

**Practice**

1. Which inequalities are true?

- a)  $5 > 4$       b)  $10 > 6$       c)  $15 \geq 17$   
 d)  $6 < 8$       e)  $7 \leq -7$       f)  $11 < 13$   
 g)  $-3 > -2$       h)  $-1 > -5$       i)  $-1 \geq -2$   
 j)  $-4 \leq -4$       k)  $-5 < -8$       l)  $-6 < -5$

2. Which of the  $x$  values shown make each inequality true?

- a)  $x + 2 < 8$       (3, 6)      b)  $-5 > x - 2$       (-5, 0)  
 c)  $x + 5 < 7$       (4, 1)      d)  $x - 3 > 3$       (0, 8)  
 e)  $x + 3 \leq 8$       (7, -1)      f)  $x - 5 \geq -9$       (-5, 1)  
 g)  $6 \leq -1 + x$       (-4, 7)      h)  $x + 2 \leq -2$       (-2, -4)

*Solve each inequality and graph its solution.*

3.  $x - 2 > 0$       4.  $10 > x + 5$   
 5.  $x - 3 < 1$       6.  $x - 5 > 2$   
 7.  $y - 4 > -3$       8.  $y + 3 < 4$   
 9.  $1 < -2 + z$       10.  $z - 5 < -2$

*Solve, then check your solution.*

11.  $4x < 8$       12.  $2y > -8$       13.  $4m < 20$   
 14.  $5n < -20$       15.  $3s > 0$       16.  $21 \geq 7y$   
 17.  $6p \leq -12$       18.  $-15 \geq 5t$       19.  $8b \leq 24$

*Solve.*

20.  $-3m < 9$       21.  $-4n > 12$   
 22.  $-15 > -5x$       23.  $-6 > -2y$   
 24.  $-3t \geq -18$       25.  $-10y \leq -50$   
 26.  $21 \geq -7x$       27.  $4x \geq -12$

*Solve. Graph the solution.*

28.  $2x < 10$       29.  $2y > -8$       30.  $-8 > 4m$   
 31.  $2n > 6$       32.  $5t \leq -15$       33.  $4 \leq 4s$   
 34.  $3y \leq -6$       35.  $8x \leq 40$       36.  $2x \geq -2$

*Solve and check.*

37.  $4x + 2 < 3x + 5$       38.  $2x - 4 > x + 2$   
 39.  $7y - 4 \geq 6y + 3$       40.  $5y + 7 \leq 4y - 2$   
 41.  $2t + 7 < t - 1$       42.  $10a + 4 > 9a + 2$   
 43.  $3n + 4 < 2n + 2$       44.  $5n + 2 > 4n - 1$

*Solve.*

45.  $4(x - 3) > 3x + 1$   
 46.  $3y + 9 < 2y + 12$   
 47.  $4(2m - 1) \geq 7m - 3$   
 48.  $3x - 10 > 2x - 9$   
 49.  $3y + 2 \leq 2y + 1$   
 50.  $3m + 14 < 2(m + 6)$   
 51.  $17 - 6x > 12 - 7x$   
 52.  $20m - 7 < 19m - 2$   
 53.  $2(5 - 3b) \geq -7b + 2$   
 54.  $5w - 7 \leq 4w - 3$   
 55.  $7p + 11 \geq 6p + 17$   
 56.  $10x + 10 \leq 9x + 15$   
 57.  $19 - 13x \geq -14x + 16$

Solve. Graph the solution.

58.  $7x + 4 < 5x + 8$     59.  $5y - 2 \leq 2y + 7$

60.  $2m - 3 < 9 - 2m$     61.  $3x + 10 < -2 - 3x$

62.  $4y + 5 \geq 6y - 1$     63.  $6t - 5 \leq 8t + 3$

64.  $7 + y < 4y + 13$     65.  $6x - 13 \geq 8x - 15$

Solve.

66.  $6(y - 2) + 7 > 8y - 25$

67.  $4(t - 1) < 8t + 20$

68.  $8(x - 2) > 8 - 4x$

69.  $24x + 18 > 12 + 7(3x - 3)$

70.  $3(5 - 5x) + 3 \geq 34 - 7x$

71.  $2(7x - 11) \leq 9x - 32$

72.  $15 + 4x \geq 5(2x - 1) - 10$

73.  $2(8x - 13) + 4 < 18x + 26$

74.  $3t + 45 \geq 6(t - 4)$

75.  $6(m - 4) - 2(m + 2) < 7(m - 4) - 6$

76.  $5(y + 1) - 2(y + 3) \leq 5(y - 1)$

77.  $3(2x - 5) \geq 2(1 + 2x) + 5$

### Problems and Applications

78. In her last math test, Giselle got 10 marks more than on any other test this year. Her mark was less than 100. Solve the inequality  $x + 10 < 100$  to find her highest possible mark on any other test.

79. On Saturdays, Campus Clothes sells at least 25 more jackets than on any other day of the week. The store has never sold more than 84 jackets in one day. Solve the inequality  $84 \geq n + 25$  to find the number of jackets that could have been sold on any other day of the week.

80. Matt wants to keep his annual travel expenses under \$4680. Solve the inequality  $52x < 4680$  to find how much Matt can spend each week.

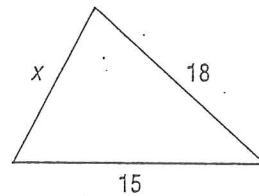
81. Bianca must keep her phone bill below \$55/month. The basic charge is \$15, and it costs her \$2/min to phone her friend in Taiwan. Solve the inequality  $2t + 15 < 55$  to determine how long Bianca can spend talking to her friend each month.

82. A peregrine falcon can dive at up to 350 km/h. This speed is 50 km/h faster than 3 times the top speed of the fastest land animal, the cheetah.

a) Solve the inequality  $350 \geq 3s + 50$  to determine the speed of a cheetah.

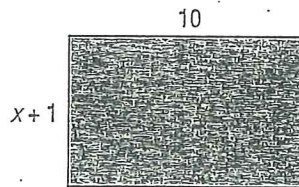
b) Does a cheetah have a minimum speed? Explain.

83. a) Solve the inequality  $x + 15 + 18 \leq 50$  to find the values of  $x$  that give this triangle a perimeter of no more than 50.



b) Does  $x$  have a minimum value? Explain.

84. a) Solve the inequality  $10(x + 1) < 50$  to find values of  $x$  that give this rectangle an area of less than 50.



b) Does  $x$  have a minimum value? Explain.

85. Write an inequality that has variables and numbers on both sides and has a solution of  $x \leq -1$ . Have a classmate solve your inequality.