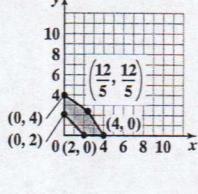


AA102 Answers to Selected Exercises

11. a.

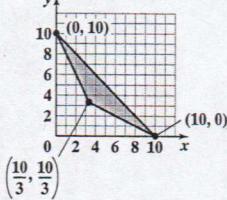


b. $(0, 4): 8; (0, 2): 4; (2, 0): 8; (4, 0): 16;$

$$\left(\frac{12}{5}, \frac{12}{5}\right): \frac{72}{5}$$

c. maximum value: 16 at $x = 4$ and $y = 0$

14. a.



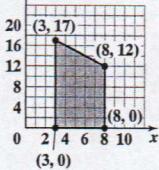
b. $(0, 10): 60; (10, 0): 50; \left(\frac{10}{3}, \frac{10}{3}\right): \frac{110}{3}$

c. maximum value: 60 at $x = 0$ and $y = 10$

16. a. $z = 10x + 7y$

b. $x + y \leq 20; x \geq 3; x \leq 8$

c.



29. does not make sense

30. makes sense

31. makes sense

32. makes sense

33. \$5000 in stocks and \$5000 in bonds

34. $(0, 0): 0; (0, 3): 3B; (3, 1): 3B; (2, 0): \frac{4}{3}B$; maximum value: $3B$ at $(0, 3)$ and $(3, 1)$

37. $\{(6, 3, 5)\}$; Answers may vary.

38. $\{(-2, 1, 4, 3)\}$; Answers may vary.

$$39. \begin{bmatrix} 1 & 2 & -1 \\ 0 & -11 & -11 \end{bmatrix}$$

Chapter 8 Review Exercises

1. $\{(1, 5)\}$

2. $\{(2, 3)\}$

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

4. \emptyset

5. $\{(x, y) | 3x - 6y = 12\}$

6. a. $C(x) = 60,000 + 200x$

b. $R(x) = 450x$

c. $(240, 108,000)$; This means the company will break even if it produces and sells 240 desks.

7. Klimt: \$135 million; Picasso: \$104 million

8. a. Answers will vary; approximately $(2004, 180)$; 2004; 180 million

b. $y = 19.8x + 98$

c. 2004; 180 million

d. Answers will vary from "quite well" to "extremely well."

9. 12 ft by 5 ft

10. \$80 per day for the room, \$60 per day for the car

11. 3 apples and 2 avocados

12. $\{(0, 1, 2)\}$

13. $\{(2, 1, -1)\}$

14. $y = 3x^2 - 4x + 5$

15. 18–29: \$8300; 30–39: \$16,400; 40–49: \$19,500

16. $\frac{3}{5(x-3)} + \frac{2}{5(x+2)}$

17. $\frac{6}{x-4} + \frac{5}{x+3}$

18. $\frac{2}{x} + \frac{3}{x+2} - \frac{1}{x-1}$

19. $\frac{2}{x-2} + \frac{5}{(x-2)^2}$

20. $-\frac{4}{x-1} + \frac{4}{x-2} - \frac{2}{(x-2)^2}$

21. $\frac{6}{5(x-2)} + \frac{-6x+3}{5(x^2+1)}$

22. $\frac{5}{x-3} + \frac{2x-1}{x^2+4}$

23. $\frac{x}{x^2+4} - \frac{4x}{(x^2+4)^2}$

24. $\frac{4x+1}{x^2+x+1} + \frac{2x-2}{(x^2+x+1)^2}$

25. $\{(4, 3), (1, 0)\}$

26. $\{(0, 1), (-3, 4)\}$

27. $\{(1, -1), (-1, 1)\}$

28. $\{(3, \sqrt{6}), (3, -\sqrt{6}), (-3, \sqrt{6}), (-3, -\sqrt{6})\}$

29. $\{(2, 2), (-2, -2)\}$

30. $\{(9, 6), (1, 2)\}$

31. $\{(-3, -1), (1, 3)\}$

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

33. $\left\{\left(\frac{5}{2}, -\frac{7}{2}\right), (0, -1)\right\}$

34. $\{(2, -3), (-2, -3), (3, 2), (-3, 2)\}$

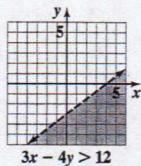
35. $\{(3, 1), (3, -1), (-3, 1), (-3, -1)\}$

36. 8 m and 5 m

37. $(1, 6), (3, 2)$

38. $x = 46$ and $y = 28$ or $x = 50$ and $y = 20$

39.



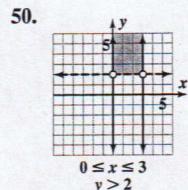
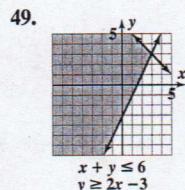
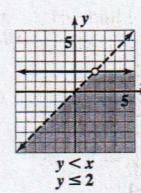
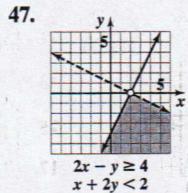
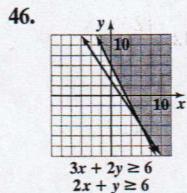
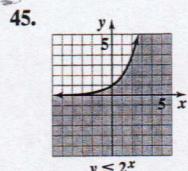
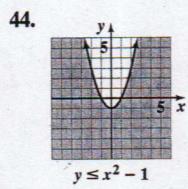
40. $3x - 4y > 12$

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

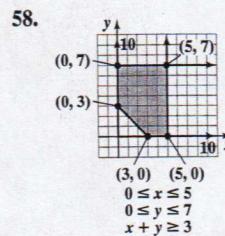
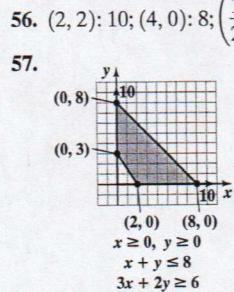
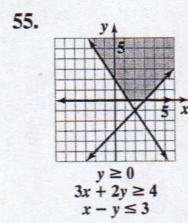
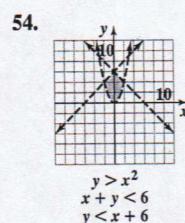
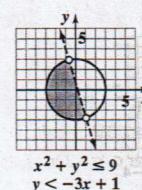
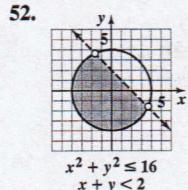
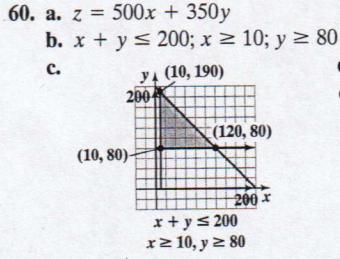
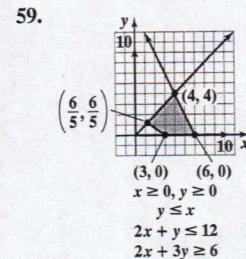
42. $x < -2$

43. $y \geq 3$

44. $x^2 + y^2 > 4$



51. no solution

Maximum is 24 at $x = 0, y = 8$. Maximum is 33 at $x = 5, y = 7$.Maximum is 44 at $x = y = 4$.

61. 480 of model A and 240 of model B

Chapter 8 Test

1. $\{(1, -3)\}$

2. $\{(4, -2)\}$

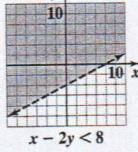
3. $\{(1, 3, 2)\}$

4. $\{(4, -3), (-3, 4)\}$

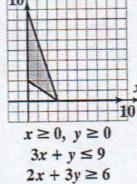
5. $\{(3, 2), (3, -2), (-3, 2), (-3, -2)\}$

6. $\frac{-1}{10(x+1)} + \frac{x+9}{10(x^2+9)}$

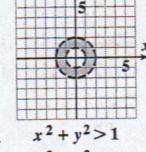
7.



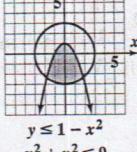
8.



9.



10.

11. 26 12. shrimp: 42 mg; scallops: 15 mg 13. a. $C(x) = 360,000 + 850x$ b. $R(x) = 1150x$ c. (1200, 1,380,000); The companywill break even if it produces and sells 1200 computers. 14. $y = x^2 - 3$ 15. $x = 7.5$ ft and $y = 24$ ft or $x = 12$ ft and $y = 15$ ft

16. 50 regular and 100 deluxe jet skis; \$35,000

Cumulative Review Exercises (Chapters 1–8)1. domain: $(-2, 2)$; range: $(-\infty, 3]$ 2. -1 and 1 3. maximum of 3 at $x = 0$ 4. $(0, 2)$ 5. positive 6. 3 7. $x \rightarrow -2^+$; $x \rightarrow 2^-$ 8. even