3.6 Problem Solving (pp. 200–202)

37. $\begin{matrix}\text{Bats}\\\text{Balls}\\\text{Uniforms}\end{matrix}\begin{bmatrix}12\\45\\15\end{bmatrix}$, $\text{Cost}\begin{bmatrix}\text{Bat} & \text{Ball} & \text{Uniform}\\21 & 4 & 30\end{bmatrix}$; $\text{Item}\begin{bmatrix}\text{Cost}\\882\end{bmatrix}$

39. Friday: \$1150, Saturday: \$1675

41. *PS*; $\begin{bmatrix}62{,}400 & 57{,}575\end{bmatrix}$, it shows the profit for all of the cars sold by each dealer. **43. a.** $\begin{bmatrix}0.8 & 0.05\\0.2 & 0.95\end{bmatrix}$

b. $M_1 = \begin{bmatrix}4400\\8600\end{bmatrix}$; the number of commuters after 1 year

c. $M_2 = \begin{bmatrix}3950\\9050\end{bmatrix}$, $M_3 = \begin{bmatrix}3612.5\\9387.5\end{bmatrix}$, $M_4 = \begin{bmatrix}3359.375\\9640.625\end{bmatrix}$; the number of commuters after 2, 3, and 4 years

3.7 Skill Practice (pp. 207–208) **1.** determinant **3.** −6 **5.** 25 **7.** 8 **9.** 39 **11.** −206 **13.** −34 **15.** 1160 **17.** −480 **19.** The sum of the products for the diagonals that go up should be subtracted from the sum of the products for the diagonals that go down; 10+ 0 + (−8) − (3 + 24 + 0) = −25 **23.** 12 **25.** 21 **27.** 25 **29.** (−4, 3) **31.** (−7, −5) **33.** (6, −3, −7) **35.** (0, 4, 1) **37.** (8, 6, 7)

3.7 Problem Solving (pp. 208–209) **41.** 12 ft² **43. a.** 60 single scoop, 40 double scoop, 20 triple scoop **b.** \$140.03 **45. a.** 4786 mi² **b.** 3201 mi² **c.** 7987 mi² **d.** Connect Vernal, UT, to Moab, UT.

3.8 Skill Practice (pp. 214–215)

1. matrix of variables $\begin{bmatrix}x\\y\end{bmatrix}$, matrix of constants $\begin{bmatrix}4\\-2\end{bmatrix}$

3. $\begin{bmatrix}-4 & -5\\-1 & -1\end{bmatrix}$ **5.** $\begin{bmatrix}1 & -1\\-\frac{5}{2} & 3\end{bmatrix}$ **7.** $\begin{bmatrix}-\frac{7}{4} & -\frac{3}{2}\\1 & 1\end{bmatrix}$

9. $\begin{bmatrix}-\frac{1}{12} & \frac{1}{6}\\-\frac{1}{60} & \frac{1}{15}\end{bmatrix}$ **11.** The scalar should be $\frac{1}{\det}$; $\frac{1}{6}\begin{bmatrix}5 & -4\\-1 & 2\end{bmatrix} = \begin{bmatrix}\frac{5}{6} & -\frac{2}{3}\\-\frac{1}{6} & \frac{1}{3}\end{bmatrix}$ **13.** $\begin{bmatrix}11 & 9\\-9 & -6\end{bmatrix}$

15. $\begin{bmatrix}-3 & 1\\\frac{11}{2} & -\frac{1}{4}\end{bmatrix}$ **17.** $\begin{bmatrix}18 & 19 & 10\\-3 & -4 & -2\end{bmatrix}$

19. $\begin{bmatrix}-\frac{3}{10} & -\frac{1}{5} & \frac{3}{10}\\\frac{9}{10} & \frac{3}{5} & \frac{1}{10}\\-\frac{1}{5} & \frac{1}{5} & \frac{1}{5}\end{bmatrix}$ **21.** $\begin{bmatrix}-\frac{1}{2} & 0 & \frac{1}{2}\\-\frac{17}{16} & \frac{1}{8} & \frac{7}{16}\\\frac{7}{32} & \frac{1}{16} & -\frac{1}{32}\end{bmatrix}$

23. $\begin{bmatrix}\frac{3}{20} & \frac{3}{10} & \frac{1}{20}\\-\frac{11}{160} & \frac{9}{80} & \frac{3}{160}\\-\frac{1}{40} & -\frac{1}{20} & -\frac{7}{40}\end{bmatrix}$ **25.** (3, 2) **27.** (−1, −4)

29. (10, −2) **31.** (1, −8) **33.** (−3, 5) **35.** (−9, 19, −10) **37.** (−1, −2, 3) **39.** (−2, 10, 0)

41. *Sample answer:* $\begin{bmatrix}2 & 3\\4 & 6\end{bmatrix}$

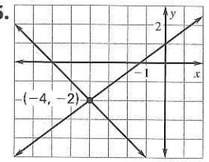
3.8 Problem Solving (pp. 215–217) **43.** single-engine: 150 h, twin-engine: 50 h **45. a.** $2x + y = 8$, $3x + y = 11$ where x represents rolls and y represents muffins

b. $\begin{bmatrix}2 & 1\\3 & 1\end{bmatrix}\begin{bmatrix}x\\y\end{bmatrix} = \begin{bmatrix}8\\11\end{bmatrix}$ **c.** 3 batches of rolls, 2 batches of muffins **47.** Bran Crunchies: 2.3 oz, Toasted Oats: 0.8 oz, Whole Wheat Flakes: 1.2 oz

49. a. $\begin{bmatrix}1 & 4 & 2\\-1 & -3 & -5\end{bmatrix}$, $\begin{bmatrix}-1 & -3 & -5\\-1 & -4 & -2\end{bmatrix}$; 90° clockwise rotation **b.** multiply AAT by A and then again by A

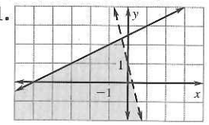
3.8 Problem Solving Workshop (p. 219) **1.** DVD: \$15, popcorn: \$1.75, movie pass: \$8 **3.** 11 lbs of sunflower seed, 9 lbs of thistle seed

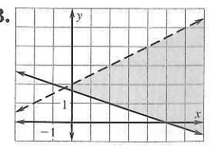
Chapter Review (pp. 222–226) **1.** consistent, inconsistent **3.** The number of columns in the left hand matrix is the same as the number of rows in the right hand matrix.

5. 

(−4, −2)

7. (−3, 7) **9.** (−6, 7)

11. 

13. 

15. (−3, −8, 4) **17.** 10 wind instruments, 3 string instruments, 2 percussion instruments

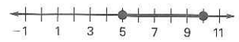
19. $\begin{bmatrix}6 & 4\\8 & -4\end{bmatrix}$ **21.** $\begin{bmatrix}2 & -4 & 0\\7 & 6 & 7\end{bmatrix}$ **23.** $\begin{bmatrix}64 & 32 & 40\\-8 & 48 & -16\end{bmatrix}$

25. $\begin{bmatrix}28 & -76\\-20 & 10\end{bmatrix}$ **27.** $\begin{bmatrix}-2 & 6 & -15\\6 & 0 & -3\end{bmatrix}$ **29.** −42 **31.** 18

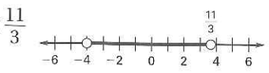
33. (7, 1) **35.** (−1, −4)

Cumulative Review (pp. 232–233) **1.** $-2x^2 + 7x$

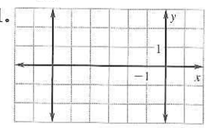
3. $-4x^2 + 6x + 15$ **5.** $-\frac{5}{2}$ **7.** −8, 2 **9.** −16, 25

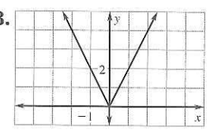
11. $5 \le x \le 10$ 

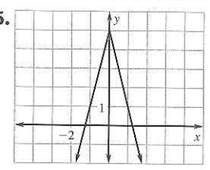
13. $-1 < x < 9$ 

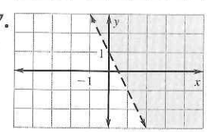
15. $-4 < x < \frac{11}{3}$ 

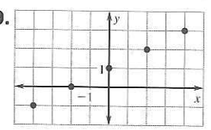
17. $-\frac{7}{12}$; falls **19.** 0; is horizontal

21. 

23. 

25. 

27. 

29. 

function

31. (5, −4) **33.** (−2, 4, 1) **35.** $\begin{bmatrix}6 & 2\\19 & 0\end{bmatrix}$

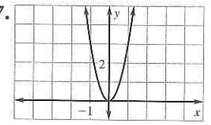
37. $\begin{bmatrix}-15 & 21 & -3\\-30 & 42 & -6\end{bmatrix}$ **39.** $\begin{bmatrix}-\frac{4}{3} & -3\\1 & 2\end{bmatrix}$ **41.** $\begin{bmatrix}-\frac{1}{3} & -\frac{1}{3}\\-\frac{1}{12} & -\frac{5}{24}\end{bmatrix}$

43. a. $W = \frac{TR^2}{R^2 + A^2}$ **b.** About 98 games; it's the same.

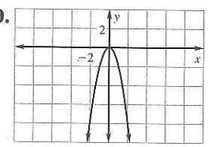
45. $c = \frac{1}{20}p$; \$6250 **47.** $s > 213$, $j \le 263$, $s + j > 472.5$

Chapter 4

4.1 Skill Practice (pp. 240–241) **1.** parabola **3.** 16, 4, 0, 4, 16 **5.** 8, 2, 0, 2, 8

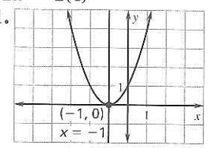
7. 

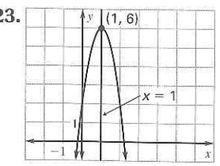
same axis of symmetry and vertex, opens up, and is narrower

9. 

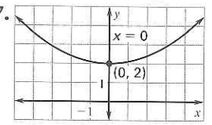
same axis of symmetry and vertex, opens down, and is narrower

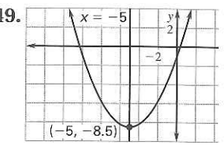
19. The formula for the x-coordinate of the vertex is $-\frac{b}{2a}$; $-\frac{24}{2(4)} = -3$.

21. 

23. 

33. maximum value; −1 **35.** minimum value; −1 **37.** minimum value; −2 **41.** $a = -0.02$, $b = 1$, $c = 6$ **43.** *Sample answer:* $y = -x^2 + 8x + 3$, $y = 2x^2 - 16x - 1$, $y = x^2 - 8x - 6$

47. 

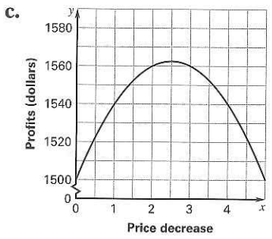
49. 

53. The axis of symmetry has to lie half way between the two x-coordinates; $x = -1$.

4.1 Problem Solving (pp. 242–243) **55.** Raise the price by \$0.75 to increase revenue to \$4900 per day. **57.** about 10 ft **59. a.** profit = price • sales − expenses; $P(x) = (20 - x)(150 + 10x) - 1500$

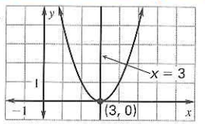
b.

x	$P(x)$
0	1500
1	1540
2	1560
3	1560
4	1540
5	1500

c. 

Reduce the price by \$2.50 to increase profits to \$1562.50 per week.

4.2 Skill Practice (pp. 249–250) **1.** vertex

3. 

5.