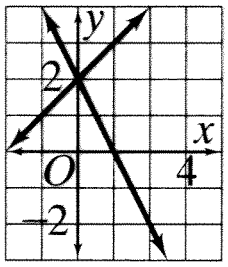
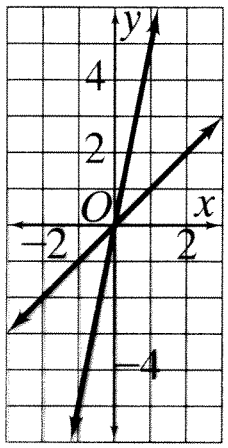
Answers for Lesson 7-1, pp. 377–379 Exercises

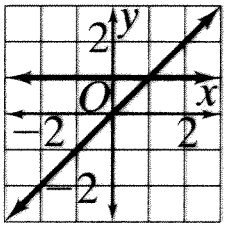
1. Yes, $(-1, 5)$ makes both equations true.
2. No, $(-1, 5)$ makes only one equation true.
3. Yes, $(-1, 5)$ makes both equations true.
4. Yes, $(-1, 5)$ makes both equations true.
5. $(0, 2)$;



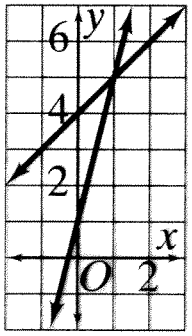
6. $(0, 0)$;



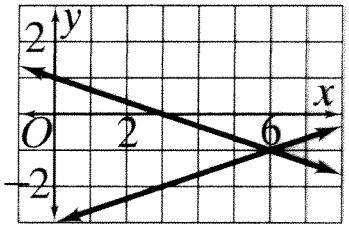
7. $(1, 1)$;



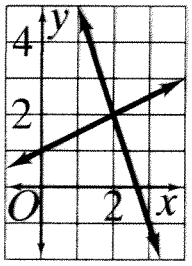
8. $(1, 5)$;



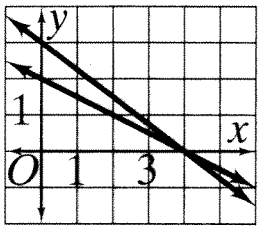
9. $(6, -1)$;



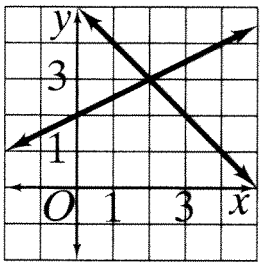
10. $(2, 2)$;



11. (4, 0);



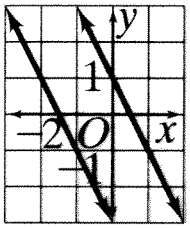
12. (2, 3);



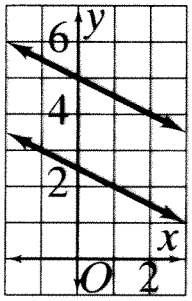
13. **a.** 3 weeks **b.** $35

14. 7 weeks

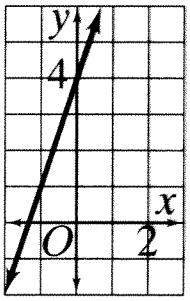
15. no solution;



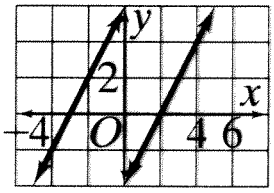
16. no solution;



17. infinitely many solutions;



18. no solution;



19. no solution; same slope, different y-int.

20. inf. many solutions; equivalent equations

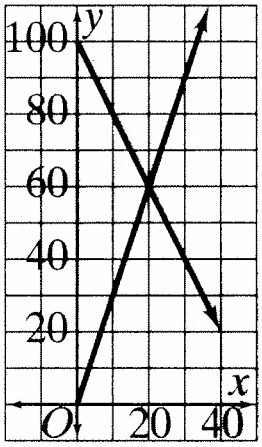
21. one solution; different slopes

22. inf. many solutions; equivalent equations

23. A

24. 5 min

25. (20, 60);

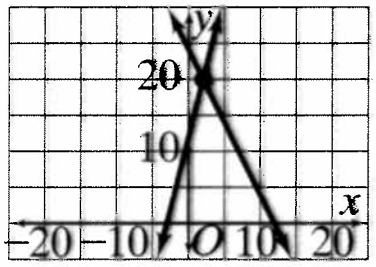


26. Answers may vary. Sample: $y = -1; x = 2$

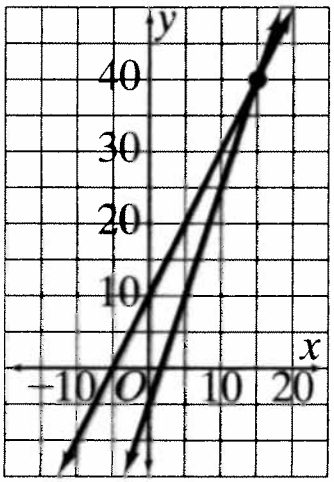
27. Answers may vary. Sample: $y = 2x - 1, y = 2x + 5$

28. Answers may vary. Sample: $x + y = 3, 3x + 3y = 9$

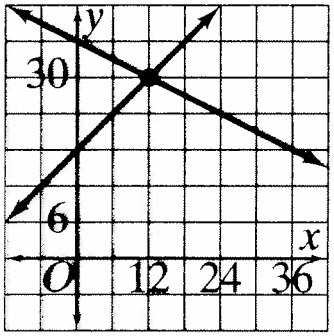
29. (2, 20)



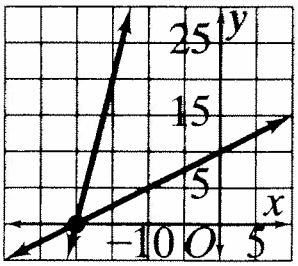
30. (15, 40)



31. (12, 30)



32. (−20, 0)



33. **a.** time on the horizontal and distance on the vertical

b. Red represents the tortoise because it shows distance changing steadily over time. Blue represents the hare because it is steeper than the other line at the ends but shows no change in distance while the hare is napping.

c. The point of intersection shows when the tortoise passed the sleeping hare.

34. $(-12, -16)$

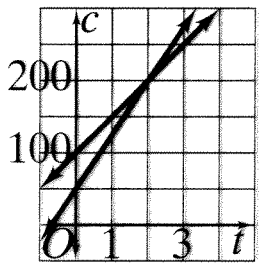
35. $(-2, 10)$

36. $(-30, -2.5)$

37. $(-0.9, 1.6)$

38. $(2, 3)$

39. **a.** $c = 100 + 50t$; $c = 50 + 75t$; $(2, 200)$;



b. The cost of renting either studio for 2 h is the same, \$200.

40. **a.** no values

b. $w \neq v$

c. $w = v$

41. **a.** sometimes

b. never

42. $(-9, -2)$

Answers for Lesson 7-2, pp. 384–386 Exercises

1. D **2.** C **3.** B

4. A

5–16. Coordinates given in alphabetical order.

5. $(9, 28)$ **6.** $(-\frac{1}{2}, -4\frac{1}{2})$ **7.** $(6\frac{1}{3}, -\frac{1}{3})$

8. $(2, 4\frac{1}{2})$ **9.** $(4, 20)$ **10.** $(\frac{3}{4}, 9\frac{3}{8})$

11. $(2, 0)$ **12.** $(7\frac{7}{17}, 11\frac{8}{17})$ **13.** $(6, -2)$

14. $(3, -2)$ **15.** $(8, -7)$ **16.** $(-3, 9.4)$

17. 4 cm by 13 cm **18.** 4 wk **19.** $(15, 15)$

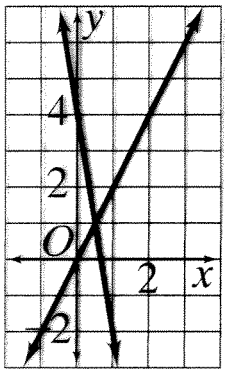
20. $(9, 126)$ **21.** $(-4, 4)$

22. 80 acres flax, 160 acres sunflowers

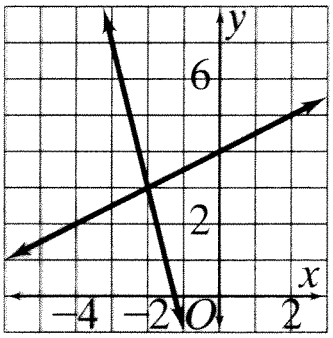
23. 15 video rentals

24. 9 yr

25. D

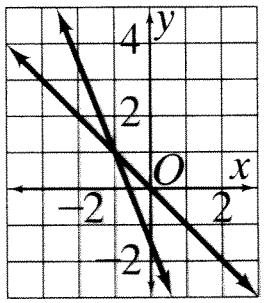
26. estimate: $(\frac{1}{2}, 1)$; 

; $(\frac{1}{2}, 1)$

27. estimate: $(-2, 3)$; 

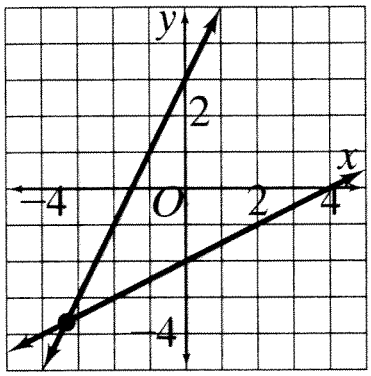
; $(-2, 3)$

28. estimate: $(-1, 1)$;



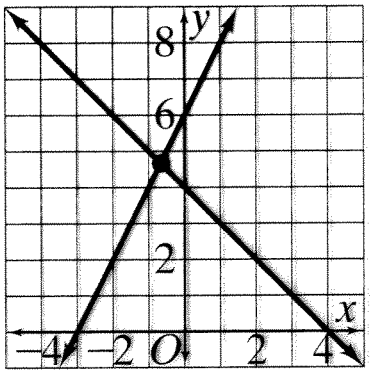
$(-1, 1)$

29. estimate: $(-3.5, -3.5)$;



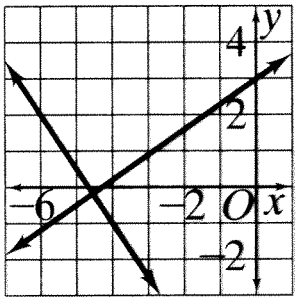
$(-\frac{10}{3}, -\frac{11}{3})$

30. estimate: $(-\frac{3}{4}, 4\frac{3}{4})$;



$(-\frac{2}{3}, \frac{14}{3})$

31. estimate: $(-4, 0)$;

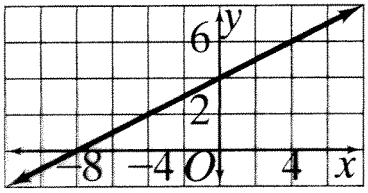


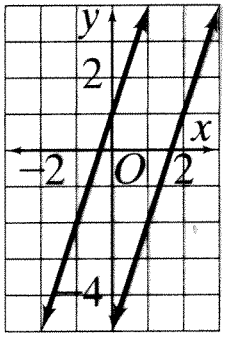
$(-\frac{50}{11}, -\frac{2}{11})$

32. Answers may vary. Sample: $y = x$ and $y = -3x + 2$; $(\frac{1}{2}, \frac{1}{2})$

33. **a.** (x, y) such that $y = 0.5x + 4$; no solution

b.





c. When there is exactly one solution, the graph will show two lines that intersect in a single point, and the substitution method will give the coordinates of the point. When there are infinitely many solutions, the graphs coincide, and substitution leads to an equation that is always true. When there are no solutions, the graphs are parallel, and substitution results in an equation that is never true.

34. $(2, 4)$ **35.** $(-\frac{1}{2}, -\frac{1}{2})$ **36.** $(2, -4)$

37. $(2, \frac{1}{2})$ **38.** $(-\frac{1}{2}, 0)$ **39.** $(4, -2)$

40. a. $g = \frac{23}{22}b$

b. $(b, g) = (572, 598)$

c. 26

41. a. $(t, d) = (9, 79.2)$

b. yes

Answers for Lesson 7-3, pp. 390–393 Exercises

1. $(1, 3)$ **2.** $(2, -2)$ **3.** $(5, -17)$

4. $(-3, 4)$ **5.** $(-9, \frac{1}{2})$ **6.** $(-\frac{1}{2}, 10)$

7. **a.** $x + y = 20, x - y = 4$

b. 12 and 8

8. **a.** $a + s = 456, 3.5a + s = 1131$

b. 270 adult, 186 student

9. $(-5, 1)$ **10.** $(11, -3)$ **11.** $(-2, -\frac{5}{2})$

12. $(1, 14)$ **13.** $(\frac{1}{2}, 1)$ **14.** $(-2, 3)$

15. **a.** $30w + \ell = 17.65, 20w + 3\ell = 25.65$

b. \$.39 for a wallet size, \$5.95 for an 8×10

16. **a.** x = burritos, y = tacos;
$3x + 4y = 11.33, 9x + 5y = 23.56$

b. \$1.79 for a burrito, \$1.49 for a taco

17. $(-1, -3)$ **18.** $(2.5, 1)$ **19.** $(2, -2)$

20. $(10, 8)$ **21.** $(-1, \frac{3}{2})$ **22.** $(1, 5)$

23–28. Methods may vary. Samples are given.

23. $(-1, -2)$; substitution; both solved for y

24. $(15, -10)$; elimination; equations not solved for y

25. $(10, 2)$; substitution; one eq. solved for x

26. $(-3, 11)$; elimination; eqs. not solved for a variable

27. $(5, 1)$; substitution; one eq. solved for x

28. $(\frac{1}{3}, 2\frac{1}{3})$; substitution; eqs. solved for y

29. one night: \$81.25; one meal: \$8.13

30. **a.** brass: \$6; steel: \$3

b. \$99

31. She forgot to multiply -8 by 6.

32. Answers may vary. Sample: $2x - 3y = 6, x + 3y = 9; (5, \frac{4}{3})$

33. $(10, -6)$

34. $(8, 12)$

35. $(-15, -1)$

36. $(20, 12)$

37. $(-2, 16)$

38. $(33, -48)$

39. 9

40. Answers may vary. Sample: You solve a system using the elimination method by adding or subtracting the eqs. to eliminate one of the variables. This sum or difference is one eq. with one variable that can be solved.

Use addition:	Use subtraction:	Use multiplication:
$3x + 2y = 6$	$5x + 3y = 15$	$4x + 5y = 20$
$-x - 2y = 4$	$5x - 2y = 10$	$2x - y = 10$

41. $B_1 = 3$ volts; $B_2 = 1.5$ volts

42. $(-3, 2)$

43. $(\frac{c}{a}, 0)$ $(a \neq 0, b \neq 1)$

44. $(8, 13, 20)$

45. CD: \$3.40, cassette: \$1.80

46. **a.** 27.02 g of gold

b. about 51.7%

Answers for Lesson 7-4, pp. 399–401 Exercises

1. a. $4a + 5b = 6.71$
   b. $5a + 3b = 7.12$
   c. pen: \$1.19, pencil: \$.39

2. D

3. a.

a	b	24
$0.04a$	$0.08b$	$0.05(24)$

   b. $a + b = 24; 0.04a + 0.08b = 1.2$
   c. 18 kg A, 6 kg B

4. a. at 8 wk
   b. \$160; \$62

5. 600 games

6. 40 T-shirts

7. a. $s + c = 2.75$
   b. $s - c = 1.5$
   c. 2.125 mi/h
   d. 0.625 mi/h

8. a. $(A + W)4.8 = 2100$
   $(A - W)5.6 = 2100$
   b. 406.25 mi/h
   c. 31.25 mi/h

9–14. Answers may vary. Samples are given.

9. Substitution; one eq. is solved for t.

10. Substitution; both eqs. are solved for y.

11. Elimination; subtract to eliminate m.

12. Substitution; both eqs. are solved for y.

13. Elimination; mult. first eq. by 3 and add to elim. y.

14. Substitution; one eq. is solved for u.

15. **a.** $t = 99 - 3.5m; t = 0 + 2.5m; t = 41.25°, m = 16.5$ min

b. After 16.5 min, the temp. of either piece will be 41.25°C.

16. 5 cm; 12 cm

17. Answers may vary. Sample: You have 10 coins, all dimes and quarters. The value of the coins is \$1.75. How many dimes do you have? How many quarters do you have?

$$q + d = 10$$
$$0.25q + 0.10d = 1.75$$

You have 5 dimes and 5 quarters.

18. 19 small mowers, 11 large mowers

19. **a.** 42 mi/h

b. 12 mi/h

20. **a.** $g = \frac{19}{17}b$

b. $g + b = 1908$

$$g = \frac{19}{17}b$$

901 boys, 1007 girls

21. **a.** 16 days

b. Answers may vary. Sample: If you plan to ski for many years, you should buy the equipment, since you will break even at 16 days.

22. $x = 2$
$y = 4$

23. 37

24. **a.** $2.50s + 4.00\ell = 10{,}000$

$\ell = \frac{5}{2}s$

800 small, 2000 large

b. 560 h

c. \$17.86/h

Answers for Lesson 7-5, pp. 407–409 Exercises

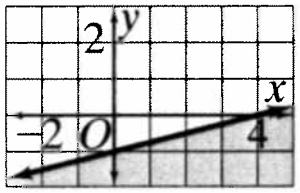
1. no **2.** yes **3.** yes

4. yes **5.** no **6.** yes

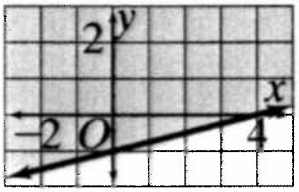
7. A **8.** B **9.** B

10. A

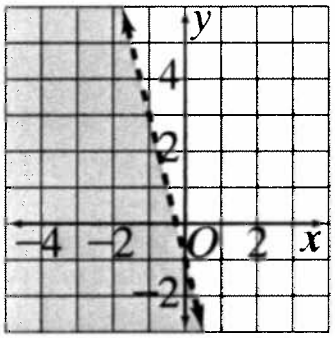
11.



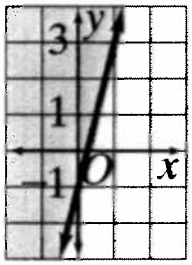
12.



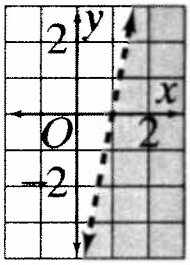
13.



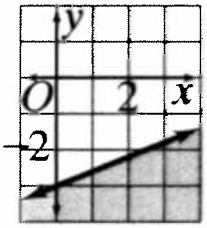
14.



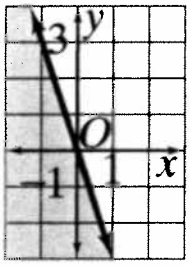
15.



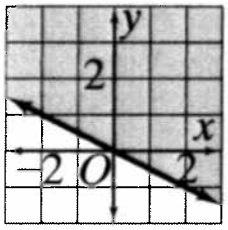
16.



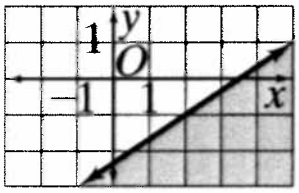
17.



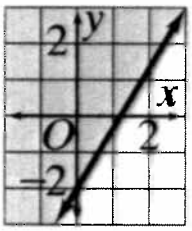
18.



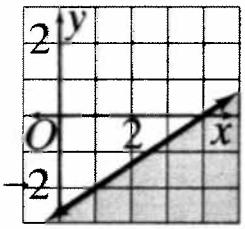
19. $y \leq \frac{2}{3}x - \frac{7}{3}$;



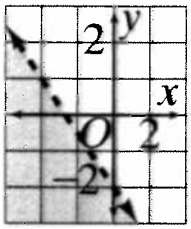
20. $y \geq \frac{5}{3}x - 2$;



21. $y \leq \frac{2}{3}x - \frac{8}{3}$;

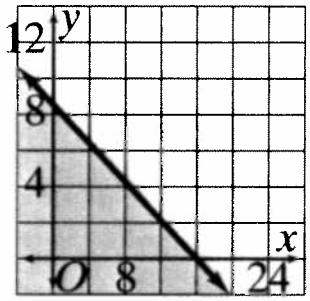


22. $y < -\frac{3}{2}x - 2$;



23. **a.** $3x + 5y \leq 48$

b.

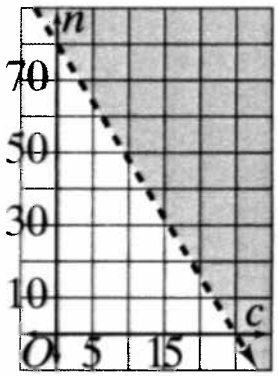


c. Answers may vary. Sample: 8 blue and 4 gold, 2 blue and 8 gold, 12 blue and 2 gold

d. No; you cannot buy −2 rolls of paper.

24. a. $3n + 10c > 250$

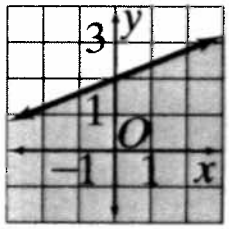
b.



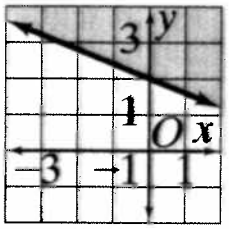
c. Answers may vary. Sample: 30 canvas and 10 nylon, 26 canvas and 20 nylon, 35 canvas and 10 nylon

d. Domain and range values must be positive integers, since you cannot buy portions of packs or a negative number of packs.

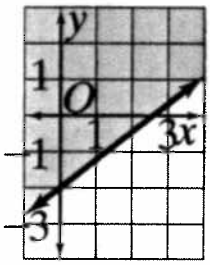
25.



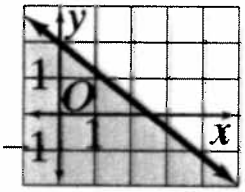
26.



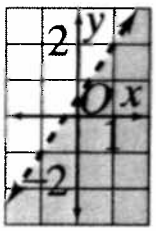
27.



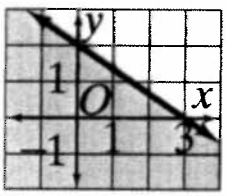
28.



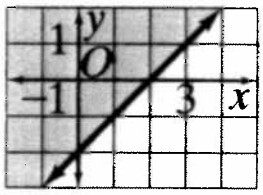
29.



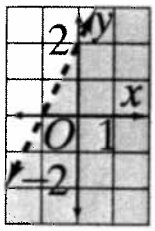
30.



31.



32.

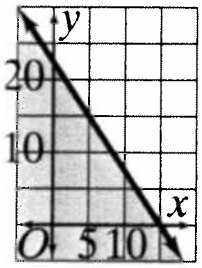


33. For an inequality written in the form $y <$ or $y \leq$, shade below the boundary line. For an inequality written in the form $y >$ or $y \geq$, shade above the boundary line.

34. $y > 2x - 1$ **35.** $x \leq -3$ **36.** $y \leq \frac{1}{3}x - 2$

37. **a.** $12x + 8y \leq 180$

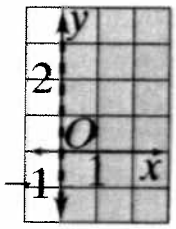
b.



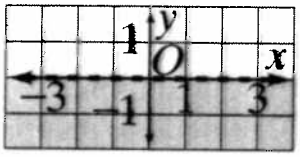
c. Yes; you can buy 8 CDs and 9 tapes.

d. 43

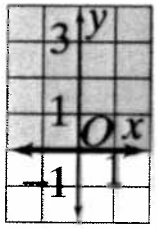
38. $x > 0$;



39. $y < 0$;



40. $y \geq 0$;

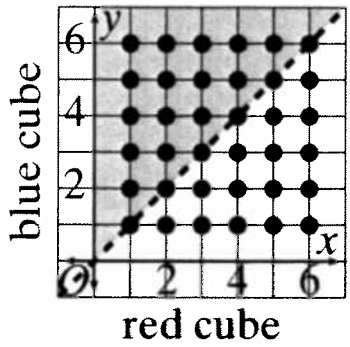


41. $x < y$;

42. It should be shaded above the line, and the line should be dashed.

43. $y < x + 2$

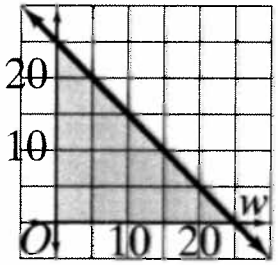
44. a.



b. $y > x$

c. $\frac{5}{12}$

45. a. $2w + 2\ell \leq 50; (w > 0, \ell > 0)$



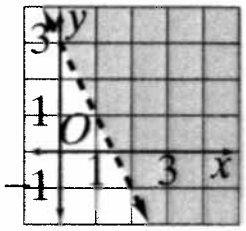
b. Answers may vary. Sample: 10 ft by 10 ft, 5 ft by 5 ft

c. No; (12, 15) is not in the shaded region and is not a sol. of the inequality.

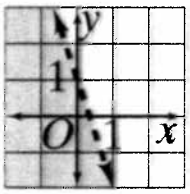
46. $y < x - 3$

47. $y \geq 2x - 2$

48. a. Answers may vary. Sample: $2x + y > 3$



b. Answers may vary. Sample: $3x + y < 1$



c. If an inequality is in standard form, where A, B, and C are all positive, you shade above the line for $>$ or $\geq$ and below the line for $<$ or $\leq$.

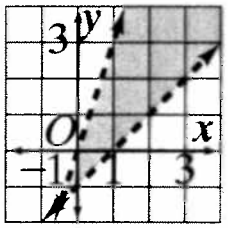
d. yes

49. a. yes

b. yes

c. Answers may vary. Sample: (2, 3)

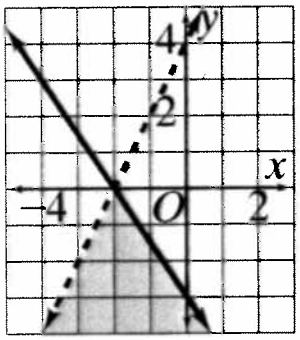
d.



Answers for Lesson 7-6, pp. 414–417 Exercises

1. no **2.** yes **3.** no

4.



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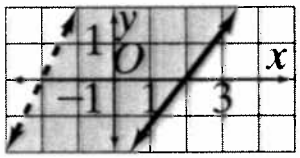
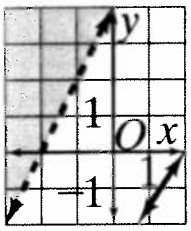
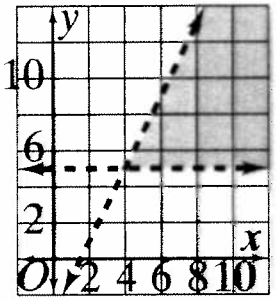


6.

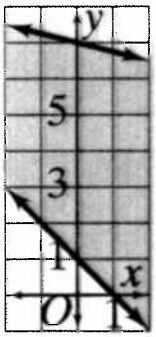


7.

8.

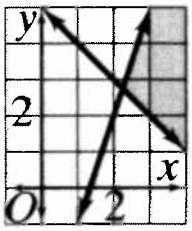


9.

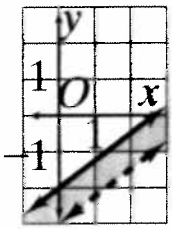


10.

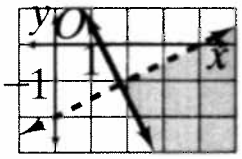
11.



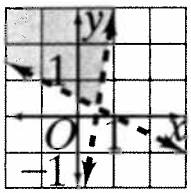
12.



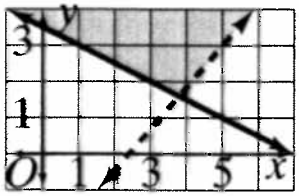
13.



14.



15.



16. $x > 5$ and $y \geq -x + 3$

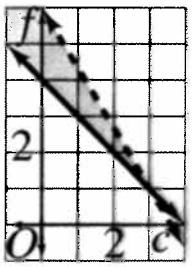
17. $y \geq -\frac{1}{2}x - 2$ and $y \leq \frac{1}{2}x + 2$

18. $y \geq -\frac{1}{5}x + 1$ and $y \geq -\frac{3}{4}x + 3$

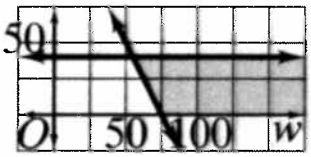
19. $y \leq -\frac{2}{3}x - 4$ and $y \geq \frac{1}{5}x - 3$

20. **a.** $1.5f + 2.5c < 9.50, f + c \geq 4$

b.

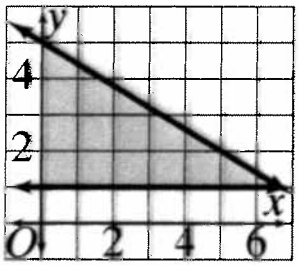


21.



22. **a.** $5.99x + 9.99y \leq 50, x \geq 0, y \geq 1$

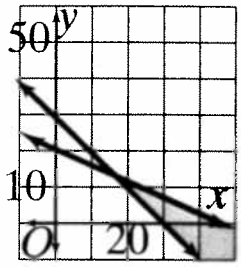
b.



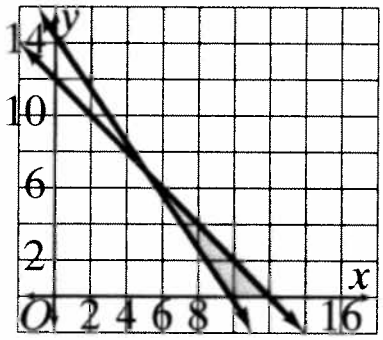
c. 2 books and 6 CDs; no, (2, 6) is not in the shaded region.

d. Answers may vary. Sample: 3 books and 3 CDs for $47.94

23. $x + y \geq 30, 1.25x + 3y \leq 60$



24. a. $x + y \leq 12, 6x + 4y \geq 60$



b. Answers may vary. Sample: (8, 3), (9, 1), (10, 0)

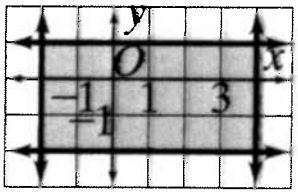
25. $x \leq 3, x \geq -3, y \leq 3, y \geq -3$

26. $y \geq 2, x < 5, y \leq x$

27. $y \geq \frac{2}{3}x - 2, y < \frac{2}{3}x + 2$

28. $y \geq -x - 3, y \leq -x + 3, y \leq x + 3, y \geq x - 3$

29. Answers may vary. Sample: $x \geq -2, x \leq 4, y \leq 1, y \geq -2$



30. a. -1 **b.** 8 units^2

31. a. triangle **b.** $(2, 2), (-4, -1), (-4, 2)$ **c.** 9 units^2

32. a. square

b. $(1, -1), (5, -1), (1, 3), (5, 3)$

c. 16 units^2

33. a. trapezoid

b. $(0, -4), (0, 2), (2, -4), (2, 0)$

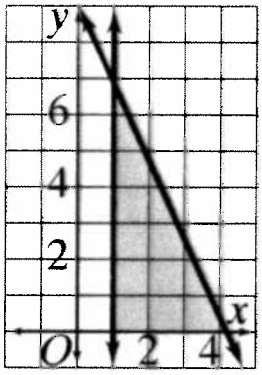
c. 10 units^2

34. a. triangle

b. $(2, -3), (2, 2), (7, -3)$

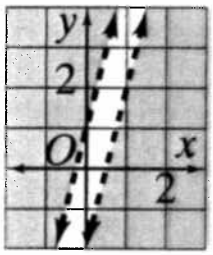
c. 12.5 units^2

35. a. $x \geq 1, y \geq \emptyset, 10.99x + 4.99y \leq 45$



b. $(3, 0), (3, 1), (3, 2), (4, 0)$

36. a.

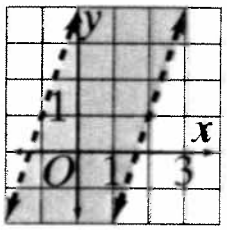


b. No; they are parallel.

c. no

d. no

37. a.



b. No; they are parallel.

c. It is a strip between the lines.

38–42. Answers may vary. Samples are given.

38. $x \leq 1$ and $y \leq 2$

39. $x < 0$ and $y > 0$

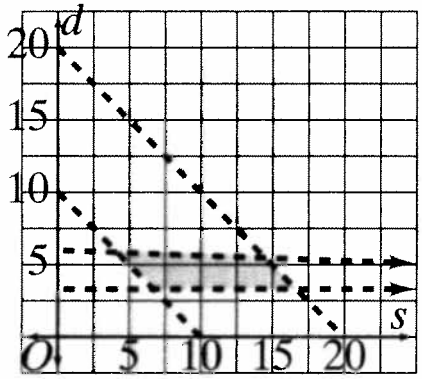
40. $y > 5$ and $y < 3$

41. $x < 2$ and $y < 5$

42. $x > 0$ and $y < 0$

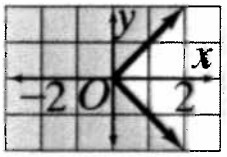
43. D

44. a. $s + d > 10, s + d < 20, d \geq 3, 10d + 0.15s < 60$



b. Answers may vary. Sample: (8, 4.5); 12.5g; gold: \$45.00, silver: \$1.20

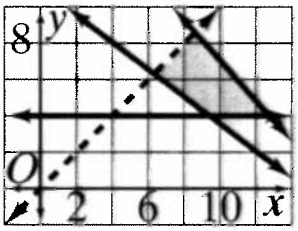
45.



46. Answers may vary.
$y > \frac{1}{2}x$
$y < 2x$

47. Answers may vary.
$y > x + 1$
$y > -x + 1$

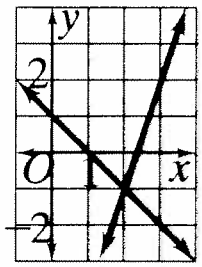
48. a. $180x + 240y \geq 2700$
$x + y \leq 17$
$x > y$
$y \geq 4$



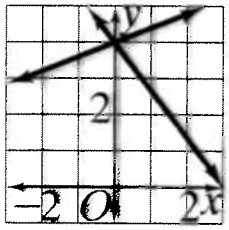
b. Answers may vary. Sample: ten 14-in. drums and six 18-in. drums

Answers for Chapter Test, p. 424

1. $(2, -1)$



2. $(0, 4)$



3. one **4.** one **5.** none

6. one **7.** one **8.** inf. many

9. $(8, 25)$ **10.** $(3, -7)$ **11.** $(2, -9)$

12. $(3.5, 1)$ **13.** $(8, -24)$ **14.** $\left(11, -\frac{2}{5}\right)$

15. $(6, 4)$ **16.** $(-5, -2)$

17. $b + m = 35, b + 2m = 45$; \$25; \$10

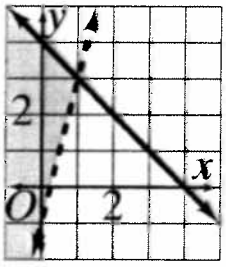
18. $\frac{n}{p} = \frac{5}{3}, n + p = 24$; 15 novelists, 9 poets

19. $q + n = 15, 0.25q + 0.05n = 2.75$; 10 quarters, 5 nickels

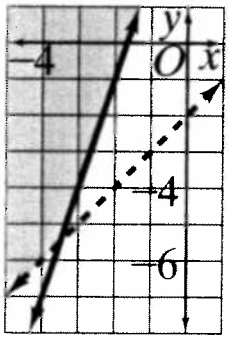
20. Answers may vary. Sample: You solve a system of linear equations by finding a single point that satisfies all the equations in the system. You solve a system of linear inequalities by graphing a region that contains points that satisfy all the inequalities in the system.

21. C

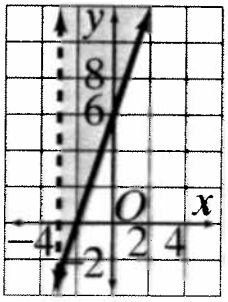
22.



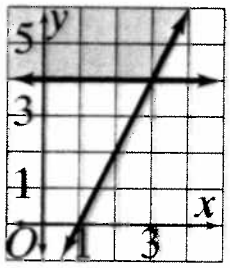
23.



24.

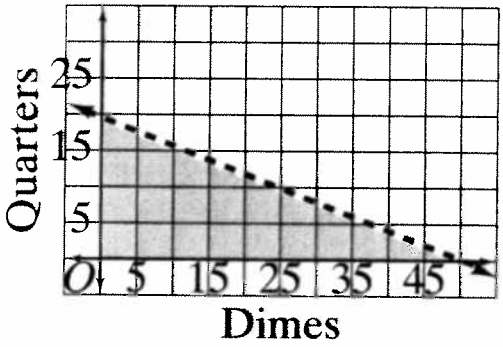


25.



26. Answers may vary. Sample: $y = x + 1$, $y = 3x - 5$; $(3, 4)$

27. **a.** $0.10d + 0.25q < 5.00$;

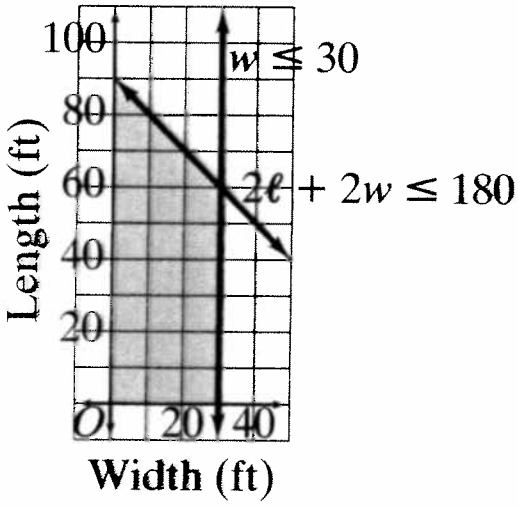


b. 49 items

c. 19 items

28. **a.** $w \leq 30, 2\ell + 2w \leq 180$

b.



29. a.

	30% insecticide	50% insecticide	42% insecticide
Liters of solution	x	y	200
Liters of insecticide	$0.30x$	$0.50y$	$0.42(200)$

b. $x + y = 200, 0.3x + 0.5y = 84$; 120 liters of 50% insecticide and 80 liters of 30% insecticide