

CHAPTER 3

Think & Discuss (p. 137)

1., 2.

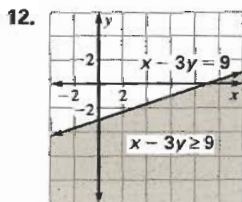
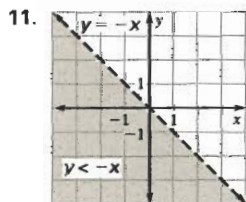
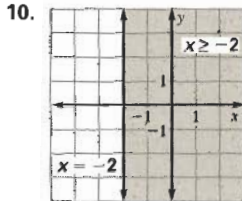
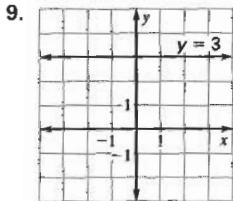
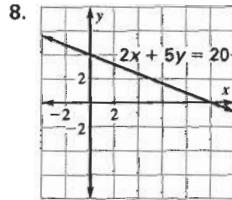
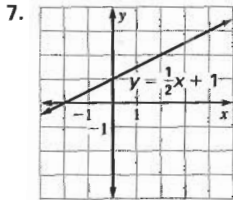
Minutes swimming, s	Minutes inline skating, i	$12s + 8i$
0	30	240
5	25	260
10	20	280
15	15	300
20	10	320
25	5	340
30	0	360

$12s + 8i$ represents Calories burned.

3. Swim for 15 min; skate for 15 min

Study Guide (p. 138)

1. $\frac{2}{3}(0) - 4 \neq -4$; no 2. $-3 = -3$; yes
 3. $5(1) + 5 = 10$; yes 4. $5 \geq 0$; yes
 5. $2(6) - 3(2) > 6$; no 6. $-7 + 9 \leq 3$; yes



Lesson 3.1

3.1 Guided Practice (p. 142)

1. solution

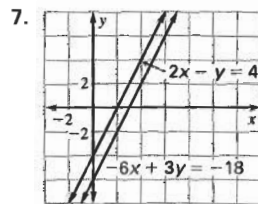
2. *Sample answer:* If the graph consists of two non-parallel lines, then there is a single solution. If the graph consists of two parallel lines, there is no solution. If the graph of two lines coincide, there are infinitely many solutions.

3. *Sample answer:* If two lines share two points in common, they are the same line, and every point on that line is a solution.

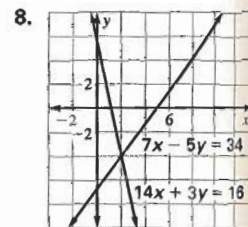
4. $-2(5) + 4(6) \neq -14$; $3(5) + 6 = 21$; no

5. $7(5) - 2(6) = 23$; $-5 + 3(6) = 13$; yes

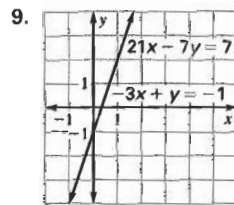
6. $5 + 6 = 11$; $-5 - 6 = -11$; yes



no solution



one solution



infinitely many solutions

10. $8x + 6y = 34$

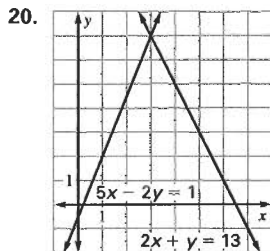
$x + y = 5$

$(2, 3)$

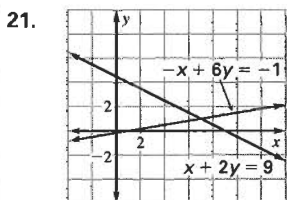
3.1 Practice and Applications (pp. 142-145)

11. $4(6) - (-1) = 25$; $-3(6) - 2(-1) = -16$; yes
 12. $-3 + 2(0) \neq 3$; $10(3) + 0 = 30$; no
 13. $2(-2) - (-8) \neq 52$; $9(-2) - (-8) = -10$; no
 14. $-(-3) - (-5) = 8$; $2(-3) + 5(-5) = -31$; yes
 15. $-4(-4) + 3(1) = 19$; $5(-4) - 7(1) = -27$; yes
 16. $-3(10) - (8) = -38$; $-8(10) + 8(8) = -16$; yes
 17. $-3(1) + (-1) = -4$; $7(1) + 2(-1) \neq -5$; no
 18. $5(-2) - (-7) = -3$; $-2 + 3(-7) = -23$; yes
 19. $17(0) + 8(2) = 16$; $-(0) - 4(2) \neq 8$; no

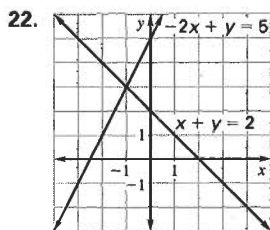
Chapter 3 continued



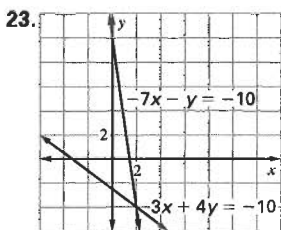
(3, 7)
 $2(3) + 7 = 13$
 $5(3) - 2(7) = 1$



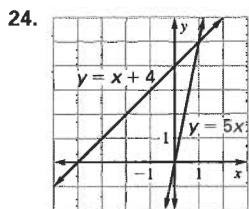
(7, 1)
 $7 + 2(1) = 9$
 $-7 + 6(1) = -1$



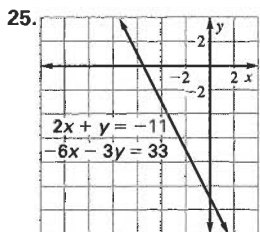
(-1, 3)
 $-2(-1) + 3 = 5$
 $-1 + 3 = 2$



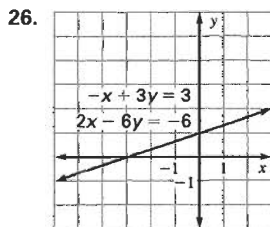
(2, -4)
 $3(2) + 4(-4) = -10$
 $-7(2) - (-4) = -10$



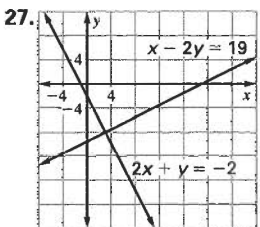
Sample answer: (-5, -1)
 $2(-5) + (-1) = -11$
 $-6(-5) - 3(-1) = 33$



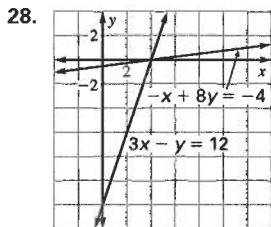
(1, 5)
 $5 = 5(1)$
 $5 = 1 + 4$



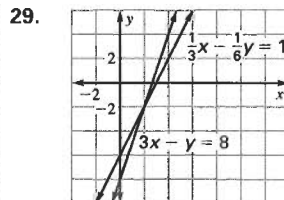
Sample answer: (6, 3)
 $-6 + 3(3) = 3$
 $2(6) - 6(3) = -6$



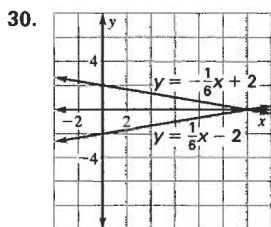
(3, -8)
 $2(3) + (-8) = -2$
 $3 - 2(-8) = 19$



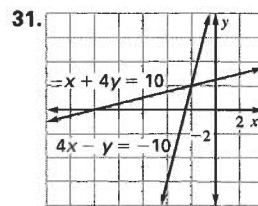
(4, 0)
 $3(4) - (0) = 12$
 $-4 + 8(0) = -4$



(2, -2)
 $3(2) - (-2) = 8$
 $\frac{2}{3} - \frac{-2}{6} = 1$



(12, 0)
 $0 = \frac{1}{6}(12) - 2$
 $0 = -\frac{1}{6}(12) + 2$



(-2, 2)
 $-(-2) + 4(2) = 10$
 $4(-2) - 2 = -10$

32. Infinitely many solutions; the two lines coincide.

33. No solution; the two lines are parallel and have no points in common. 34. One solution; the two lines intersect in a single point.

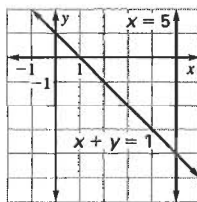
35. E; one solution 36. F; no solution

37. B; infinitely many solutions 38. D; one solution

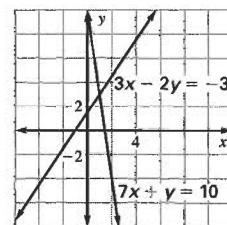
39. A; no solution 40. C; one solution

41. one solution

42. one solution



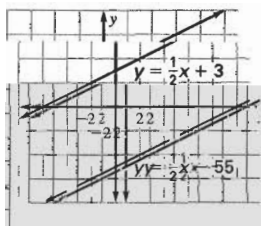
(5, -4)



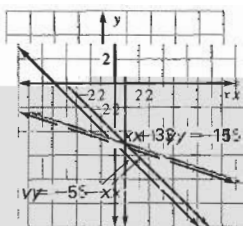
(1, 3)

Chapter 3 continued

43. no solution

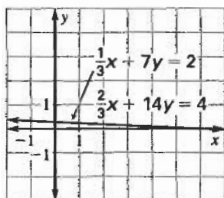


44. one solution

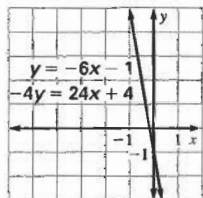


(0, -5)

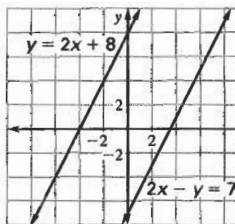
45. infinitely many solutions



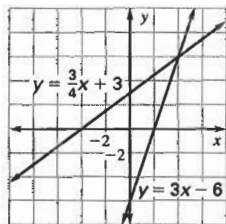
46. infinitely many solutions



47. no solution

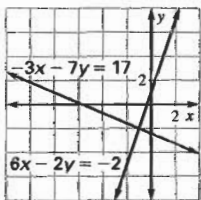


48. one solution



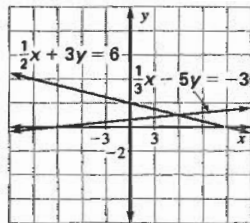
(4, 6)

49. one solution



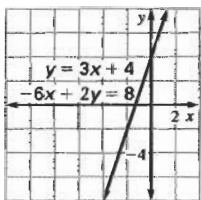
(-1, -2)

50. one solution

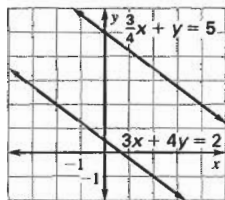


(6, 1)

51. infinitely many solutions



52. no solution

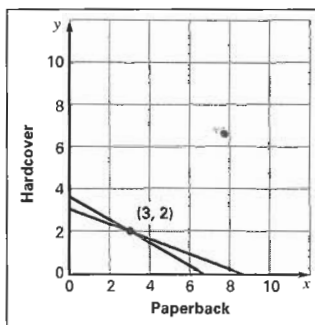


53. a. Sample answer: $2x + 3y = 5$; $4x - 7y = -3$

b. Sample answer: $2x + 3y = 5$; $-4x - 6y = 2$

c. Sample answer: $2x + 3y = 5$; $4x + 6y = 10$

54. $6.95x + 19.95y = 60.75$ You ordered 3 paperbacks
 $2x + 4y = 14$ and 2 hardcovers.



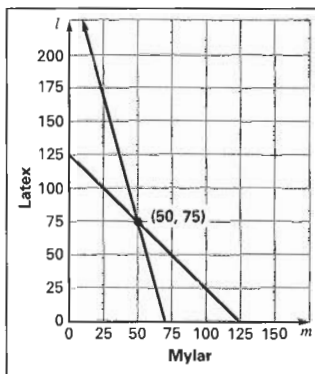
55. Number of latex balloons + Number of mylar balloons = Total number of balloons

Price per latex balloon · Number of latex balloons + Price per mylar balloon · Number of mylar balloons

= Total cost of balloons

$$l + m = 125$$

$$0.1l + 0.5m = 32.50$$



75 latex balloons and 50 mylar balloons

56. Number of minutes jogged + Number of minutes walked = Total number of minutes

Rate for jogging · Number of minutes jogged + Rate for walking · Number of minutes walked

= Total number of miles

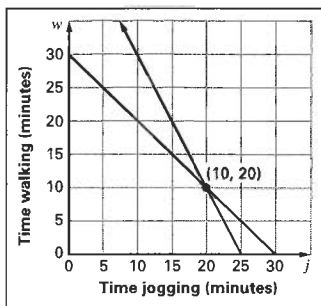
$$j + w = 30$$

$$0.1j + 0.05w = 2.5$$

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Chapter 3 continued

56. —CONTINUED—



10 minutes walking
20 minutes jogging

57.

Price of double-density disk	•	Number of double-density disks	+	Price of high-density disk	•
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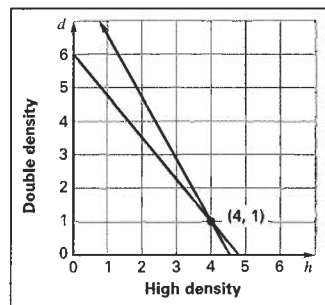
Number of high-density disks	=	Total amount to spend
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Number of K on a double-density disk	•	Number of double-density disks	+
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Number of K on a high-density disk	•	Number of high-density disks	=	Total number of K needed
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$$d + 1.25h = 6$$

$$720d + 1440h = 6480$$



You can buy 4 high-density disks and 1 double-density disk.

58. Number of regular batteries in a pack	•	Number of regular packs	+
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Number of alkaline batteries in a pack	•	Number of alkaline packs	=	Total number of batteries needed
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Cost of regular pack	•	Number of regular packs	+	Cost of alkaline pack	•
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Number of alkaline packs	=	Total amount to spend
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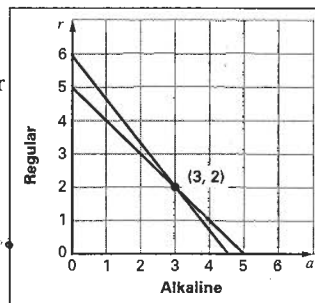
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58. —CONTINUED—

$$r + a = 5$$

$$4.25r + 5.5a = 25$$

3 packs of alkaline and 2 packs of regular batteries

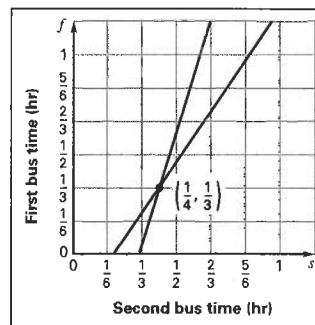


59. Let f = the travel time in hours of the first bus. Let s = the travel time in hours of the second bus.

$$f = s + \frac{1}{12}$$

10 miles from the airport

$$30f = 40s$$

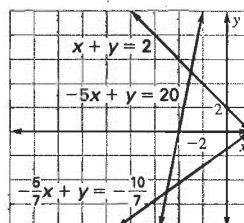


60. consistent and dependent

61. consistent and independent

62. inconsistent

63.



triangle;

$(-3, 5), (-5, -5), (2, 0)$;

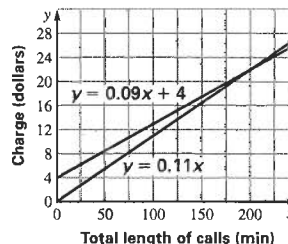
Sample answer: I graphed the lines carefully and found the apparent points of their intersections from the graph. It was easy to see that two of the lines had the same x -intercept, so that was one point. The other points I checked algebraically in the equations to make sure they were solutions.

64. a. $y = 0.09x + 4$

$$y = 0.11x$$

b. $(200, 22)$

Long-Distance Phone Service



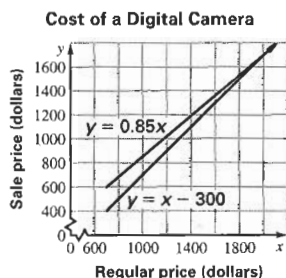
Chapter 3 continued

- c. *Sample answer:* It represents a charge of \$22 for 200 minutes of long-distance service. If you make more than 200 minutes of long-distance calls most months, then the first company with a 9¢ per minute charge is less. If you call long distance less than 200 minutes most months, then the second, with no monthly service charge, is less expensive.

65. Store 1: $y = 0.85x$

Store 2: $y = x - 300$

Store 1 has a better deal if the price of the camera is over \$2000.



3.1 Mixed Review (p. 145)

66. $4x + 11 = 39$

$4x = 28$

$x = 7$

67. $\frac{1}{2}x - 10 = 8$

$\frac{1}{2}x = 18$

$x = 36$

68. $6x - 8 = 3x + 16$

$3x = 24$

$x = 8$

69. $-9x - 2 = x + 1$

$-10x = 3$

$x = -0.3$

70. $2(3x - 5) = 7(x + 2)$

$6x - 10 = 7x + 14$

$-x = 24$

$x = -24$

71. $10(x + 1) = \frac{1}{2}(x - 18)$

$10x + 10 = \frac{1}{2}x - 9$

$\frac{19}{2}x = -19$

$x = -2$

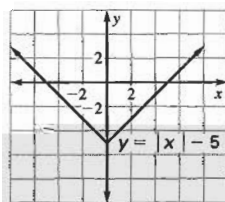
72. no; yes

73. no; no

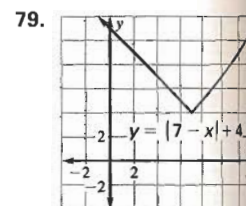
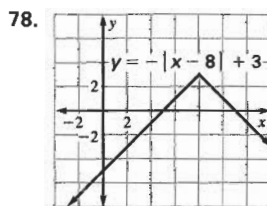
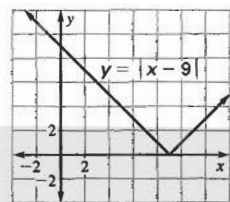
74. yes; yes

75. no; no

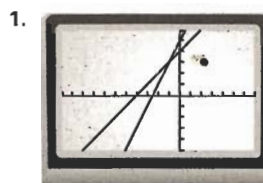
76.



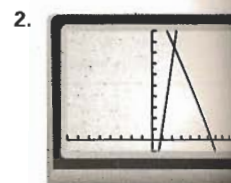
77.



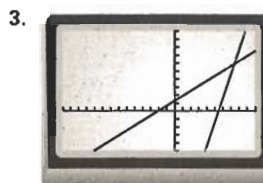
Technology Activity 3.1 (p. 146)



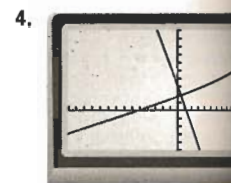
$(-1, 3)$



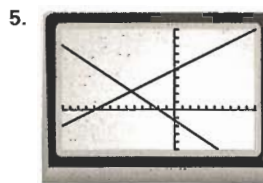
$(2.25, 8.5)$



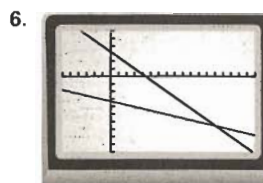
$(\frac{141}{19}, \frac{119}{19}) \approx (7.42, 6.26)$



$(\frac{8}{17}, \frac{31}{17}) \approx (0.47, 1.82)$



$(-\frac{116}{21}, \frac{47}{21}) \approx (-5.52, 2.24)$

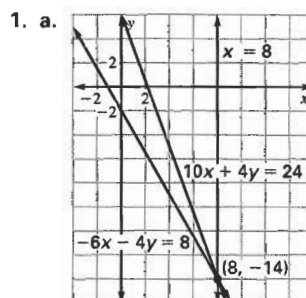


$(\frac{105}{4}, -\frac{211}{16}) \approx (26.25, -13.19)$

Lesson 3.2

Developing Concepts Activity 3.2 (p. 147)

Drawing Conclusions



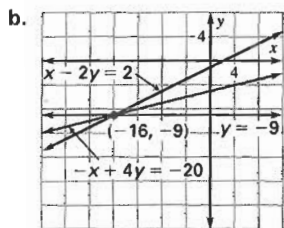
$10x + 4y = 24$

$-6x - 4y = 8$

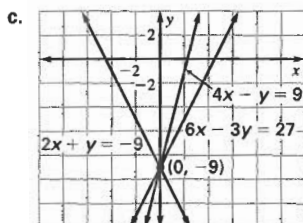
$4x = 32$

$x = 8$

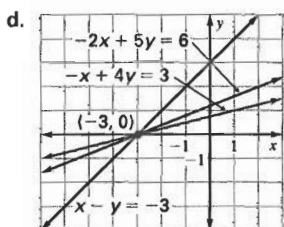
Chapter 3 continued



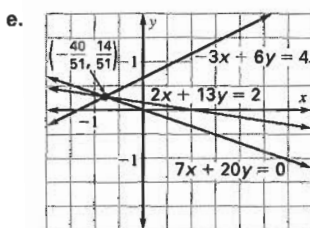
$$\begin{aligned} x - 2y &= 2 \\ -x + 4y &= -20 \\ \hline 2y &= -18 \\ y &= -9 \end{aligned}$$



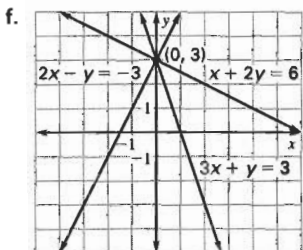
$$\begin{aligned} 6x - 3y &= 27 \\ 2x + y &= -9 \\ \hline 8x - 2y &= 18 \\ 4x - y &= 9 \end{aligned}$$



$$\begin{aligned} x - y &= -3 \\ -2x + 5y &= 6 \\ \hline -x + 4y &= 3 \end{aligned}$$



$$\begin{aligned} 7x + 20y &= 0 \\ -3x + 6y &= 4 \\ \hline 4x + 26y &= 4 \\ 2x + 13y &= 2 \end{aligned}$$



$$\begin{aligned} 2x - y &= -3 \\ x + 2y &= 6 \\ \hline 3x + y &= 3 \end{aligned}$$

2. The sum of the equations is a line whose graph contains the point of intersection.

3. *Sample answer:* The sum of the two equations is $(A + D)x + (B + E)y = C + F$. Since (p, q) is a solution of the system of equations, $Ap + Bq = C$ and $Dp + Eq = F$. At the point (p, q) , the left-hand side of the sum equation is $(A + D)p + (B + E)q = (Ap + Dp) + (Bq + Eq) = C + F$. So the point (p, q) is a solution of the sum equation as well.

3.2 Guided Practice (p. 152)

1. substitution

2. *Sample answer:* Because the revised equation is already solved for the other variable, it is the most direct way to find the value.

3. There is no solution if you come up with an equation that is never true, like $1 = -2$. There are infinitely many solutions if you come up with an equation that is always true, like $4 = 4$.

$$\begin{aligned} 4. \quad & -4(-3y - 2) - 5y = 8 & 5. \quad & 3x + 2(2x - 9) = 10 \\ & 12y + 8 - 5y = 8 & & 3x + 4x - 18 = 10 \\ & 7y = 0 & & 7x = 28 \\ & y = 0 & & x = 4 \end{aligned}$$

$$\begin{aligned} x + 3(0) &= -2 & 2(4) - y &= 9 \\ x &= -2 & y &= -1 \\ (-2, 0) & & (4, -1) & \end{aligned}$$

$$\begin{aligned} 6. \quad & 5x - 2(-7 + 3x) = 12 & 7. \quad & -3x + 2y = -6 \\ & 5x + 14 - 6x = 12 & & 5x - 2y = 18 \\ & -x = -2 & & 2x = 12 \\ & x = 2 & & x = 6 \end{aligned}$$

$$\begin{aligned} -3(2) + y &= -7 & 5(6) - 2y &= 18 \\ y &= -1 & -2y &= -12 \\ (2, -1) & & y &= 6 \\ & & (6, 6) & \end{aligned}$$

$$\begin{aligned} 8. \quad & -20x + 8y = -48 & 9. \quad & 20x - 15y = 0 \\ & -9x - 8y = 19 & & -20x + 14y = -4 \\ & -29x = -29 & & -y = -4 \\ & x = 1 & & y = 4 \end{aligned}$$

$$\begin{aligned} 5(1) - 2y &= 12 & 4x - 3(4) &= 0 \\ -2y &= 7 & 4x &= 12 \\ y &= -\frac{7}{2} & x &= 3 \end{aligned}$$

$$(1, -\frac{7}{2}) \quad (3, 4)$$

10. $2s + 2.5d = 565$

$$s + d = 250$$

$$2(250 - d) + 2.5d = 565$$

$$500 - 2d + 2.5d = 565$$

$$0.5d = 65$$

$$d = 130$$

$$s = 250 - 130$$

$$s = 120$$

120 single-scoop and 130 double-scoop cones

Chapter 3 continued

3.2 Practice and Applications (pp. 152–154)

11. $2(9 + 5y) + 3y = 5$
 $18 + 10y + 3y = 5$
 $13y = -13$
 $y = -1$
 $x = 9 + 5(-1)$
 $x = 4$
 $(4, -1)$
12. $4x - 2(6 + 2x) = 5$
 $4x - 12 - 4x = 5$
 $-12 \neq 5$
 no solution
13. $4(2y - 3) - 5y = -3$
 $8y - 12 - 5y = -3$
 $3y = 9$
 $y = 3$
 $x = 2(3) - 3$
 $x = 3$
 $(3, 3)$
14. $5x + 3(16 - 5x) = 4$
 $5x + 48 - 15x = 4$
 $-10x = -44$
 $x = \frac{22}{5}$
 $5\left(\frac{22}{5}\right) + y = 16$
 $y = -6$
 $\left(\frac{22}{5}, -6\right)$
15. $4(2y - 5) + 6y = 15$
 $8y - 20 + 6y = 15$
 $14y = 35$
 $y = \frac{5}{2}$
 $x = 2\left(\frac{5}{2}\right) - 5$
 $x = 0$
 $\left(0, \frac{5}{2}\right)$
16. $5x + 3(3x - 4) = 9$
 $5x + 9x - 12 = 9$
 $14x = 21$
 $x = \frac{3}{2}$
 $y = 3\left(\frac{3}{2}\right) - 4$
 $y = \frac{1}{2}$
 $\left(\frac{3}{2}, \frac{1}{2}\right)$
17. $7x + 4\left(9 - \frac{1}{2}x\right) = 24$
 $7x + 36 - 2x = 24$
 $5x = -12$
 $x = -\frac{12}{5}$
 $y = 9 - \frac{1}{2}\left(-\frac{12}{5}\right)$
 $y = \frac{51}{5}$
 $\left(-\frac{12}{5}, \frac{51}{5}\right)$ or $(-2.4, 10.2)$
18. $8x - 15(2 + 3x) = 7$
 $8x - 30 - 45x = 7$
 $-37x = 37$
 $x = -1$
 $y = 2 + 3(-1)$
 $y = -1$
 $(-1, -1)$

19. $5\left(8 + \frac{1}{2}y\right) + 6y = -45$
 $40 + \frac{5}{2}y + 6y = -45$
 $\frac{17}{2}y = -85$
 $y = -10$
 $8 + \frac{1}{2}(-10) = x$
 $3 = x$
 $(3, -10)$
20. $-x - 4(15 - 2x) = -3$
 $-x - 60 + 8x = -3$
 $7x = 57$
 $x = \frac{57}{7}$
 $y = 15 - 2\left(\frac{57}{7}\right)$
 $y = \frac{105}{7} - \frac{114}{7}$
 $y = -\frac{9}{7}$
 $\left(\frac{57}{7}, -\frac{9}{7}\right)$
21. $7(2 - 2y) - 3y = -20$
 $14 - 14y - 3y = -20$
 $-17y = -34$
 $y = 2$
 $x = 2 - 2(2)$
 $x = -2$
 $(-2, 2)$
22. $-9x + 3(3x - 4) = -12$
 $-9x + 9x - 12 = -12$
 $0 = 0$
 infinitely many solutions
23. $6x + 10y = -32$
 $15x - 10y = -45$
 $21x = -77$
 $x = -\frac{11}{3}$
 $3\left(-\frac{11}{3}\right) + 5y = -16$
 $5y = -5$
 $y = -1$
 $\left(-\frac{11}{3}, -1\right)$
24. $6x + 4y = 12$
 $-6x - 3y = -6$
 $y = 6$
 $6x + 4(6) = 12$
 $6x = -12$
 $x = -2$
 $(-2, 6)$
25. $-12x + 10y = 8$
 $7x - 10y = -8$
 $-5x = 0$
 $x = 0$
 $-6(0) + 5y = 4$
 $y = \frac{4}{5}$
 $\left(0, \frac{4}{5}\right)$
26. $35x - 20y = -15$
 $8x + 20y = -28$
 $43x = -43$
 $x = -1$
 $35(-1) - 20y = -15$
 $-20y = 20$
 $y = -1$
 $(-1, -1)$
27. $-72x + 48y = 0$
 $72x - 48y = 0$
 $0 = 0$
 infinitely many solutions

Chapter 3 continued

28. $-10x - 12y = 32$

$$\frac{10x + 50y = 25}{38y = 57}$$

$$38y = 57$$

$$y = \frac{3}{2}$$

$$2x = 5 - 10\left(\frac{3}{2}\right)$$

$$2x = -10$$

$$x = -5$$

$$\left(-5, \frac{3}{2}\right)$$

30. $-45x - 6y = -93$

$$4x + 6y = 11$$

$$-41x = -82$$

$$x = 2$$

$$4(2) + 6y = 11$$

$$6y = 3$$

$$y = \frac{1}{2}$$

$$\left(2, \frac{1}{2}\right)$$

32. $14x + 4y = -6$

$$\frac{-14x - 4y = 6}{0 = 0}$$

$$0 = 0$$

infinitely many solutions

34. $-15x + 6y = -30$

$$\frac{3x - 6y = -18}{-12x = -48}$$

$$-12x = -48$$

$$x = 4$$

$$3(4) - 6y = -18$$

$$-6y = -30$$

$$y = 5$$

$$(4, 5)$$

29. $105x - 40y = -5$

$$\frac{72x + 40y = 64}{177x = 59}$$

$$177x = 59$$

$$x = \frac{1}{3}$$

$$9\left(\frac{1}{3}\right) + 5y = 8$$

$$5y = 5$$

$$y = 1$$

$$\left(\frac{1}{3}, 1\right)$$

31. $4x + 80y = 592$

$$\frac{-4x + 2y = 13}{82y = 605}$$

$$82y = 605$$

$$y = \frac{605}{82}$$

$$-4x + 2\left(\frac{605}{82}\right) = 13$$

$$-4x = \frac{533}{41} - \frac{605}{41}$$

$$-4x = \frac{-72}{41}$$

$$x = \frac{18}{41}$$

$$\left(\frac{18}{41}, \frac{605}{82}\right) \text{ or } (0.439, 7.378)$$

33. $18x - 3y = -6$

$$\frac{-18y + 3y = 4}{0 \neq -2}$$

$$0 \neq -2$$

no solution

35. $5x - 7y = -11$

$$\frac{-5x + 3y = 19}{-4y = 8}$$

$$-4y = 8$$

$$y = -2$$

$$-5x + 7(-2) = 11$$

$$-5x = 25$$

$$x = -5$$

$$(-5, -2)$$

36. $-2(3 + y) + 2y = -6$

$$\frac{-6 - 2y + 2y = -6}{0 = 0}$$

$$0 = 0$$

infinitely many solutions

37. $6x - 15y = 30$

$$\frac{-6x + 8y = -30}{-7y = 0}$$

$$-7y = 0$$

$$y = 0$$

$$2x - 5(0) = 10$$

$$2x = 10$$

$$x = 5$$

$$(5, 0)$$

38. $-6x + 2y = 22$

$$\frac{5x - 2y = -16}{-x = 6}$$

$$-x = 6$$

$$x = -6$$

$$5(-6) - 2y = -16$$

$$-2y = 14$$

$$y = -7$$

$$(-6, -7)$$

40. $-3(4y - 2) + 8y = -1$

$$\frac{-12y + 6 + 8y = -1}{-4y = -7}$$

$$-4y = -7$$

$$y = \frac{7}{4}$$

$$x = 4\left(\frac{7}{4}\right) - 2$$

$$x = 5$$

$$\left(5, \frac{7}{4}\right)$$

41. $10x + 25y = 85$

$$\frac{-10x - 14y = -20}{11y = 65}$$

$$11y = 65$$

$$y = \frac{65}{11}$$

$$-5x - 7\left(\frac{65}{11}\right) = -10$$

$$-5x = -10 + \frac{455}{11}$$

$$-5x = \frac{345}{11}$$

$$x = -\frac{69}{11}$$

$$\left(-\frac{69}{11}, \frac{65}{11}\right)$$

Chapter 3 continued

$$42. -3x + 7(5x - 10) = 6$$

$$-3x + 35x - 70 = 6$$

$$32x = 76$$

$$x = \frac{19}{8}$$

$$y = 5\left(\frac{19}{8}\right) - 10$$

$$y = \frac{95}{8} - \frac{80}{8}$$

$$y = \frac{15}{8}$$

$$\left(\frac{19}{8}, \frac{15}{8}\right)$$

$$43. -4x + 6y = 40$$

$$4x + 4y = -15$$

$$10y = 25$$

$$y = \frac{5}{2}$$

$$4x + 4\left(\frac{5}{2}\right) = -15$$

$$4x = -25$$

$$x = -\frac{25}{4}$$

$$\left(-\frac{25}{4}, \frac{5}{2}\right)$$

$$45. \frac{1}{2}(17 + y) - 3y = 1$$

$$\frac{17}{2} + \frac{1}{2}y - \frac{6}{2}y = 1$$

$$-\frac{5}{2}y = -\frac{15}{2}$$

$$y = 3$$

$$x = 17 + 3$$

$$x = 20$$

$$(20, 3)$$

$$47. 36x + 9y = 48$$

$$-36x - 9y = 32$$

$$0 \neq 0$$

no solution

$$44. 33x - 77y = 220$$

$$-33x + 30y = 15$$

$$-47y = 235$$

$$y = -5$$

$$3x - 7(-5) = 20$$

$$3x = -15$$

$$x = -5$$

$$(-5, -5)$$

$$46. 8x + 18y = -20$$

$$-8x - 12y = 8$$

$$6y = -12$$

$$y = -2$$

$$4x + 9(-2) = -10$$

$$4x = 8$$

$$x = 2$$

$$(2, -2)$$

$$48. -2x + 10y = 34$$

$$2x - 10y = -34$$

$$0 = 0$$

infinitely many solutions

$$49. -2x + 2\left(9 - \frac{1}{3}x\right) = -6$$

$$-2x + 18 - \frac{2}{3}x = -6$$

$$-\frac{8}{3}x = -24$$

$$x = 9$$

$$y = 9 - \frac{1}{3}(9)$$

$$y = 6$$

$$(9, 6)$$

50. a. *Sample answer:* The second equation is equal to -2 times the first, so there are infinitely many solutions.

b. *Sample answer:* The left-hand side of the second equation is equal to 3 times the left-hand side of the first equation, but $12 \neq 3 \cdot 8$, so there are no solutions.

$$51. y = \frac{3}{2}x \quad \text{eq. 1}$$

$$y - 5 = \frac{5 + 3}{1 - 5}(x - 1)$$

$$y - 5 = -2(x - 1)$$

$$y = 2x + 7 \quad \text{eq. 2}$$

$$-2x + 7 = \frac{3}{2}x$$

$$7 = \frac{7}{2}x$$

$$2 = x$$

$$y = \frac{3}{2}(2)$$

$$y = 3$$

$$(2, 3)$$

$$52. y - 6 = \frac{6 - 1}{6 - 1}(x - 6)$$

$$y - 6 = x - 6$$

$$y = x \quad \text{eq. 1}$$

$$y - 4 = \frac{4 - 2}{0 - 6}(x)$$

$$y = -\frac{1}{3}x + 4 \quad \text{eq. 2}$$

$$x = -\frac{1}{3}x + 4$$

$$\frac{4}{3}x = 4$$

$$x = 3$$

$$y = 3$$

$$(3, 3)$$

Chapter 3 continued

$$53. y - 5 = \frac{5+1}{1-3}(x-1)$$

$$y - 5 = -3(x-1)$$

$$y = -3x + 8 \quad \text{eq. 1}$$

$$y - 3 = \frac{3-0}{4+2}(x-4)$$

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

$$y = \frac{1}{2}x + 1 \quad \text{eq. 2}$$

$$-3x + 8 = \frac{1}{2}x + 1$$

$$-\frac{7}{2}x = -7$$

$$x = 2$$

$$y = -3(2) + 8 = 2$$

(2, 2)

$$54. 36 + 3.5b = 5b$$

$$36 = 1.5b$$

$$24 = b$$

$$5(24) = \$120$$

24 boxes; \$120

$$55. 15.5 = 2y + 6x$$

$$-10.25 = -2y - 3x$$

$$5.25 = 3x$$

$$1.75 = x$$

$$15.5 = 2y + 6(1.75)$$

$$5 = 2y$$

$$2.5 = y$$

$$56. 2C + 6H = 30.07$$

$$3C + 8H = 44.097$$

$$-6C - 18H = -90.21$$

$$6C + 16H = 88.194$$

$$-2H = -2.016$$

$$H = 1.008 \text{ u}$$

$$2C + 6(1.008) = 30.07$$

$$2C = 30.07 - 6.048$$

$$2C = 24.022$$

$$C = 12.011 \text{ u}$$

Sample answer: Let x = the cost per foot of cable and y = cost per connector. Then $6x + 2y = 15.50$ and $3x + 2y = 10.25$. Subtracting the second equation from the first, find $x = 1.75$. Then a 4-ft cable with connectors will cost $7 + 5 = \$12$.

$$57. 380 = 8s + 12w$$

$$40 = s + w$$

$$380 = 8(40 - w) + 12w$$

$$380 = 320 - 8w + 12w$$

$$60 = 4w$$

$$15 = w$$

$$s = 40 - 15 = 25$$

swim: 15 minutes

skate: 25 minutes

$$58. 3.25x + 3.25y = 975$$

$$x = y + 60$$

$$3.25(y + 60) + 3.25y = 975$$

$$6.5y = 780$$

$$y = 120$$

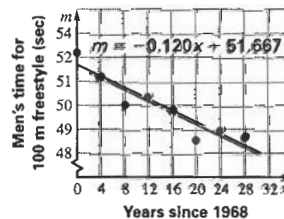
$$x = 120 + 60$$

$$x = 180$$

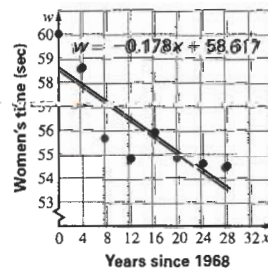
(180, 120)

The smaller bedroom is 120 ft²; the larger one is 180 ft².

59. Olympic Times for Men's 100 m Freestyle



Olympic Times for Women's 100 m Freestyle

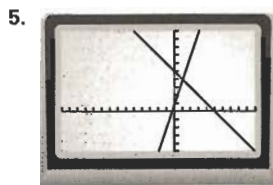


$$60. m = -0.12x + 51.667$$

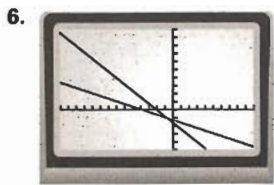
$$w = -0.178x + 58.617$$

61. (119.83, 37.288); about 120 years after the 1968 olympics, in the year 2088 summer olympics, the men's and women's times in the 100 meter freestyle will both be about 37.3 seconds.

Chapter 3 continued



(1, 4)



(-1, -1)

7. infinitely many solutions 8. 1 9. no solution 10. 1
11. 1 12. infinitely many solutions

13. $-2(-5 - y) + 2y = -5$ 14. $-3x + 2y = -6$
 $10 + 2y + 2y = -5$ $5x - 2y = 18$
 $4y = -15$ $2x = 12$
 $y = -\frac{15}{4}$ $x = 6$
 $-3(6) + 2y = -6$
 $2y = 12$
 $y = 6$
 $x = -5 + \frac{15}{4}$
 $x = -\frac{5}{4}$ (6, 6)

$(-\frac{5}{4}, -\frac{15}{4})$

15. $-12x - 3y = -3$ 16. $-3(3 - 2y) - 4y = -2$
 $12x + 3y = 3$ $-9 + 6y - 4y = -2$
 $0 = 0$ $2y = 7$
 infinitely many solutions $y = \frac{7}{2}$

$x = 3 - 2(\frac{7}{2})$

$x = -4$

$(-4, \frac{7}{2})$

17. $6x - 16y = 22$
 $-6x + 16y = -5$
 $0 \neq 17$

no solution

18. $15x - 40y = -35$ 19. $3s + 5n = 3943$
 $-15x - 18y = 9$ $s + n = 937$
 $-58y = -26$ $3(937 - n) + 5n = 3943$
 $y = \frac{13}{29}$ $2811 - 3n + 5n = 3943$
 $3x - 8(\frac{13}{29}) = -7$ $2n = 1132$
 $3x = -\frac{99}{29}$ $n = 566$
 $x = -\frac{33}{29}$ $s = 937 - 566$
 $x = -\frac{33}{29}$ $s = 371$
 371 tickets sold to students
 566 tickets sold to non-students

$(-\frac{33}{29}, \frac{13}{29})$

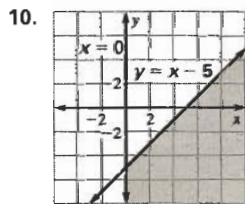
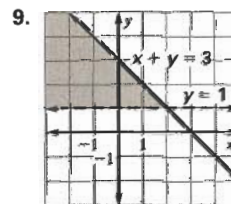
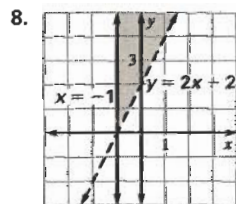
Lesson 3.3

Activity (p. 156)

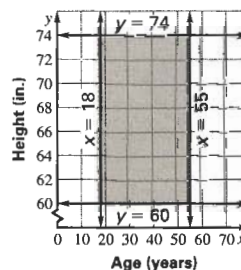
- Region 1
- Region 3
- Region 4
- Region 2

3.3 Guided Practice (p. 159)

- It must satisfy every inequality in the system.
- It is not a solution because it does not satisfy inequality 1; $-5 \not\geq 2$.
- The line $y = 3$ should be solid, and the region above the line $x + y = 5$ should be shaded, not the region below.
- $-1 \geq -1$; $2 > -2 + 2$; yes 5. $0 \geq -1$; $0 \not\geq 0 + 2$; no
6. $1 \geq -1$; $4 \not\geq 2 + 2$; no 7. $2 \geq -1$; $7 > 2(2) + 2$; yes

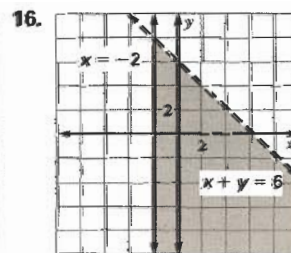
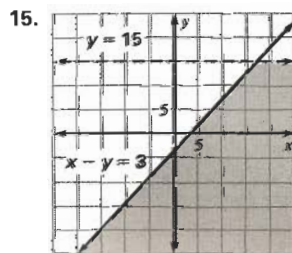


11. $18 \leq x \leq 55$
 $60 \leq y \leq 74$



3.3 Practice and Applications (pp. 159-162)

12. yes 13. no 14. yes



Sample answer: (13, 10)

Sample answer: (0, 0)