p$

31. $\frac{3}{5} + z \geq -\frac{2}{5}$ **32.** $7.5 + y < 13$ **33.** $\frac{1}{2} < m + 2$ **34.** $2.7 \geq a + 3$

35. $-2.9 < 4.1 + p$ **36.** $\frac{1}{4} \geq h + \frac{3}{4}$ **37.** $5.3 + d > 3.8$ **38.** $t + \frac{3}{8} < -\frac{1}{8}$

Example 4 (page 142)

39. Vacation Budget Your brother has $2000 saved for a vacation. His airplane ticket is $637. Write and solve an inequality to find how much he can spend for everything else.

40. Weekly Budget You have an allowance of $15.00 per week. You are in a bowling league that costs $6.50 each week, and you save at least $5.00 each week. Write and solve an inequality to show how much you have left to spend each week.

41. Fund-Raising A school club is selling reflectors for Bicycle Safety Day. Each member is encouraged to sell at least 50 reflectors. You sell 17 on Monday and 12 on Tuesday. How many reflectors do you need to sell on Wednesday to meet your goal?

Apply Your Skills

State what you must do to the first inequality in order to get the second.

42. $36 \leq -4 + y$; $40 \leq y$ **43.** $9 + b > 24$; $b > 15$ **44.** $m - \frac{1}{2} < \frac{3}{8}$; $m < \frac{7}{8}$

Solve each inequality.

45. $w - 3 + 1 \geq 9$ **46.** $\frac{1}{2} + c \leq 3\frac{1}{2}$ **47.** $y - 0.3 < 2.8$

48. $-6 > n - \frac{1}{5}$ **49.** $z + 4.1 < -5.6$ **50.** $-4.1 > y - 0.9$

51. $\frac{2}{3} + t - \frac{5}{6} > 0$ **52.** $5 \leq v - 4 - 7$ **53.** $3.6 + k \geq -4.5$

54. $6 + b - 7 < 5$ **55.** $m + 2.3 \leq -1.2$ **56.** $4 \geq k - \frac{3}{4}$

57. $h - \frac{1}{2} \geq -1$ **58.** $-7.7 \geq x - 2$ **59.** $-2 > 9 + 3 + w$

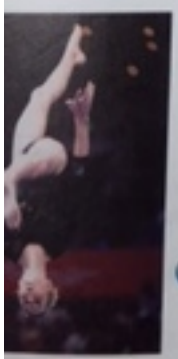
60. $\frac{3}{8} + w \leq \frac{1}{3}$ **61.** $x + 4 - 7 < 13$ **62.** $3.5 < m - 2$

63. $9.4 \leq t - 3.5$ **64.** $0 > k - 2\frac{3}{5}$ **65.** $5.3 > 1.6 + n - 2.3$

66. $-7\frac{3}{4} + m + \frac{1}{2} \leq -2\frac{1}{4}$ **67.** $-1.4 + s + 2.1 > 11$

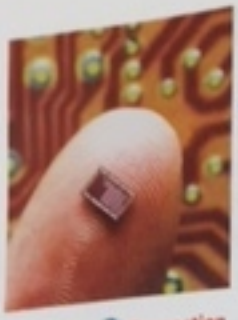
68. a. If $45 + 47 = t$, does $t = 45 + 47$?
b. If $45 + 47 < r$, is $r < 45 + 47$?
c. Discuss the differences between these two examples.

69. Gymnastics Suppose your sister wants to qualify for a regional gymnastics competition. At today's competition she must score at least 34.0 points. She scored 8.8 on the vault, 7.9 on the balance beam, and 8.2 on the uneven parallel bars. The event that remains is the floor exercise.
a. Write and solve an inequality that models the information.
b. Explain what the solution means in terms of the original situation.
c. Open-Ended Write three scores your sister could make that would allow her to qualify for the regional gymnastics competition.



Connection

1,000 athletes
ymnastic
the United States.



Real-World Connection

In 1971, a computer chip could hold 2300 transistors. In 2000, a chip could hold 42,000,000 transistors.

70. Computers Suppose your computer has ... Its basic systems require 12.8 MB. How much memory ... programs and functions?

71. Banking Your local bank offers free checking for accounts with a balance of at least $500. Suppose you have a balance of $516.46 and you write a check for $31.96. How much must you deposit to avoid being charged a service fee?

72. To earn an A in Ms. Orlando's math class, students must score a total of at least 135 points on the three tests. On the first two tests, Amy's scores were 47 and 48. What is the minimum score she must get on the third test in order to earn an A?

73. a. Open-Ended Use each of the inequality symbols $<$, $\leq$, $>$, and $\geq$ to write four addition or subtraction inequalities.

b. Solve each of the inequalities in part (a) and graph your solution.

74. a. Sam says that he can solve $z - 8.6 \geq 5.2$ by replacing z with 13, 14, and 15. When $z = 13$, the inequality is false. When $z = 14$ and $z = 15$, the inequality is true. So Sam says that the solution is $z \geq 14$. Is his reasoning correct? Justify your answer.

b. Critical Thinking Explain why substituting values into the inequality does not guarantee that your solution is correct.

Solve each inequality.

75. $4x + 4 - 3x \geq 5$

76. $-5n - 3 + 6n < 2$

77. $7t - (6t - 2) \leq -1$

78. $5k - 2(2k + 1) > 8$

79. $3(r + 2) - 2r < 4$

80. $4(r + 5) - 3r \geq 7$

81. $3a + 6 - 2a \geq -19$

82. $-5 \leq 3m - 10 - 2m$

83. $-3d + 4(d + 3) > 4$

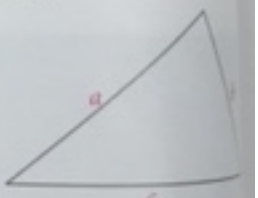
84. $5(y - 2) - 4(y - 1) < 0$

85. $-6(a + 2) + 7a \leq 12$

86. $-2(a - 3) + 3(a + 2) < 4$

87. Geometry The Triangle Inequality Theorem states that the sum of the lengths of any two sides of a triangle is greater than the length of the third side. Following are inequalities for sides of the triangle shown.

$$a + b > c$$
$$b + c > a$$
$$a + c > b$$



a. Write an inequality using $c - b$ and a.

b. Write an inequality using $a - c$ and b.

c. Write an inequality using $b - a$ and c.

d. Writing Write a generalization about the length of the third side and the difference of the lengths of the other two sides.

Challenge

Reasoning **Decide if each inequality is true for all real numbers. If the inequality is *not* true, give a counterexample.**

88. $a - b < a + b$

89. If $a \geq b$, then $a + c \geq b + c$.

90. If $c > d$, then $a - c < a - d$.

91. If $a < b$, then $a < b + c$.

92. Reasoning Find real numbers x, y, z, and w for which it is true that $x > y$ and $z > w$, but it is not true that $x - z > y - w$.