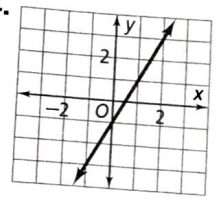
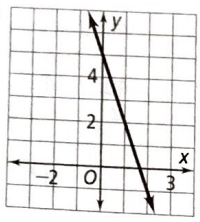
42–43. Answers may vary. Samples are given.

42. $y = 0.25x + 5.05$ **43.** $y = 12.5x$

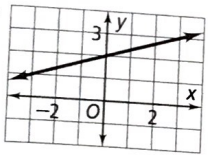
44.



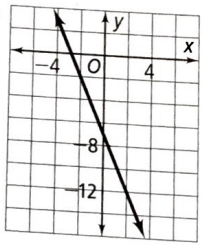
45.



46.



47.

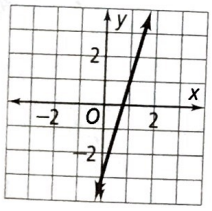


Chapter Review

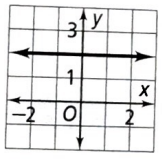
pp. 353–356

1. interpolation **2.** rate of change **3.** point-slope form **4.** opposite reciprocals **5.** line of best fit **6.** -1 **7.** 0 **8.** 3 **9.** undefined **10.** 3 **11.** $-\frac{1}{2}$ **12.** $y = -2x$; -14 **13.** $y = \frac{5}{2}x$; $\frac{35}{2}$ **14.** $y = \frac{1}{3}x$; $\frac{7}{3}$ **15.** $y = -x$; -7 **16.** no **17.** yes; $y = -2.5x$ **18.** $y = 4$ **19.** $y = x - 5$ **20.** $y = \frac{2}{3}x + 1$ **21.** $y = -x - 1$

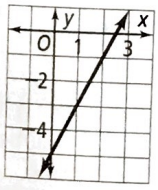
22.



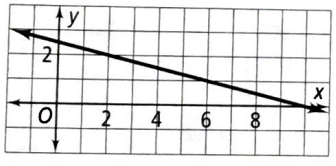
23.



24.

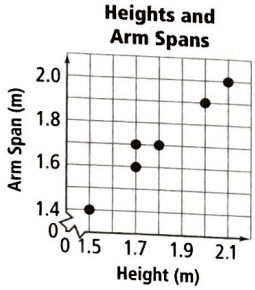


25.



26. $y = 5x - 11$ **27.** $y = 9x - 5$ **28.** Parallel; the slopes are equal. **29.** Neither; the slopes are not equal or opposite reciprocals. **30.** $y = \frac{1}{3}x + 4$ **31.** $y = -\frac{1}{8}x + \frac{21}{2}$ **32.** negative correlation **33.** no correlation **34.** positive correlation

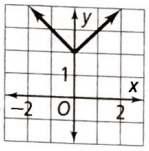
35a.



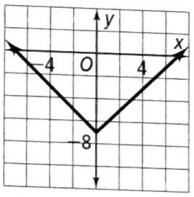
b–d. Answers may vary. Samples are given.

b. $y = 0.96x - 0.01$ **c.** about 1.5 m **d.** about 2.1 m

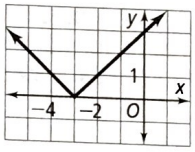
36.



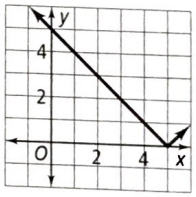
37.



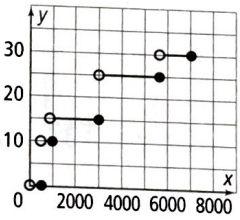
38.



39.



40.



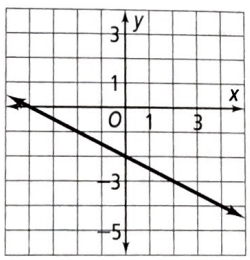
Chapter 6

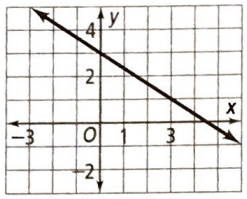
Get Ready!

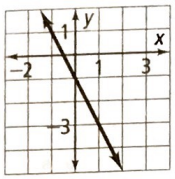
p. 361

1. identity **2.** 1 **3.** no solution **4.** 3 **5.** 1.5 **6.** no solution **7.** $x < 3$ **8.** $r \leq 35$ **9.** $t > -13$ **10.** $f \geq -2$ **11.** $s > \frac{5}{23}$ **12.** $x \geq -18$ **13a.** $2x - 1$ **b.** $A = \frac{1}{2}x(2x - 1)$ **c.** 248 cm^2

14.



15. 

16. 

17. inconsistent **18.** deletes

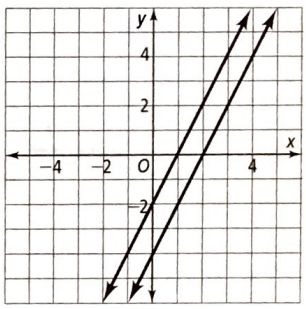
Lesson 6-1 pp. 364–370

Got It? 1. $(-2, 0)$ **2.** 5 months **3a.** no solution **b.** infinitely many solutions **c.** Systems with one solution have lines with different slopes. Systems with no solutions have the same slope but different y-intercepts. Systems with infinitely many solutions have the same slope and the same y-intercept.

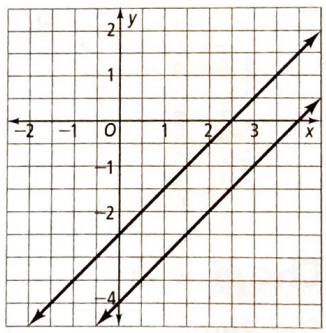
Lesson Check 1. $(6, 13)$ **2.** $(16, 14)$ **3.** $(-1, 0)$ **4.** $(-1, -3)$ **5a.** $c = 10t + 8$; $c = 12t$ **b.** (4, 48); the cost is the same whether you buy 4 tickets for a cost of \$48 online or at the door. **6.** A, III; B, II; C, I **7.** No; a solution to the system must be on both lines. **8.** No; two lines intersect in no points, one point, or an infinite number of points. **9.** The graphs of the equations both contain the point $(-2, 3)$.

Exercises 11. $(4, 9)$ **13.** $(2, -2)$ **15.** $(-3, -11)$ **17.** $(-1, 3)$ **19.** 27 students; 3 students **21.** 10 classes

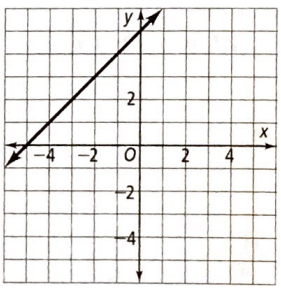
23. no solution



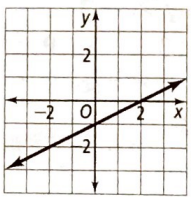
25. no solution



27. infinitely many solutions



29. infinitely many solutions



31. 13 h

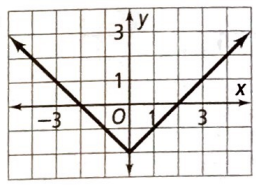
33. You should substitute the values of x and y into both equations to make sure that true statements result.

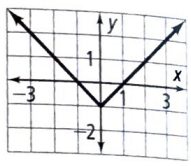
35. No solution; the lines have the same slope and different y-intercepts so they are parallel.

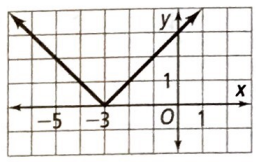
37. Infinitely many solutions; the lines are the same.

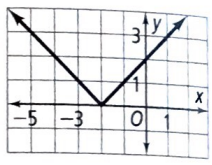
39. $b = 2.5t + 40$, $b = 5t$; 16 weeks

41a. Sometimes; if $g > h$, the lines intersect at one point, but if $g = h$, the lines never intersect. **b.** Never; if $g < h$, the lines intersect at one point, but if $g = h$, the lines never intersect. **43.** A **45a.** $C = 20$, $C = 2.5h + 5$ **b.** 6 h **c.** Garage A; it costs less for the time given.

46. 

47. 

48. 

49. 

50. 1 **51.** $-\frac{1}{2}$ **52.** $-\frac{2}{3}$ **53.** $\frac{3}{5}$ **54.** $y = -2x + 19$ **55.** $y = -\frac{3}{2}x + 15$ **56.** $y = \frac{8}{15}x$ **57.** $y = \frac{1}{3}x - \frac{14}{3}$

Lesson 6-2 pp. 371–377

Got It? 1. $(-8, -9)$ **2a.** $\left(7\frac{1}{3}, -4\frac{7}{9}\right)$ **b.** x; $x + 3y = -7$ **3.** 5 new games **4.** infinitely many

Lesson Check 1. $\left(25\frac{5}{11}, 6\frac{4}{11}\right)$ **2.** (3, 5) **3.** no solution **4.** no solution **5.** 7 singing, 5 comedy **6.** Answers may vary. Sample: Graphing a system can be inexact, and it is very difficult to read the intersection, especially when there are noninteger solutions. The substitution method is better, as it can always give an exact answer.

7. $-2x + y = -1$ because it is easily solved for y.

8. $6x - y = 1$ because it is easily solved for y. **9.** False; it has infinitely many solutions. **10.** False; you can use it, but the arithmetic may be harder.

Exercises 11. (2, 6) **13.** $\left(-\frac{5}{7}, 2\frac{2}{7}\right)$ **15.** (3, 0) **17.** $(-11, -19)$ **19.** $(-12, -5)$ **21.** $\left(0, -\frac{1}{2}\right)$

23. 2 children, 9 adults **25.** 18°, 72° **27.** infinitely many solutions **29.** infinitely many solutions **31.** one solution **33.** Solve $1.2x + y = 2$ for y because then you can solve the system using substitution. **35.** The student solved an equation for x but then substituted it into the same equation, not the other equation.

$$x + 8y = 21, \text{ so } x = 21 - 8y$$
$$7(21 - 8y) + 5y = 14$$
$$147 - 56y + 5y = 14$$
$$-51y = -133$$
$$y = \frac{-133}{-51} = 2\frac{31}{51}$$

So, $x = 21 - 8\left(2\frac{31}{51}\right) = 21 - \frac{1064}{51} = \frac{7}{51}$

The solution is $\left(\frac{7}{51}, 2\frac{31}{51}\right)$.

37. 20 more girls **39.** 2.75 s **41.** Answers may vary.

Sample: Solve the first equation, $y + x = x$, for y, so $y = x - x = 0$. But the second equation is not defined for $y = 0$; therefore, there is no solution. **43a.** 25 s after Pam starts, 26 s after Michelle starts **b.** Yes; 26 s after Michelle starts, both runners will be at 195 m. Pam, who is running at a faster rate, will go on to win.

Lesson 6-3 pp. 378–386

Got It? 1a. (2, 7) **b.** (−1, −2) **2.** car: 20 min; truck: 30 min **3a.** Sample answer: You can multiply the first equation by 3 to eliminate the y.

b. Sample answer: $-15x - 6y = 18$; (−2, 2)
$3x + 6y = 6$

c. $-5(-2) - 2(2) = 6$; $3(-2) + 6(2) = 6$
$10 - 4 = 6$ $-6 + 12 = 6$

4a. Sample answer: You can multiply the first equation by 3 and multiply the second equation by −4 to eliminate x.

b. Sample answer: $12x + 9y = -57$; $-12x + 8y = 40$; (−4, −1)

c. $4(-4) + 3(-1) = -19$ and $3(-4) - 2(-1) = -10$
$-16 - 3 = -19$ $-12 + 2 = -10$

5. no solution

Lesson Check 1. (2, 3) **2.** (1, 4) **3.** $\left(\frac{7}{25}, -\frac{2}{25}\right)$ **4.** Elimination; the objective of the elimination method is to add (or subtract) two equations to eliminate a variable. **5.** The Addition Property of Equality says that adding equals to equals gives you equals. This is what you are doing in the elimination method. **6.** Answers may vary. Sample: Decide which variable to eliminate, and then multiply, if necessary, one or both equations so that the coefficients of the variable are the same (or opposites). Then subtract (or add) the two equations. This will result in one equation with a single variable that you can solve. Then substitute to find the value of the other variable.

Exercises 7. (4, 5) **9.** (1, 5) **11.** (3, 15)
13a. $12x + 2y = 90$, $6x + 2y = 60$ **b.** solo act: 5 min; ensemble act: 15 min
15. (3, 1) **17.** (5, 3) **19.** (2, −1) **21.** no solution
23. one solution **25.** infinitely many solutions **27.** \$12; \$7
29. The student forgot to multiply the constant in the second equation by 4.
$15x + 12y = 6$
$12x + 12y = -12$
so, $3x = 18$
$x = 6$
31. Answers may vary. Sample:
$3x - 2y = 7$
$5x + 2y = 33$
Because the coefficients of the y-terms are already opposites, simply add the two equations to get $8x = 40$, or $x = 5$. Substitute $x = 5$ into either equation to get $y = 4$. The solution is (5, 4).
33. (2, 0); answers may vary. Sample: Substitution; the first equation is easily solved for y. **35.** (6, 5); answers may vary. Sample: Substitution; the first equation is already solved for y. **37.** (6, −4); answers may vary. Sample: Elimination; you can multiply each equation by the LCD of the denominators to eliminate the fractions. Then you can use elimination. **39.** parasailing: \$51; horseback riding: \$30 **41.** $\left(2, \frac{1}{2}\right)$ **43.** (5, 3, −1) **45.** 7 **47.** 5.46
49. 390 **50.** (7, 3.5) **51.** (34, 27) **52.** (5, −3) **53.** $a > 1$
54. $x \geq 7$ **55.** $b > 0.2$ **56.** 2.75 h

Lesson 6-4 pp. 387–392

Got It? 1. 720 books **2.** The tanks will never have the same amount of water because the solution to the system is (−2, 14), which is not a viable solution because it is not possible to have time be −2 hours. **3a.** 3.5 mi/h; 1.5 mi/h **b.** You will be pushed backward.

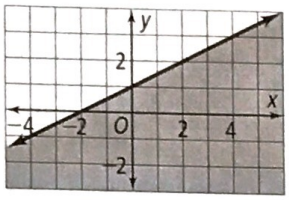
Lesson Check 1. 300 copies **2.** 1 kg of 30% gold, 3 kg of 10% gold **3.** 2.25 mi/h; 0.75 mi/h **4.** Before the break-even point, expenses exceed income. After the break-even point, income exceeds expenses. **5.** Answers may vary. Sample: elimination; neither equation is easily solved for a variable. **6.** You would need more of the 15% brand, since 25% is closer to 15% than 40%.

Exercises 7. 40 bicycles **9.** \$950 at 5% and \$550 at 4%; Let x represent the amount of money invested at 5% and let y represent the amount of money invested at 4%. The solution to the system is (950, 550).
11. 4 ft/s; 2 ft/s
13a. Let x = the number of pennies and let y = the number of quarters.
$x + y = 15$
$0.01x + 0.25y = 4.35$
The solution is 17.5 quarters and −2.5 pennies.
b. No; you cannot have a negative number of coins.
15. (−3, −2); substitution because the second equation is already solved for y **17.** $A = -3$ and $B = -2$.
19–21. Answers may vary. Samples are given.
19. Substitution; both equations are already solved for y, so you can set them equal. **21.** Substitution; the second equation is already solved for y. **23.** $66\frac{2}{3}$ mL of the 5% mixture; $133\frac{1}{3}$ mL of the 6.5% mixture **25.** It can also be solved by the elimination method because the variables are lined up and the coefficients of the y-terms are the same. So one would simply have to subtract the second equation. **27.** 37 **29.** C **31.** The slope of the line is $\frac{3-1}{4-3} = 2$. So $y - 1 = 2(x - 3)$, or $y - 1 = 2x - 6$. The equation of the line passing through the points (3, 1) and (4, 3) is $y = 2x - 5$. **32.** (−7, 6) **33.** (−2, −2)
34. (4, 2.5) **35.** $a > 5$ **36.** $d \leq -2.5$ **37.** $q \leq -4$

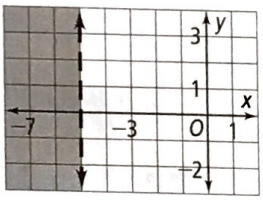
Lesson 6-5 pp. 394–399

Got It? 1a. yes **b.** No; it could be on the line $y = x + 10$.

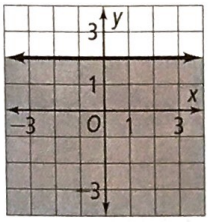
2.



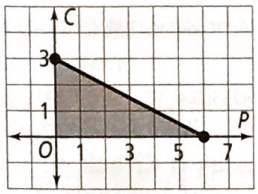
3a.



b.



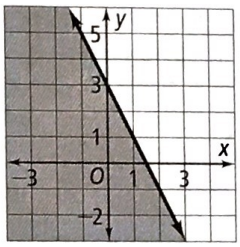
4. Answers may vary. Sample: 0 lb of peanuts and 3 lb of cashews; 6 lb of peanuts and 0 lb of cashews; 1 lb of peanuts and 1 lb of cashews



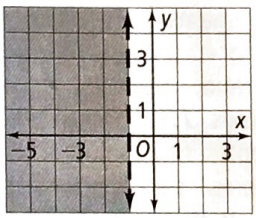
5. $y > \frac{1}{3}x - 2$

Lesson Check **1.** no

2.



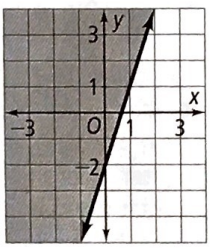
3.



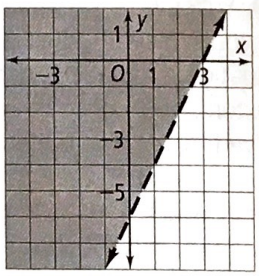
4. $y < \frac{1}{2}x - 1$ **5.** Answers will vary. Sample: The solutions of a linear equation and a linear inequality are coordinates of the points that make the equation or inequality true. The graph of a linear equation is a line, but the graph of a linear inequality is a region of the coordinate plane. **6.** Since the inequality is already solved for y, the $<$ symbol means you should shade below the boundary line. All of these shaded points will make the inequality true. **7.** $y \geq 5x + 1$

Exercises **9.** solution **11.** solution **13.** solution

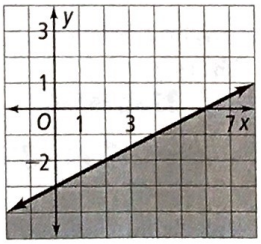
15.



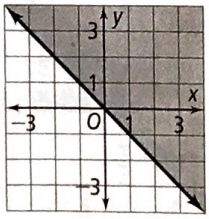
17.



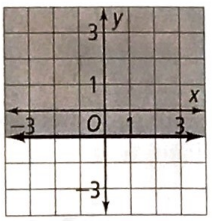
19.



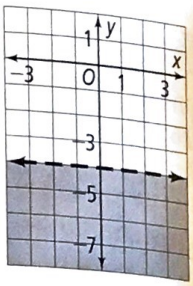
21.



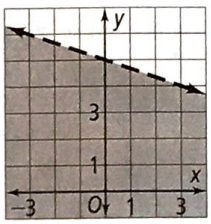
23.



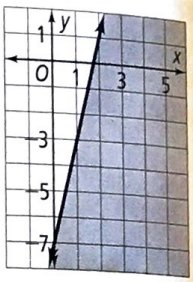
25.



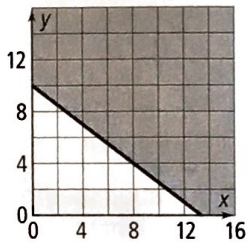
27.



29.

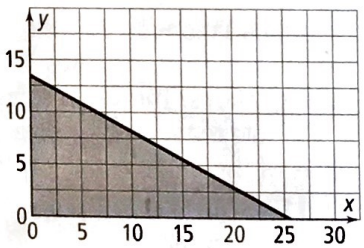


31. $9x + 12y \geq 120$



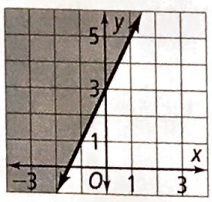
Answers may vary. Sample: 4 lb of cod and 12 lb of flounder; 10 lb of cod and 10 lb of flounder; 12 lb of cod and 4 lb of flounder

33. $y > \frac{3}{2}x - 3$ **35.** $250x + 475y \leq 6400$, where x represents the number of refrigerators and y represents the number of pianos



Yes; the point (12, 8) is not in the shaded region.

37. The student graphed $y \leq 2x + 3$ instead of $y \geq 2x + 3$. The other side of the line should be shaded.

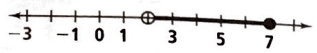


39. $-5x + 1.5y \geq -10$, where x is the number of CDs bought and y is the number sold; actual solutions include only points representing whole numbers of CDs bought and sold. The graph is a line in the first quadrant; passing through (2, 0) and (5, 10) and is shaded to the left.

41. The slope must be negative; in order for the point (3, 2) to be above the line and the point (1, 2) to be below the line, the boundary line must be sloping

downward. If the line had a positive slope, sloping upward, then the point (1, 2) would be above the line and would satisfy $y > mx + b$, which is not what is given. **43.** G **45.** 96 days

46. $2 < x \leq 7$

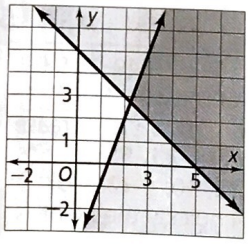


47. one solution: (−6, −9) **48.** one solution: (2, 0)
49. no solution

Lesson 6-6 pp. 400–405

Got It?

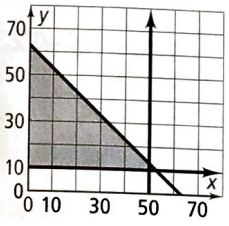
1.



2a. $y < -\frac{1}{2}x + 1$
$y \leq \frac{1}{2}x + 1$

b. No; the red line is dashed so points on that line are not included in the solution.

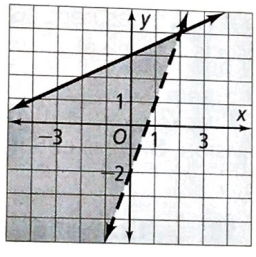
3.



$2x + 2y \leq 126$,
$x \leq 50$, $y \geq 10$

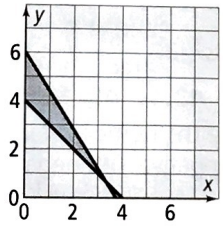
Lesson Check

1.



2. $y \geq 3x + 3$
$y < -x - 2$

3.

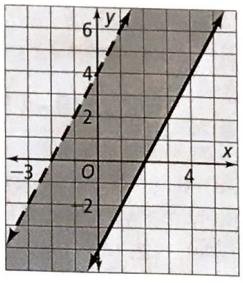


4. You can substitute the ordered pair into each inequality to make sure that it makes each true. **5.** Not necessarily; as long as there is some overlap of the half-planes, then the system will have a solution. **6.** You need to find the intersection of each of the two systems, but the intersections of lines will be a point or line and the intersections of inequalities will be a line or a planar section.

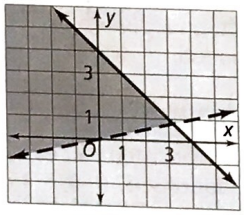
Exercises

7. yes **9.** no

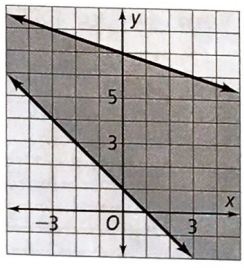
11.



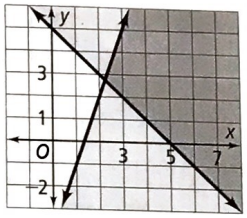
13.



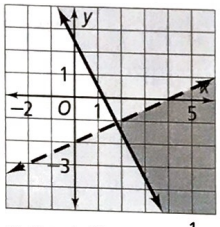
15.



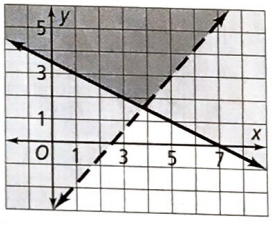
17.



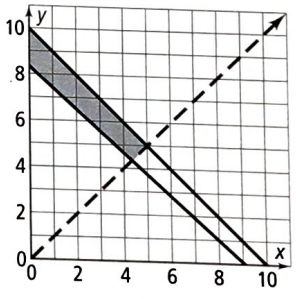
19.



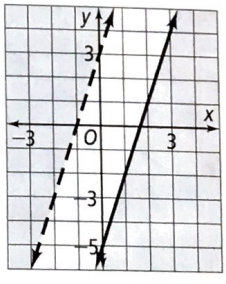
21.



23. $y \leq x + 2$, $y < -\frac{1}{3}x$ **25.** $y \geq 2$, $y > x + 1$
27. Let x = hours driven by slower driver, let y = hours driven by faster driver.



29a.



b. No; they have the same slope and different y-intercepts, so they will never intersect. **c.** no
d. No; there are no points that satisfy both inequalities.

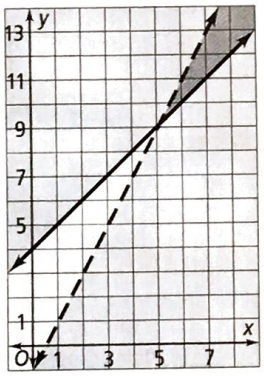
31. You can buy 5 T-shirts and 1 dress shirt or 2 T-shirts and 3 dress shirts. **33.** C **35.** Check students' work.
37. The graph shows two lines, one passing through (1, 1)

and $(-1, -1)$ and the other passing through $(-1, 1)$ and $(1, -1)$. Four triangles are formed by these lines; upper, left, and lower ones are shaded. Right triangle is not shaded.

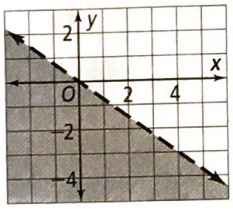
Chapter Review pp. 408–410

1. inconsistent **2.** elimination **3.** system of linear equations **4.** $(-8, -11)$ **5.** $(-2, 6)$ **6.** $(-3, -3)$ **7.** no solution **8.** $\left(-\frac{14}{3}, -\frac{35}{3}\right)$ **9.** infinitely many solutions **10.** 4 yr **11.** The lines will be parallel. **12.** $(4, 7)$ **13.** $(3, -10)$ **14.** no solution **15.** $(-1, -2)$ **16.** infinitely many solutions **17.** $\left(-\frac{11}{17}, -\frac{188}{17}\right)$ **18.** \$55 **19.** no solution **20.** $(-1, 13)$ **21.** $(-11, -7)$ **22.** $(5, 12)$ **23.** $(4.5, 3)$ **24.** infinitely many solutions **25.** small centerpiece: 25 min, large centerpiece: 40 min

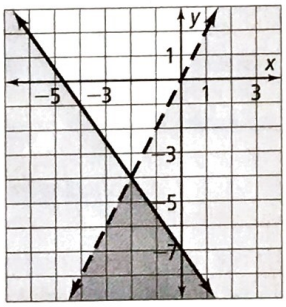
26.



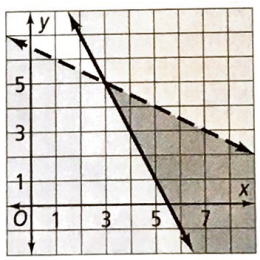
27.



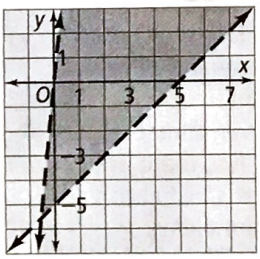
28.



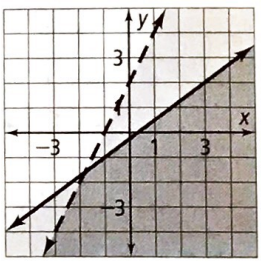
29.



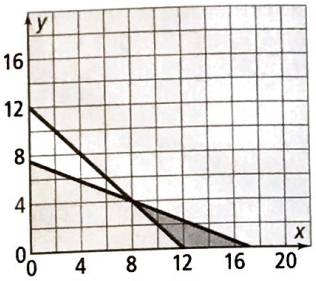
30.



31.



32.



Chapter 7

Get Ready! p. 415

1. 0.7 **2.** 6.4 **3.** 0.008 **4.** 3.5 **5.** $0.\overline{27}$ **6.** 49 **7.** 5.09 **8.** 0.75 **9.** 4 **10.** 16 **11.** 4 **12.** 2000 **13.** −147 **14.** 100 **15.** 49 **16.** 117 **17.** −31 **18.** 33% increase **19.** 25% decrease **20.** 17% decrease **21.** 5% increase **22.** $\{-8, 0, -24.5\}$ **23.** $\{18, 10, -32.875\}$ **24.** $\{-11, -1, 16.5\}$ **25.** yes; how quickly the plant grows **26.** The quantity would increase rapidly. **27.** decreasing

Lesson 7-1 pp. 418–423

Got It? 1a. $\frac{1}{64}$ **b.** 1 **c.** $\frac{1}{9}$ **d.** $\frac{1}{6}$ **e.** $\frac{1}{16}$ **2a.** $\frac{1}{x^9}$ **b.** n^3 **c.** $\frac{4b}{c^3}$ **d.** $2a^3$ **e.** $\frac{1}{m^2n^5}$ **3a.** $\frac{1}{16}$ **b.** $-\frac{1}{50}$ **c.** $\frac{1}{15{,}625}$ **d.** $-\frac{5}{2}$ **e.** It is easier to simplify first. That gives you, $1 \times 1 = 1$. **4.** 600 represents the number of insects 2 weeks before the population was measured; 5400 represents the population when it was measured; 16,200 represents the number of insects 1 week after the population was measured.

Lesson Check 1. $\frac{1}{32}$ **2.** 1, $m \neq 0$ **3.** $\frac{5s^2}{t}$ **4.** $4x^3$ **5.** −2 **6.** $\frac{1}{8}$ **7.** division **8.** b^0 is equal to 1, not 0; $\frac{x^n}{a^{-n}b^0} = \frac{a^n x^n}{1} = a^n x^n$

Exercises 9. $\frac{1}{9}$ **11.** $\frac{1}{25}$ **13.** $\frac{1}{16}$ **15.** −1 **17.** 1 **19.** $0.\overline{4}$ or $\frac{4}{9}$ **21.** $4a$, $b \neq 0$ **23.** $\frac{5}{x^4}$ **25.** $\frac{1}{9n}$ **27.** $\frac{3}{x^2y}$ **29.** $\frac{1}{c^5d^7}$ **31.** $4s^3$ **33.** $\frac{6}{ac^3}$, $d \neq 0$ **35.** $\frac{t^7}{u^{11}}$ **37.** $-\frac{1}{27}$ **39.** −225 **41.** $\frac{4}{5}$ **43.** $\frac{25}{81}$ **45.** 100; there were 100 visitors 4 months before the number of visitors was measured. **47.** negative **49.** negative **51.** 10^{-1} **53.** 10^{-3} **55a.** 5^{-2}, 5^{-1}, 5^0, 5^1, 5^2 **b.** 5^4 **c.** a^n **57.** $4gh^{-3}$ **59.** $\frac{8c^5d^{-4}e^2}{11}$ **61.**

n	3	$\frac{1}{6}$	7	$\frac{5}{8}$	2
n^{-1}	$\frac{1}{3}$	6	$\frac{1}{7}$	$\frac{8}{5}$	0.5

63. Answers may vary. Sample: Let $a = \frac{2}{3}$, then $a^{-1} = \frac{3}{2}$, $a^2 = \frac{4}{9}$, and $a^{-2} = \frac{9}{4}$. **65.** No; answers may