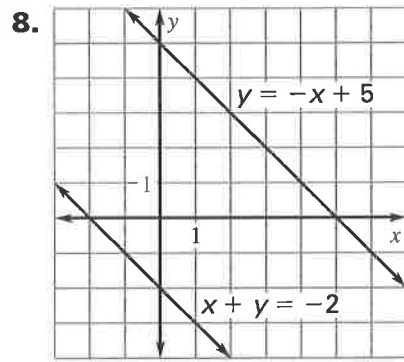


Answers for 7.5

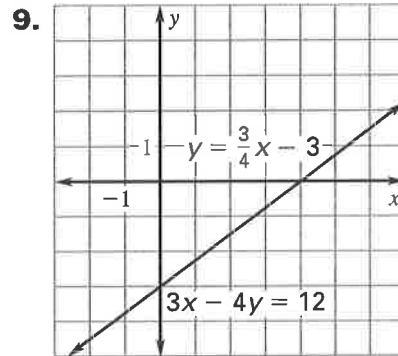
For use with pages 462–465

7.5 Skill Practice

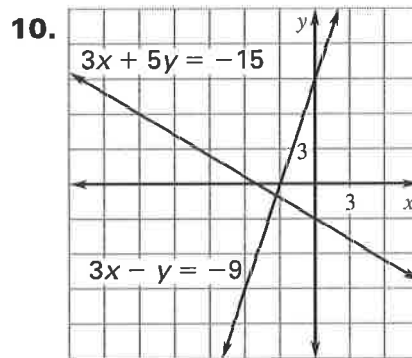
1. inconsistent system
2. consistent dependent system
3. *Sample answer:* The lines have the same slope but different intercepts.
4. *Sample answer:* The graph would show only one line.
5. B; one solution
6. C; no solution
7. A; infinitely many solutions



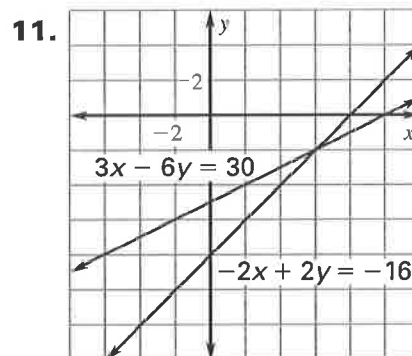
no solution



infinitely many solutions

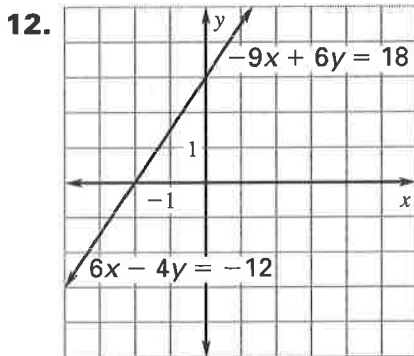


one solution

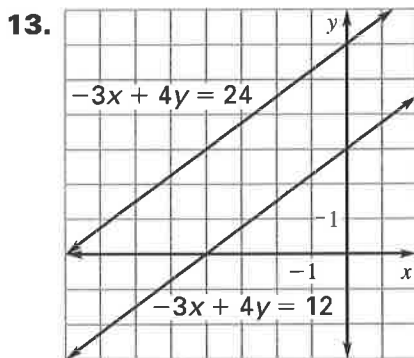


one solution

Answers for 7.5 *continued*
For use with pages 462–465

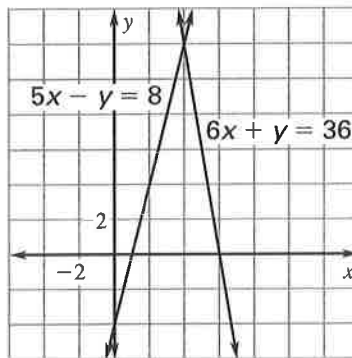


infinitely many solutions



no solution

14. Sample answer: The lines do not have the same slope, so they are not parallel and they do have a solution. If the graph were larger the lines would intersect at (4, 12);



15. (-3, 4)

16. infinitely many solutions

17. (3, 7)

18. infinitely many solutions

19. (2, 2) **20.** no solution

21. no solution **22.** (3, 0)

23. (0, 3) **24.** C

25. D **26.** no solution

27. infinitely many solutions

28. one solution

29. infinitely many solutions

30. one solution

31. infinitely many solutions

32. Sample answer:
 $y = 3x + 2, 2y = 6x + 4$

33. Sample answer:
 $7x - 8y = -9, 7x - 8y = 4$

34. Sample answer: $y = 3x, 2y = 6x$

Answers for 7.5 *continued*
For use with pages 462–465

- 35. a.** *Sample answer:*
 $p = 2, q = -3, r = 0$
- b.** *Sample answer:*
 $p = 4, q = -6, r = 10$
- c.** *Sample answer:*
 $p = 1, q = 1, r = 5$

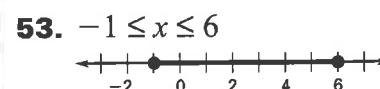
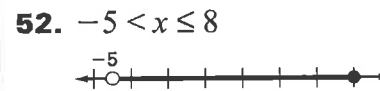
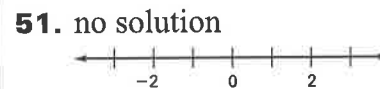
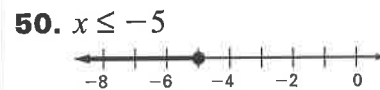
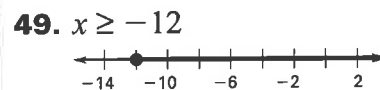
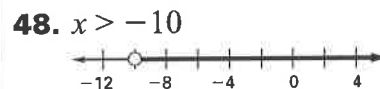
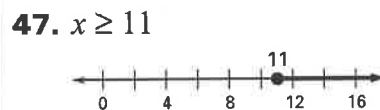
7.5 Problem Solving

- 36.** No. *Sample answer:* There are infinitely many solutions to the resulting linear system.
- 37.** Yes. *Sample answer:* There is one solution to the resulting linear system.
- 38. a.** No. *Sample answer:* There are infinitely many solutions to the resulting linear system.
- b.** Yes. *Sample answer:* You can write a new equation and create a linear system that has only one solution.
- 39. a.** $d = \frac{t}{3}, d = \frac{t}{3} - 5$
- b.** *Sample answer:* No, since the lines are parallel, the two climbers will never be at the same distance at the same time.

- 40. a.** $y = 5x, y = 4(x - 10)$
- b.** $(-40, -200)$
- c.** No. *Sample answer:* x and y only make sense for positive values.
- 41.** 540 miles

7.5 Mixed Review

- 42.** -6 **43.** 4
- 44.** -3 **45.** 8

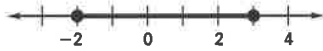


Answers for 7.5 *continued*
 For use with pages 462–465

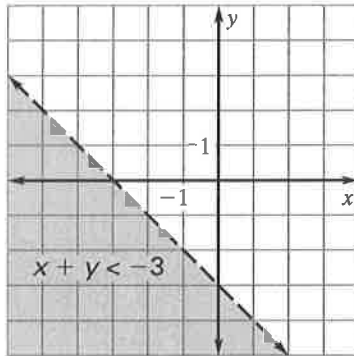
54. $x \leq -2$ or $x \geq 8$



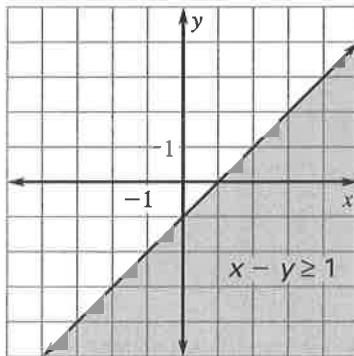
55. $-2 \leq x \leq 3$



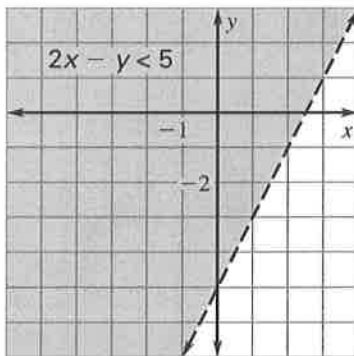
56.



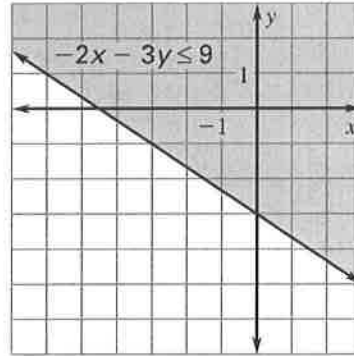
57.



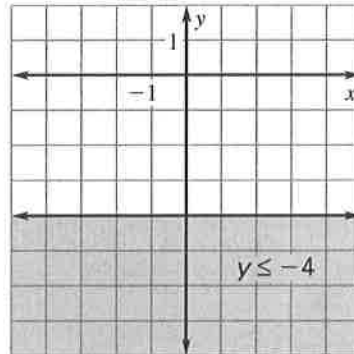
58.



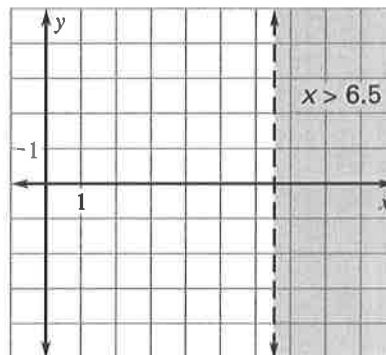
59.



60.



61.



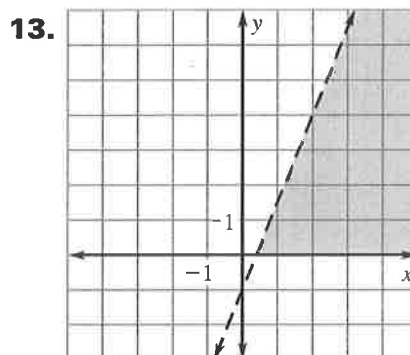
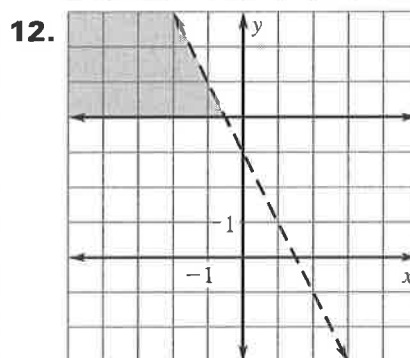
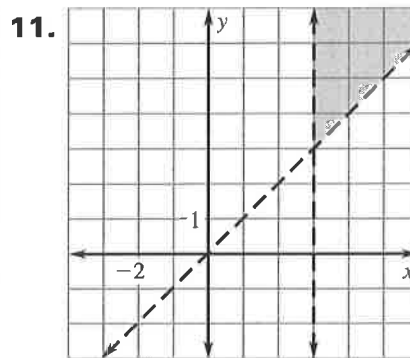
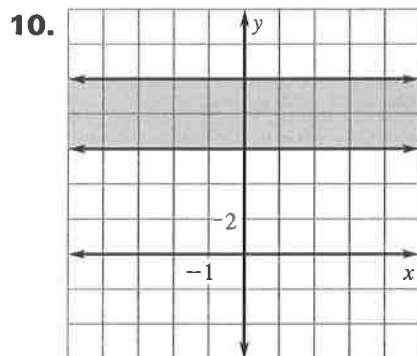
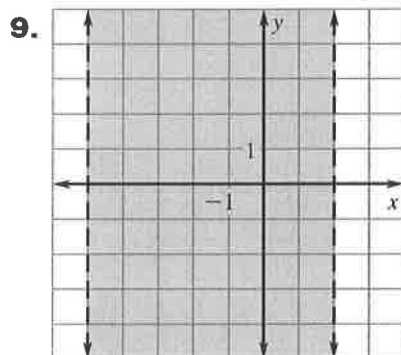
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Answers for 7.6

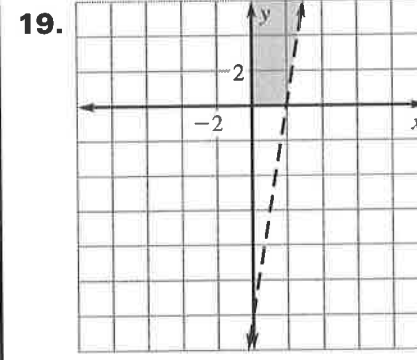
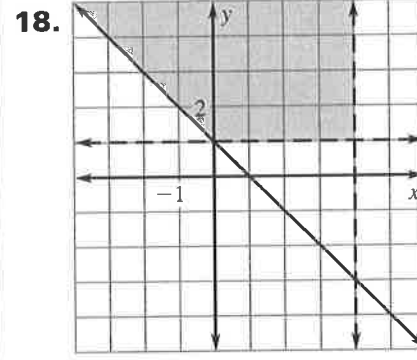
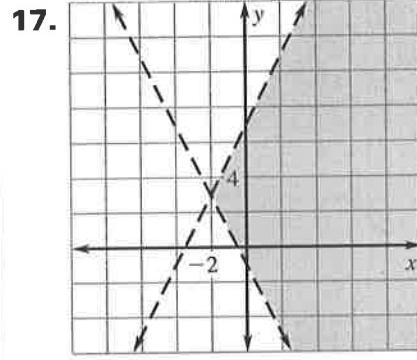
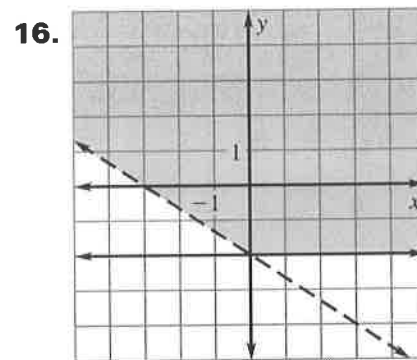
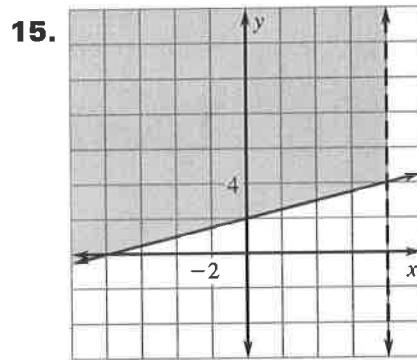
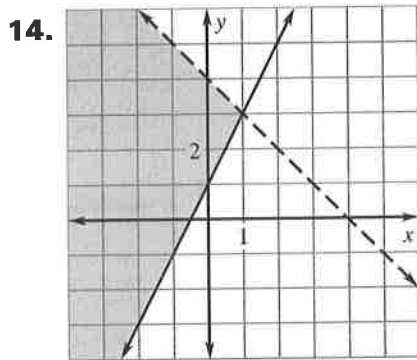
For use with pages 469–473

7.6 Skill Practice

1. solution
2. *Sample answer:* Graph each inequality then shade the region that is the intersection of the solutions to each inequality. Then check the solution with a test point.
3. not a solution
4. solution
5. not a solution
6. C 7. A 8. B

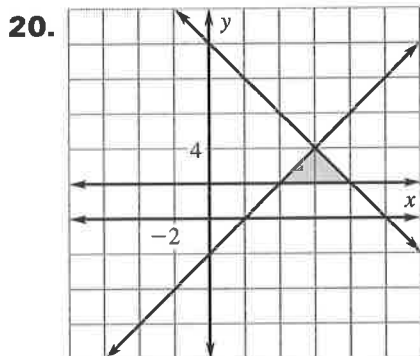


Answers for 7.6 *continued*
 For use with pages 469–473



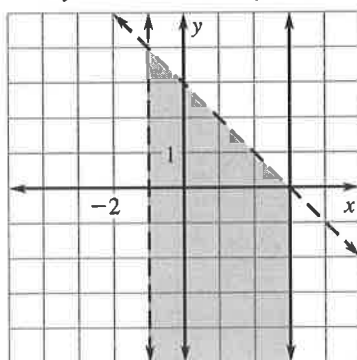
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Answers for 7.6 *continued*
For use with pages 469–473

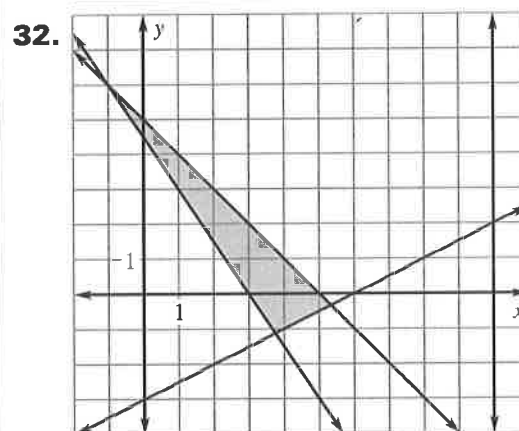
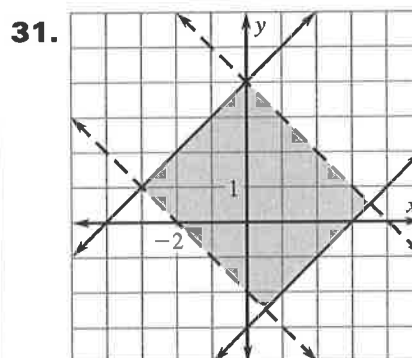
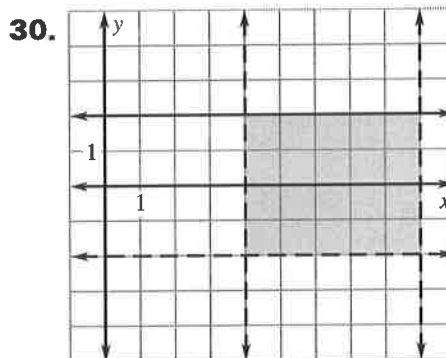


21. D **22. B**

23. The graph is shaded to include $x + y > 3$, not $x + y < 3$.



- 24.** $x > 1, x < 4$
25. $y > -1, y < 4$
26. $y \geq -3, y < 2$
27. $y \leq 5x + 1, y > x - 2$
28. $y \geq 2x + 2, y \leq 2x + 5, x \leq 0, y \geq 0$
29. $y \leq x - 3, y > -2x - 1, y > -6$



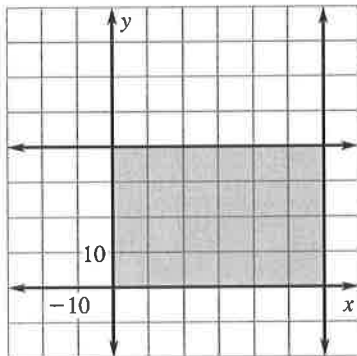
- 33.** No; there are no possible values for x and y that satisfy both equations.
34. $x \geq 2, x \leq 6, y \geq 1, y \leq 4$

Answers for 7.6 *continued*
 For use with pages 469–473

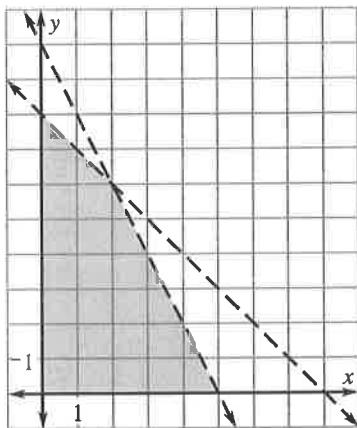
35. $y \leq \frac{1}{3}x + 1, y \geq -\frac{2}{3}x - 2,$
 $y \geq \frac{4}{3}x - 2$

7.6 Problem Solving

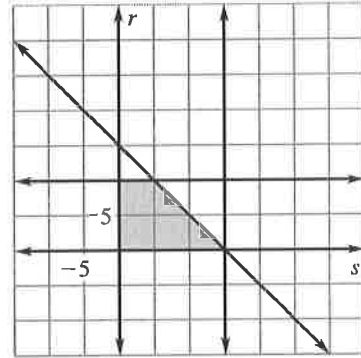
36. Let x represent the musical evaluation score and y represent the visual evaluation score.
 $x \leq 60, y \leq 40, x \geq 0, y \geq 0$



37. $14x + 7y < 70, x + y < 8,$
 $x \geq 0, y \geq 0$



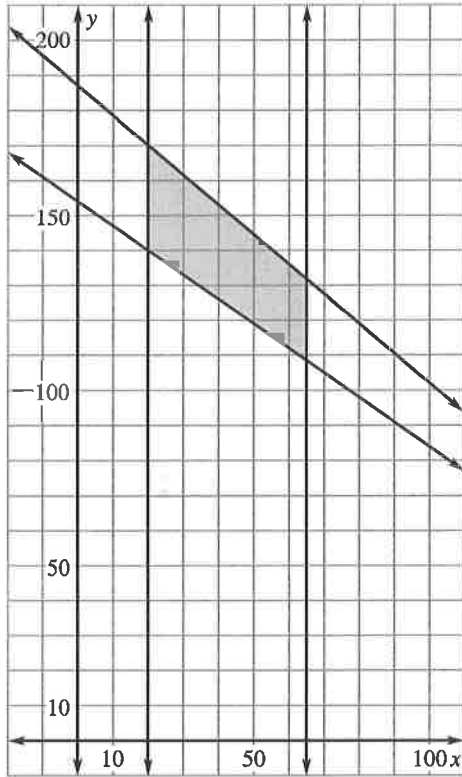
38. a. Let s represent the number of surfperch and r represent the number of rockfish. $s \leq 15,$
 $s + r \leq 15, r \leq 10, s \geq 0, r \geq 0$



b. no

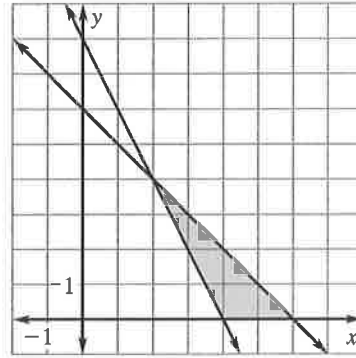
Answers for 7.6 *continued*
 For use with pages 469–473

39. a. $20 \leq x \leq 65, y \geq 154 - 0.7x,$
 $y \leq 187 - 0.85x$



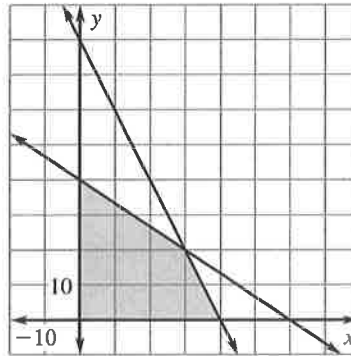
b. No. *Sample answer:*
 The heart rate is below 70%
 of the maximum heart rate.

40. a. $8x + 8y \leq 48, 4x + 2y \geq 16,$
 $x \geq 0, y \geq 0$



b. Yes. *Sample answer:*
 It would cost \$48 and give
 you 18 pictures.

41. a. $0.5x + 0.25y \leq 20,$
 $2y + 3x \leq 120, y \geq 0, x \geq 0$



b. $(0, 0), (40, 0), (0, 40), (30, 20)$

c. $(0, 0)$: \$0, $(40, 0)$: \$400,
 $(0, 40)$: \$320, $(30, 20)$: \$460.
 The maximum revenue is at
 $(30, 20)$, or 30 necklaces and
 20 bracelets.

Answers for 7.6 *continued*
For use with pages 469–473

7.6 Mixed Review

42. 52 43. 8 44. -17

45. -42 46. $-\frac{3}{5}$ 47. 33

48. (2, 7) 49. (-2, -2)

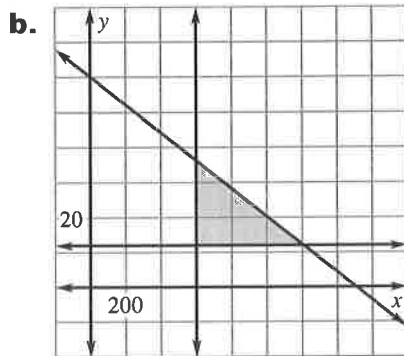
50. (5, -3) 51. (-1, 4)

52. $(-3\frac{1}{3}, -1\frac{2}{3})$

53. $(2\frac{2}{3}, -3)$

7.5–7.6 Mixed Review of Problem Solving

1. a. $x \geq 600, y \geq 12,$
 $2x + 50y \leq 3000$



c. yes

2. a. $2x + 4y = 120, x + 2y = 60$

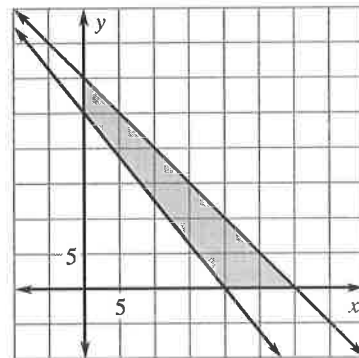
b. No. *Sample answer:* There are infinitely many solutions to the linear system.

c. ceiling paint: \$22,
wall paint: \$19

3. No; when you solve the linear system, you get $0 = 0$. So, there is not enough information to determine the cost of 1 CD.

4. No. *Sample answer:* The lines are parallel so there is never a point when the shuttles will have traveled the same distance at the same time.

5. a. Let x represent the hours working as a lifeguard, and y represent the hours working at a retail store.
 $10x + 8y \geq 200, x + y \leq 30,$
 $x \geq 0, y \geq 0$

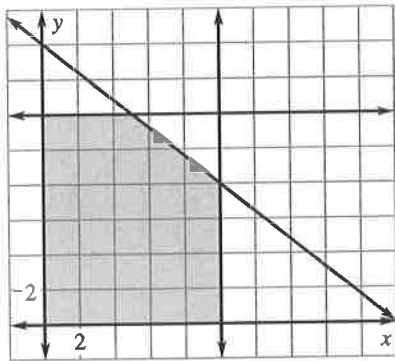


b. No; you will earn \$170.

c. $4 \leq x \leq 10$

Answers for 7.6 *continued*
 For use with pages 469–473

6. *Sample answer:* You have 80 dollars and want to buy cups at a store. Small cups are \$4, and large cups are \$5. The store has 10 small cups and 12 large cups.
 $x \geq 0, y \geq 0, x \leq 10, y \leq 12,$
 $4x + 5y \leq 80$



7. 90 ft²;

		9	0
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<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	0	0	0
1	1	1	1
2	2	2	2
3	3	3	3
4	4	4	4
5	5	5	5
6	6	6	6
7	7	7	7
8	8	8	8
9	9	<input checked="" type="checkbox"/>	9

7

CHAPTER REVIEW

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- Multi-Language Glossary
- Vocabulary practice

REVIEW KEY VOCABULARY

- system of linear equations, p. 427
- solution of a system of linear equations, p. 427
- consistent independent system, p. 427
- inconsistent system, p. 459
- consistent dependent system, p. 459
- system of linear inequalities, p. 466
- solution of a system of linear inequalities, p. 466
- graph of a system of linear inequalities, p. 466

VOCABULARY EXERCISES

1. Copy and complete: A(n) ? consists of two or more linear inequalities in the same variables. **system of linear inequalities**
2. Copy and complete: A(n) ? consists of two or more linear equations in the same variables. **system of linear equations**
3. Describe how you would graph a system of two linear inequalities. **See margin.**
4. Give an example of a consistent dependent system. Explain why the system is a consistent dependent system. **Sample answer: $y = 2x + 3$, $2y = 4x + 6$; the lines intersect (are consistent) and the equations are equivalent (are dependent).**

REVIEW EXAMPLES AND EXERCISES

Use the review examples and exercises below to check your understanding of the concepts you have learned in each lesson of Chapter 7.

7.1 Solve Linear Systems by Graphing

pp. 427–433

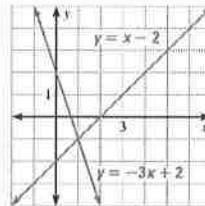
EXAMPLE

Solve the linear system by graphing. Check your solution.

$$\begin{array}{ll} y = x - 2 & \text{Equation 1} \\ y = -3x + 2 & \text{Equation 2} \end{array}$$

Graph both equations. The lines appear to intersect at $(1, -1)$. Check the solution by substituting 1 for x and -1 for y in each equation.

$$\begin{array}{l|l} y = x - 2 & y = -3x + 2 \\ -1 \stackrel{?}{=} 1 - 2 & -1 \stackrel{?}{=} -3(1) + 2 \\ -1 = -1 \checkmark & -1 = -1 \checkmark \end{array}$$



EXERCISES

Solve the linear system by graphing. Check your solution.

5. $y = -3x + 1$ $(2, -5)$
6. $y = 3x + 4$ $(-1, 1)$
 $y = -2x - 1$
7. $x + y = 3$ $(4, -1)$
 $x - y = 5$

EXAMPLES
1 and 2
on pp. 427–428
for Exs. 5–7

Extra Example 7.1

Solve the linear system by graphing. Check your solution.

$$\begin{array}{l} y = -x + 4 \\ y = 2x - 5 \quad (3, 1) \end{array}$$

3. **Sample answer:** Graph each inequality then shade the region that is the intersection of the solutions to each inequality. Then check the solution with a test point.

CHAPTER REVIEW

Extra Example 7.2

Solve the linear system using substitution.

$$y + 2x = 13$$

$$-x + 4y = -2 \quad (6, 1)$$

Extra Example 7.3

Solve the linear system using elimination.

$$-2x + 3y = 6$$

$$-2x + 5y = -6 \quad (-12, -6)$$

EXAMPLES
: 1, 2, and 3
: on pp. 435–437
: for Exs. 8–11

7.2 Solve Linear Systems by Substitution

pp. 435–441

EXAMPLE

Solve the linear system: $3x + y = -9$ Equation 1
 $y = 5x + 7$ Equation 2

STEP 1 Substitute $5x + 7$ for y in Equation 1 and solve for x .

$$3x + y = -9 \quad \text{Write Equation 1.}$$

$$3x + 5x + 7 = -9 \quad \text{Substitute } 5x + 7 \text{ for } y.$$

$$x = -2 \quad \text{Solve for } x.$$

STEP 2 Substitute -2 for x in Equation 2 to find the value of y .

$$y = 5x + 7 = 5(-2) + 7 = -10 + 7 = -3$$

► The solution is $(-2, -3)$. Check the solution by substituting -2 for x and -3 for y in each of the original equations.

EXERCISES

Solve the linear system using substitution.

8. $y = 2x - 7$ (3, -1)
 $x + 2y = 1$

9. $x + 4y = 9$ (5, 1)
 $x - y = 4$

10. $2x + y = -15$ (-3, -9)
 $y - 5x = 6$

11. **ART** Kara spends \$16 on tubes of paint and disposable brushes for an art project. Each tube of paint costs \$3, and each disposable brush costs \$.50. Kara purchases twice as many brushes as tubes of paint. Find the number of brushes and the number of tubes of paint that she purchases.
4 tubes of paint, 8 brushes

7.3 Solve Linear Systems by Adding or Subtracting

pp. 444–450

EXAMPLE

Solve the linear system: $5x - y = 8$ Equation 1
 $-5x + 4y = -17$ Equation 2

STEP 1 Add the equations to eliminate one variable.

$$\begin{array}{r} 5x - y = 8 \\ -5x + 4y = -17 \\ \hline 3y = -9 \end{array}$$

STEP 2 Solve for y .

$$y = -3$$

STEP 3 Substitute -3 for y in either equation and solve for x .

$$5x - y = 8 \quad \text{Write Equation 1.}$$

$$5x - (-3) = 8 \quad \text{Substitute } -3 \text{ for } y.$$

$$x = 1 \quad \text{Solve for } x.$$

► The solution is $(1, -3)$. Check the solution by substituting 1 for x and -3 for y in each of the original equations.

Extra Example 7.5

Show that the linear system has infinitely many solutions.

$$y = -2x - 4$$

$$6x + 3y = -12$$

Substitute $-2x - 4$ for y in the equation $6x + 3y = -12$ and solve for x .

$$6x + 3y = -12$$

$$6x + 3(-2x - 4) = -12$$

$$6x - 6x - 12 = -12$$

$$-12 = -12$$

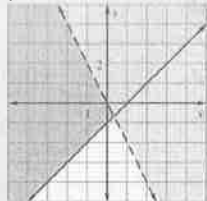
Since this is a true statement, the system has infinitely many solutions.

Extra Example 7.6

Graph the system of linear inequalities.

$$y \geq x - 1$$

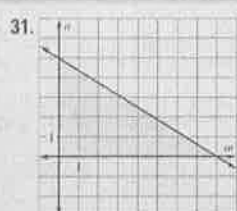
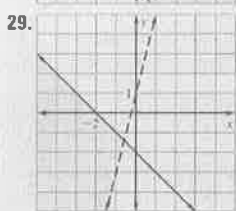
$$y < -2x$$



25. No solution. *Sample answer:* When the variables are eliminated, a false statement remains, which means there is no solution.

26. Infinitely many solutions. *Sample answer:* When the variables are eliminated, a true statement remains, which means there are infinitely many solutions.

27. One solution. *Sample answer:* The lines have different slopes, so there is only one solution.

**7.5 Solve Special Types of Linear Systems**

pp. 459–465

EXAMPLE

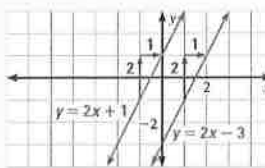
Show that the linear system has no solution.

$$-2x + y = -3 \quad \text{Equation 1}$$

$$y = 2x + 1 \quad \text{Equation 2}$$

Graph the linear system.

The lines are parallel because they have the same slope but different y -intercepts. Parallel lines do not intersect, so the system has no solution.

**EXERCISES**

Tell whether the linear system has *one solution*, *no solution*, or *infinitely many solutions*. Explain. 25–27. See margin.

25. $x = 2y - 3$

$$1.5x - 3y = 0$$

26. $-x + y = 8$

$$x + 8 = y$$

27. $4x = 2y + 6$

$$4x + 2y = 10$$

EXAMPLES
: 1, 2, and 3
: on pp. 459–461
: for Exs. 25–27

7.6 Solve Systems of Linear Inequalities

pp. 466–472

EXAMPLE

Graph the system of linear inequalities.

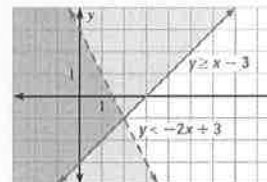
$$y < -2x + 3 \quad \text{Inequality 1}$$

$$y \geq x - 3 \quad \text{Inequality 2}$$

The graph of $y < -2x + 3$ is the half-plane *below* the *dashed* line $y = -2x + 3$.

The graph of $y \geq x - 3$ is the half-plane *on and above* the *solid* line $y = x - 3$.

The graph of the system is the intersection of the two half-planes shown as the darker shade of blue.

**EXERCISES**

Graph the system of linear inequalities. 28–30. See margin.

28. $y < x + 3$

$$y > -3x - 2$$

29. $y \leq -x - 2$

$$y > 4x + 1$$

30. $y \geq 0$

$$x \leq 2$$

$$y < x + 4$$

31. **MOVIE COSTS** You receive a \$40 gift card to a movie theater. A ticket to a matinee movie costs \$5, and a ticket to an evening movie costs \$8. Write and graph a system of inequalities for the number of tickets you can purchase using the gift card. Let m represent the number of matinee movies and n represent the number of evening movies. $5m + 8n \leq 40$, $m \geq 0$, $n \geq 0$, see margin for art.

Solve the linear system by graphing. Check your solution.

- | | | |
|--|--|--|
| 1. $3x - y = -6$ $(-1, 3)$
$x + y = 2$ | 2. $-2x + y = 5$ $(-2, 1)$
$x + y = -1$ | 3. $y = 4x + 4$ $(\frac{4}{11}, \frac{5}{11})$
$3x + 2y = 12$ |
| 4. $5x - 4y = 20$ $(4, 0)$
$x + 2y = 4$ | 5. $x + 3y = 9$ $(3, 2)$
$2x - y = 4$ | 6. $2x + 7y = 14$ $(-7, 4)$
$5x + 7y = -7$ |

Solve the linear system using substitution.

- | | | |
|--|---|--|
| 7. $y = 5x - 7$ $(6, 23)$
$-4x + y = -1$ | 8. $x = y - 11$ $(-17, -6)$
$x - 3y = 1$ | 9. $3x + y = -19$ $(-3, -10)$
$x - y = 7$ |
| 10. $15x + y = 70$ $(4, 10)$
$3x - 2y = -8$ | 11. $3y + x = 17$ $(3.5, 4.5)$
$x + y = 8$ | 12. $0.5x + y = 9$
$1.6x + 0.2y = 13$
$(\frac{7}{15}, \frac{5}{15})$ |

Solve the linear system using elimination.

- | | | |
|--|--|--|
| 13. $8x + 3y = -9$ $(-3, 5)$
$-8x + y = 29$ | 14. $x - 5y = -3$ $(7, 2)$
$3x - 5y = 11$ | 15. $4x + y = 17$ $(4, 1)$
$7y = 4x - 9$ |
| 16. $3x + 2y = -5$ $(3, -7)$
$x - y = 10$ | 17. $3y = x + 5$ $(16, 7)$
$-3x + 8y = 8$ | 18. $6x - 5y = 9$ $(4, 3)$
$9x - 7y = 15$ |

Tell whether the linear system has *one solution*, *no solution*, or *infinitely many solutions*.

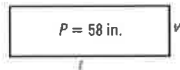
- | | | |
|--|---|---|
| 19. $15x - 3y = 12$
$y = 5x - 4$
infinitely many solutions | 20. $4x - y = -4$ no solution
$-8x + 2y = 2$ | 21. $-12x + 3y = 18$
$4x + y = -6$
one solution |
| 22. $6x - 7y = 5$
$-12x + 14y = 10$ no solution | 23. $3x - 4y = 24$ one solution
$3x + 4y = 24$ | 24. $10x - 2y = 14$
$15x - 3y = 21$
infinitely many solutions |

Graph the system of linear inequalities. 25–27. See margin.

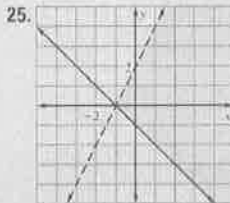
- | | | |
|-------------------------------------|------------------------------------|--|
| 25. $y < 2x + 2$
$y \geq -x - 1$ | 26. $y \leq 3x - 2$
$y > x + 4$ | 27. $y \leq 3$
$x > -1$
$y > 3x - 3$ |
|-------------------------------------|------------------------------------|--|

28. **TRUCK RENTALS** Carrie and Dave each rent the same size moving truck for one day. They pay a fee of x dollars for the truck and y dollars per mile they drive. Carrie drives 150 miles and pays \$215. Dave drives 120 miles and pays \$176. Find the amount of the fee and the cost per mile.
flat fee: \$20, cost per mile: \$1.30

29. **GEOMETRY** The rectangle has a perimeter P of 58 inches. The length ℓ is one more than 3 times the width w . Write and solve a system of linear equations to find the length and width of the rectangle.
 $2\ell + 2w = 58$, $\ell = 3w + 1$, $\ell = 22$ in., $w = 7$ in.



30. **COMMUNITY SERVICE** A town committee has a budget of \$75 to spend on snacks for the volunteers participating in a clean-up day. The committee chairperson decides to purchase granola bars and at least 50 bottles of water. Granola bars cost \$.50 each, and bottles of water cost \$.75 each. Write and graph a system of linear inequalities for the number of bottles of water and the number of granola bars that can be purchased. See margin.



Additional Resources

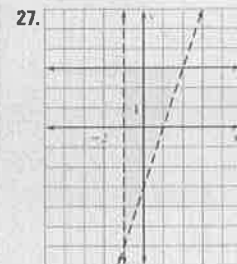
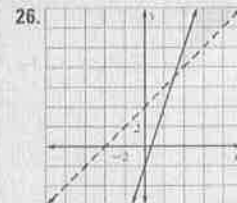
Assessment Book

- Chapter Test, Levels A, B, C, pp. 93–98
- Standardized Chapter Test, pp. 99–100
- SAT/ACT Chapter Test, pp. 101–102
- Alternative Assessment, pp. 103–104

Test Generator CD-ROM

Chapter Test

Easily-readable reduced copies (with answers) of Chapter Test B, the Standardized Chapter Test, and the Alternative Assessment from the Assessment Book can be found on pp. 424G–424H.



30. Let w represent the number of water bottles and g represent the number of granola bars; $w \geq 50$, $g \geq 0$, $0.5g + 0.75w \leq 75$.

