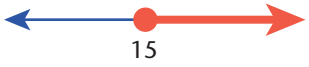
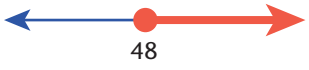
Review Answers

CHAPTER 1 REVIEW ANSWER KEY

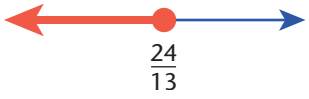
1. $x = -5$
2. $x = \frac{62}{11}$
3. $x = -2^3$
4. $x = 0$
5. $x = \frac{7}{8}$
6. $x = \frac{-47}{3}$
7. $x = \frac{14}{13}$
8. N.S.
9. 10
10. \$1722.60
11. 22, 24 and 26
12. $x \geq 15$



13. $x \geq 48$



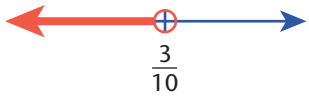
14. $x \leq \frac{24}{13}$



15. $-2 \leq x < 1$

16. $w > -11$

17. $x < \frac{3}{10}$



18. 71
19. \$5,000
20. $\frac{-1}{3}$
21. 0
22. undefined slope
23. $y = 3x + 11$
24. $y = -2x + 5$
25. $y = -\frac{1}{2}x + 2$
26. $y = -5x + 9$
27. $x = 10$
28. \$53.75
29. (1, 1)
30. (–3, 0)
31. (2, 9)
32. N.S.
33. same line; infinitely many solutions
34. N.S.
35. $\left(\frac{1}{2}, -\frac{1}{3}\right)$
36. same line; infinitely many solutions
37. (5, 3, 0)
38. (–1, 7, –3)
39. 35 hats, 65 party favors
40. not a function
41. is a function; domain: $x \in \mathbb{R}$, $x \neq 5, -\frac{1}{2}$
42. is a function; domain: $x \in \mathbb{R}$, $x \geq -5$
43. is a function; domain: $x \in \mathbb{R}$, $x > 4$

44. **a.** 7
b. $2h^2 - 4h + 1$

45. **a.** $\frac{9}{\sqrt{2}}$ or $\frac{9\sqrt{2}}{2}$
b. $\frac{9}{\sqrt{3w+5}}$

46. **a.** $-\frac{9}{4}$
b. $\frac{2x^2+1}{x^2-8}$

47. **a.** $\sqrt{3}$
b. $\sqrt{2-y-h}+\sqrt{y+h+1}$

48. **a.** $\sqrt{5}$
b. $\sqrt{x^4+2x^2-3}$

49. (150, \$21)

50. \$190; 360 chairs

51. (a) 201 shirts; (b) \$2;
(c) (210, \$18)

52. $p = -\frac{-1}{800}q + 2$; \$0.75 each

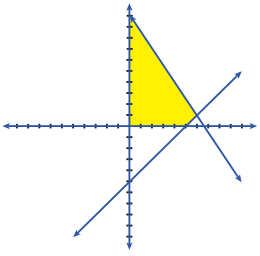
53. 400 books; \$18,000; \$18,000

54. 77 jars; \$237.50; \$725

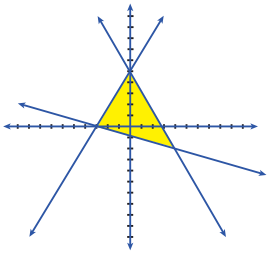
55. 10 students; \$1,110

56. (a) $P = 3.5x - 310$;
(b) (88.6, \$575.70)

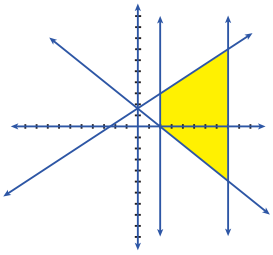
57.



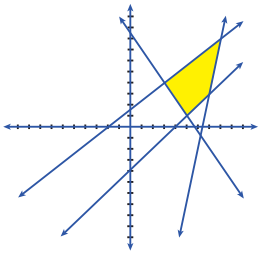
58.



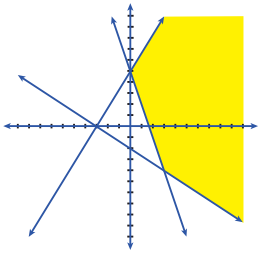
59.



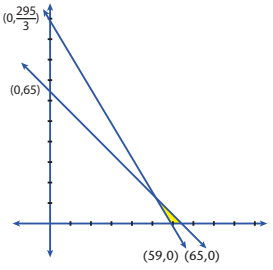
60.



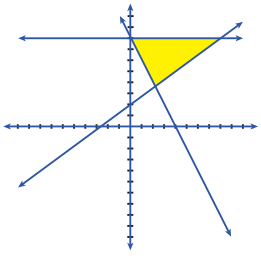
61.



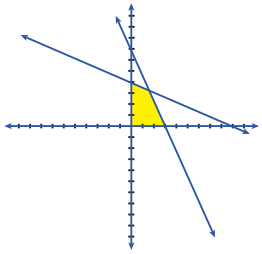
62. $x \geq 0,\ y \geq 0$
$x + y \leq 65$
$10x + 6y \geq 590$



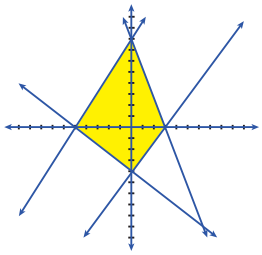
63. maximum of 40 at (0, 8)
minimum of 11 at (2, 3)



64. maximum of 9 at (3, 0)
minimum of 0 at (0, 0)



65. maximum of 15 at (3, 0)
minimum of –25 at (–5, 0)



66. $325; 65 adults and
0 students

CHAPTER 2 REVIEW ANSWER KEY

1. $\begin{bmatrix} -36 & 36 \\ 20 & -36 \\ 12 & 16 \end{bmatrix}$

2. a. $\begin{bmatrix} 0 & 15 & 16 \\ 4 & 0 & 13 \end{bmatrix}$ **b.** $\begin{bmatrix} 15 & -15 & -8 \\ -2 & 30 & -19 \end{bmatrix}$

3. a. $\begin{bmatrix} 9 & 7 \\ 9 & 8 \end{bmatrix}$ **b.** $\begin{bmatrix} 0 & 6 \\ 14 & 16 \end{bmatrix}$ **c.** $\begin{bmatrix} 22 & 9 \\ 13 & 5 \end{bmatrix}$

4. $\begin{bmatrix} 12 & 2 & 0 \\ 8 & 6 & 3 \\ -3 & -9 & 1 \end{bmatrix}$

5. $x = -4$, $y = -1$, $z = -2$, $w = 2$

6. a. impossible
b. 3×2
c. 2×3
d. impossible
e. impossible
f. 3×2
g. 2×3
h. impossible

7. a. $\begin{bmatrix} 95 & 34 \\ 75 & 56 \end{bmatrix}$ **b.** $\begin{bmatrix} 95 & 75 \\ 34 & 56 \end{bmatrix}$

8. a. $\begin{bmatrix} 25 & 15 \\ -5 & 25 \end{bmatrix}$ **b.** $\begin{bmatrix} 20 & 10 \\ -10 & 30 \end{bmatrix}$ **c.** $\begin{bmatrix} 20 & -10 \\ 10 & 30 \end{bmatrix}$

9. a. $\begin{bmatrix} 1 & 8 & 47 \\ 0 & 1 & 15 \\ 0 & 0 & 4 \end{bmatrix}$ **b.** $\begin{bmatrix} 1 & 12 & 143 \\ 0 & 1 & 35 \\ 0 & 0 & 8 \end{bmatrix}$

10. a. $\begin{bmatrix} -24 \\ -14 \\ 5 \end{bmatrix}$
b. impossible
c. $[2 \ 3 \ -7]$
d. $\begin{bmatrix} 2 \\ 3 \\ -7 \end{bmatrix}$

11. (–4, 2, –4)
12. N.S.
13. $(1 + 5a, 1 + a, a)$
14. (1, 3, –4)
15. (5, 0,–2)
16. $(a, 3a + 1, 5 - 4a)$

17. $A^{-1} = \begin{bmatrix} \frac{3}{5} & \frac{2}{5} \\ -\frac{1}{5} & \frac{1}{5} \end{bmatrix}$

18. $A^{-1} = \begin{bmatrix} \frac{1}{4} & \frac{1}{2} & -\frac{1}{4} \\ -\frac{1}{12} & -\frac{1}{2} & \frac{3}{4} \\ -\frac{1}{12} & \frac{1}{2} & -\frac{1}{4} \end{bmatrix}$ or $\frac{1}{12}\begin{bmatrix} 3 & 6 & -3 \\ -1 & -6 & 9 \\ -1 & 6 & -3 \end{bmatrix}$

19. $A^{-1} = \begin{bmatrix} 0 & -1 \\ \frac{1}{4} & \frac{5}{4} \end{bmatrix}$

20. not possible; A is not a square matrix
21. DNE
22. DNE

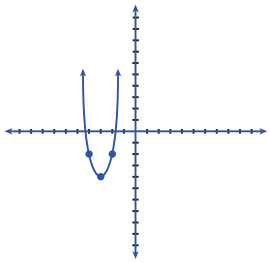
23. $A^{-1} = \begin{bmatrix} \frac{5}{18} & \frac{1}{9} & -\frac{1}{18} \\ \frac{1}{6} & -\frac{1}{3} & \frac{1}{6} \\ -\frac{2}{9} & \frac{1}{9} & \frac{4}{9} \end{bmatrix}$ or $\frac{1}{18}\begin{bmatrix} 5 & 2 & -1 \\ 3 & -6 & 3 \\ -4 & 2 & 8 \end{bmatrix}$

24. $X = \begin{bmatrix} -18 \\ 11 \\ 12 \end{bmatrix}$

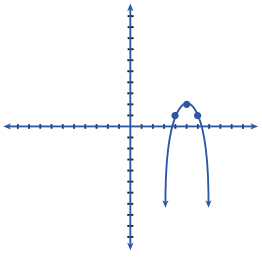
25. 71 –167 77 35 –86 42 37 –112 69 –7 –14 35
26. DINNER IS READY
27. 3 of Portfolio 1, 2 of Portfolio 2 and 1 of Portfolio 3
28. 29 mg food 1, 49 mg food 2, 22 mg food 3
29. 14 oz. peanuts, 5 oz. cashews, 5 oz. almonds
30. $18,000 from her sister, $26,000 from her brother, and $36,000 from her parents

CHAPTER 3 REVIEW ANSWER KEY

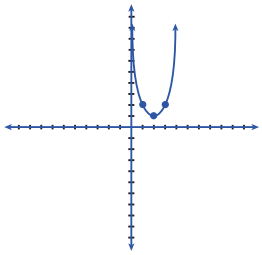
1. $x = \frac{\pm 5}{2}$
2. $x = -4, \frac{3}{2}$
3. $x = -2 \pm \sqrt{11}$
4. $x = -\frac{1}{3}, \frac{5}{2}$
5. $w = -1, 3$
6. $x = 3, -8$
7. $x = 11, -3$
8. $y = -6, 7$
9. **a.** $(-3, -4)$
   b. $x = -3$
   c. up
   d. minimum
   e. $(-3 + \sqrt{2}, 0)$ and $(-3 - \sqrt{2}, 0)$
   f.



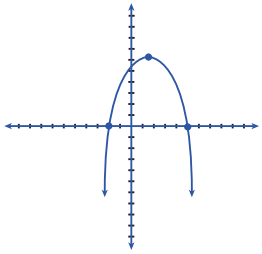
10. **a.** $(5, 2)$
    b. $x = 5$
    c. down
    d. maximum
    e. $(5 + \sqrt{2}, 0)$ and $(5 - \sqrt{2}, 0)$
    f.



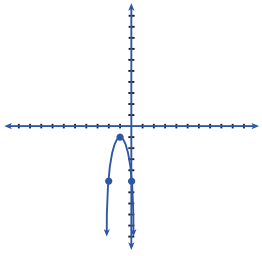
11. **a.** $(2, 1)$
    b. $x = 2$
    c. up
    d. minimum
    e. none
    f.



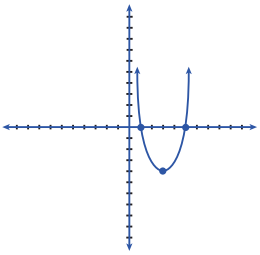
12. **a.** $\left(\frac{3}{2}, \frac{49}{8}\right)$
    b. $x = \frac{3}{2}$
    c. down
    d. maximum
    e. $(-2, 0)$ and $(5, 0)$
    f.



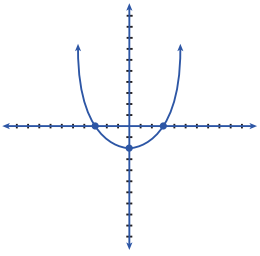
13. **a.** $(-1, -1)$
    b. $x = -1$
    c. down
    d. maximum
    e. none
    f.



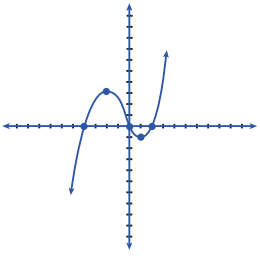
14. **a.** (3, –4)
b. $x = 3$
c. up
d. minimum
e. (1, 0) and (5, 0)
f.



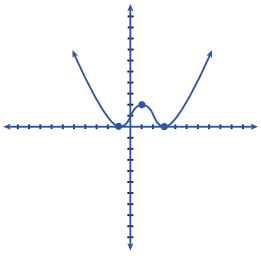
15. **a.** (0, –2)
b. $x = 0$
c. up
d. minimum
e. (3, 0) and (–3, 0)
f.



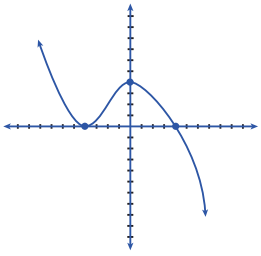
16. 92256 square feet
17. 580 boxes, $671,800
18. ~231 or 1000 units
19. 20 or 31 units
20. 14 or 28 units
21. (4, $68)
22. (7, $294)
23. (177, $39)
24. (10, $24)
25. 20; $8
26. **a.** 3
b. $x = 0, 2, -4$
c. (0, 0)
d. (0, 0), (2, 0) and (–4, 0)
e.



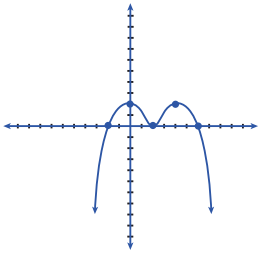
27. **a.** 4
b. $x = -1, 3$
c. $\left(0, \frac{9}{8}\right)$
d. (–1, 0) and (3, 0)
e.



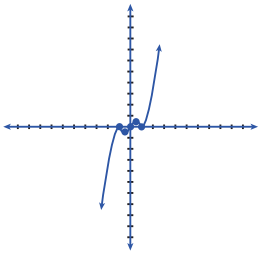
28. **a.** 3
b. $x = -4, 4$
c. (0, 4)
d. (4, 0) and (–4, 0)
e.



29. **a.** 4
b. $x = 2, -2, 6$
c. (0, 2)
d. (–2, 0), (2, 0) and (6, 0)
e.



30. **a.** 5
b. $x = 0, 1, -1$
c. (0, 0)
d. (0, 0), (1, 0) and (–1, 0)
e.



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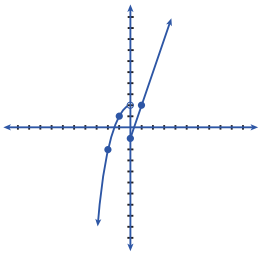
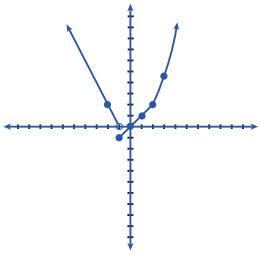


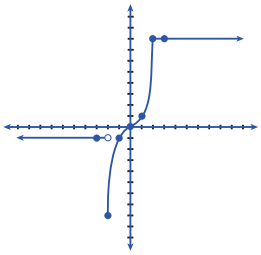
x	–2	–1	0	1	2	3
y	–2	1	–1	2	5	8

32.



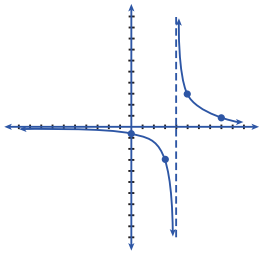
x	–2	–1	0	1	2	3
y	2	–1	0	1	2	4.5

33.

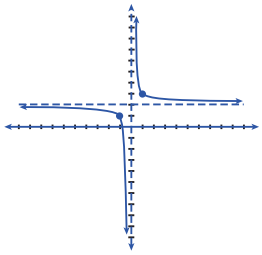


x	–3	–2	0	1	2	3
y	–1	–8	0	1	8	8

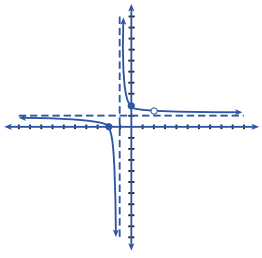
34. **a.** $x \in \mathbb{R}, x \neq 4$
b. $x = 4$
c. $y = 0$
d. (0, –0.75)
e. none
f.



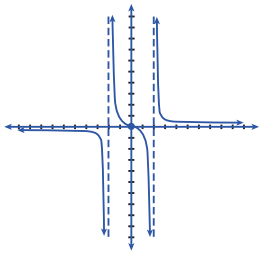
35. **a.** $x \in \mathbb{R}, x \neq 0$
b. $x = 0$
c. $y = 2$
d. none
e. (–0.5, 0)
f.



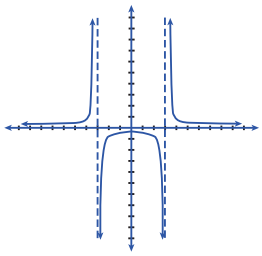
36. **a.** $x \in \mathbb{R}, x \neq 2, -1$
b. $x = -1$
c. $y = 1$
d. (0, 2)
e. (–2, 0)
f.



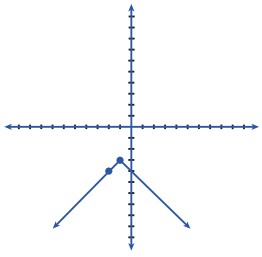
37. **a.** $x \in \mathbb{R}$, $x \neq \pm 2$
b. $x = 2$, $x = -2$
c. $y = 0$
d. (0, 0)
e. (0, 0)
f.



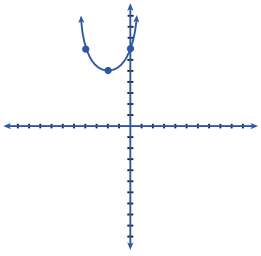
38. **a.** $x \in \mathbb{R}$, $x \neq \pm 3$
b. $x = 3$, $x = -3$
c. $y = 0$
d. $\left(0, -\frac{4}{9}\right)$
e. none
f.



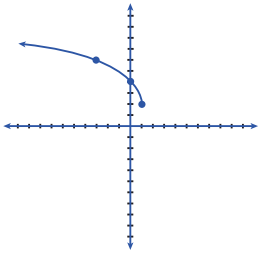
39. **a.** down 3
b. left 1
c. no
d. no
e. yes; vertical
f.



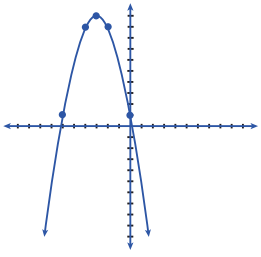
40. **a.** up 5
b. left 2
c. yes; shrunk by half
d. no
e. no
f.



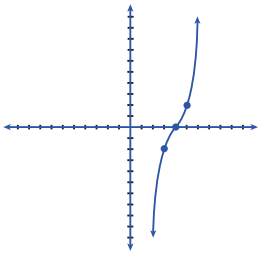
41. **a.** up 2
b. right 1
c. no
d. yes; shrunk 4
e. yes; horizontal
f.



42. **a.** up 10
b. left 3
c. no
d. no
e. yes; vertical
f.



43. **a.** none
b. right 4
c. yes; stretched 2
d. no
e. no
f.



44. **a.** $\sqrt{2x+1} - x + 5$
b. $4\sqrt{3}$
c. $\sqrt{-2x+11}$
d. $5 - \sqrt{2x+1}$
e. $3 - \sqrt{5}$
f. $\dfrac{\sqrt{7}}{2}$
g. $\sqrt{2\sqrt{2x+1}+1}$

45. **a.** $x^2 + |x| + 2$
b. 0
c. $x^2 - 2|x| + 4$
d. $|x^2 + 3| - 1$ or $x^2 + 2$
e. –6
f. 6
g. $x^4 + 6x^2 + 12$

46. **a.** $x^3 + x + \dfrac{2}{x+1}$
b. 2
c. $\dfrac{2(x^2+2x+5)}{(x+1)^3}$
d. $\dfrac{2}{x^3+x+1}$
e. $-\dfrac{28}{3}$
f. 60
g. $x^9 + 3x^7 + 3x^5 + 2x^3 + x$

47. **a.** $x^2 + \dfrac{x+5}{x-3}$
b. –3
c. $\dfrac{x^2+5}{x^2-3}$
d. $\dfrac{(x+5)^2}{(x-3)^2}$
e. 11
f. DNE
g. $\dfrac{5-3x}{x-7}$

48. **a.** $2x - 6 + \dfrac{x}{x^2-25}$
b. $\dfrac{1}{6}$
c. $\dfrac{2x}{x^2-25} - 6$
d. $\dfrac{2x-6}{4x^2-24x+11}$
e. $\dfrac{40}{21}$
f. 0
g. $4x - 18$

49. **a.** $x^3 + \sqrt{x} - 1$
b. 0
c. $\sqrt{x^3-1}$
d. $x\sqrt{x} - 1$
e. $7 - \sqrt{2}$
f. $\dfrac{\sqrt{3}}{26}$
g. $\sqrt[4]{x}$

50. **a.** $x^2 - x$
b. –16
c. $-4x^2 - 12x$
d. $16x^2 - 12x$
e. 18
f. $-\dfrac{2}{3}$
g. $16x$

CHAPTER 4 REVIEW ANSWER KEY

1. $f^{-1}(x) = \sqrt[3]{\frac{x+4}{2}} - 3$

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

3. $f^{-1}(w) = \frac{9w}{3 - 4w}$

4. $p^{-1}(y) = \frac{216}{(y-2)^3}$

5. $g^{-1}(x) = \sqrt[3]{\frac{5x-1}{x+1}}$

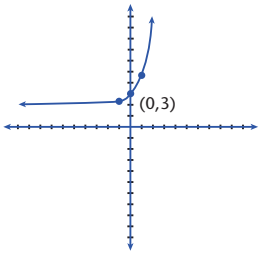
6. $y^{-1}(x) = \frac{7 + 11x^3}{2x^3 - 1}$

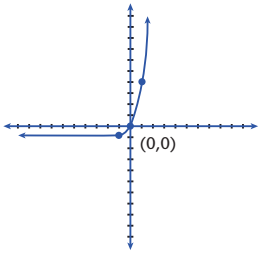
7. $f^{-1}(p) = -1 - \frac{2}{p}$

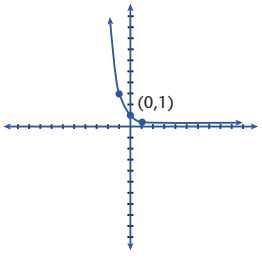
8. **a.** domain: $x \geq 1$; $f^{-1}(x) = \sqrt{\frac{x-3}{5}} + 1$

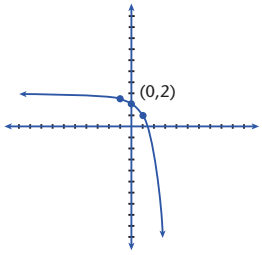
   b. domain: $x \geq -1$; $y^{-1}(x) = 2(x+1)^2$

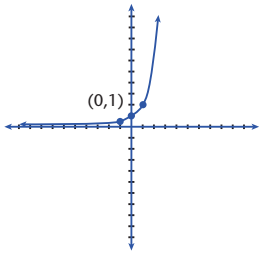
   c. domain: $x \geq 0$; $h^{-1}(x) = \sqrt[4]{\frac{7-x}{2}}$

9. 

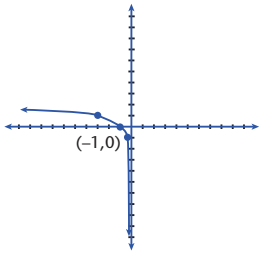
10. 

11. 

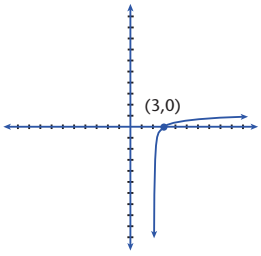
12. 

13. 

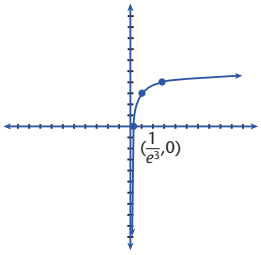
14. $3^{12x - 3x^2}$
15. 4^{2x-2}
16. π^{5x+1}
17. $(-36)^x e^x$
18. $\left(\frac{\pi}{e}\right)^{2x-3y}$
19. $5^2 = 25$
20. $4^{-1} = \frac{1}{4}$
21. $10^0 = 1$
22. $e^{-\frac{1}{2}} = \frac{1}{\sqrt{e}}$
23. 0
24. 4
25. –5
26. –4
27. domain: $x < 0$



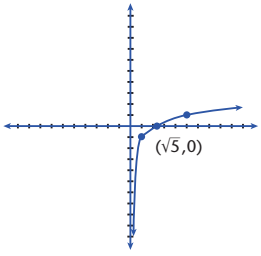
28. domain: $x > 2$



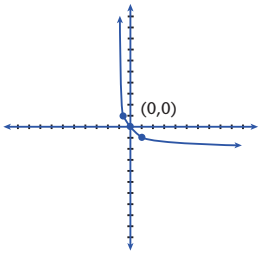
29. domain: $x > 0$



30. domain: $x > 0$



31. domain: $x > -1$



32. $4\log(x^2 + 5) - 12\log x$

33. $2\ln x + \frac{4}{3}\ln(x-1) - \frac{1}{3}\ln(x+9)$

34. $2\log_5(x+1) + 3\log_5(x-2) + 4\log_5(x+3) - \log_5 x$

35. $\log_2\left(\frac{9x^3}{(x+5)^4}\right)$

36. $\log_4\left(\frac{\sqrt{x-3}}{\sqrt[4]{x}}\right)$

37. $\ln\left(\frac{e^{3x}(5x-2)}{x^2}\right)$

38. $\log(20)$

39. $\log_5(2x^2(x^2-5))$

40. 7.5

41. 0

42. $\pi - 1$

43. $x = \frac{\ln 6}{5}$

44. $x = 2, -5$

45. $x = 0$

46. $w = -3$

47. $x = \ln\left(\frac{5}{2}\right)$

48. $x = 5$

49. $x = 2 \pm 2\sqrt{6}$

50. $x = 6$

51. $x = 9, -10$

52. $x = \frac{e^3 - 2}{1 - e^3} \approx -0.9476$

53. $x = \frac{1}{62}$

54. $x = 0, 2$

55. **a.** 40
b. ~252
c. 400

56. **a.** 4
b. ~13 days

57. **a.** \$149.62
b. ~5 units

58. 68.9%

59. ~4 years

60. ~64 years

61. **a.** $P = 14000e^{0.03t}$
b. ~14866
c. 2031

62. **a.** \$6077.53
b. ~5.44 years

CHAPTER 5 REVIEW ANSWER KEY

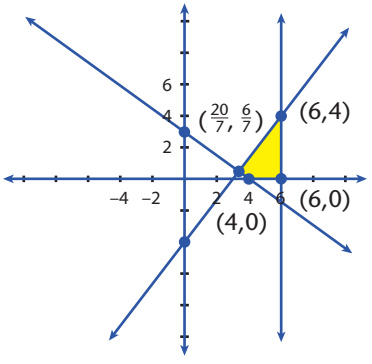
1. **a.** $a_n = 3n - 7$; –4, –3, 0
b. $a_n = -4(3^{n-1})$; –4, 12, 36

2. **a.** $a_n = \frac{5}{2}n - 2$; $\frac{1}{2}$, 3, $\frac{11}{2}$

b. $a_n = \frac{1}{2}\left(\frac{5}{2}\right)^{n-1}$; $\frac{1}{2}, \frac{5}{4}, \frac{25}{8}$

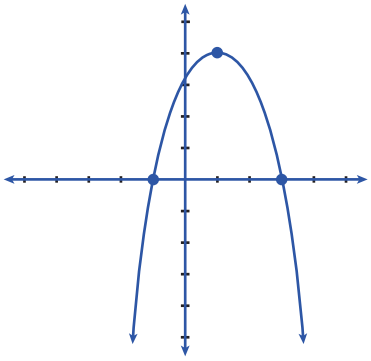
3. **a.** $a_n = -2n + 27$; 25, 23, 21
   b. $a_n = 25(-2)^{n-1}$; 25, –50, 100
4. **a.** $a_n = 6n - 5$; 1, 7, 13
   b. $a_n = 6^{n-1}$; 1, 6, 36
5. **a.** 19.5
   b. 3×10^{-11}
6. **a.** –13.4
   b. –9,765, 625
7. **a.** 38
   b. $\frac{-3}{1024}$
8. 12,720
9. –17,280
10. 8,680
11. 11,184,810
12. $\frac{-4095}{512}$ or –7.998046875
13. 1559.098778
14. ~5.68 years; ~4.65 years
15. $8,588.43
16. $29,017.96
17. $[illegible]1.57
18. 8.16%; 8.3%
19. $16,174.52
20. $68,654.73
21. $1,974.60
22. $2,691.65
23. $352.97
24. ~17.12 years
25. $936.68
26. $112,940.87
27. $6,013.67
28. $41,257.58
29. $2,506.91
30. $1,084.34
31. **a.** $429.84
    b. $25,790.14
    c. $4,790.14
32. $284,839.65
33. $222,753.81
34. $1,202.36; $151,754.41

FINAL REVIEW ANSWER KEY

1. $A^{-1} = \begin{bmatrix} 1 & \frac{2}{5} \\ 0 & \frac{1}{5} \end{bmatrix}$
2. **a.** $\begin{bmatrix} 2 & 3 & 6 \\ 3 & 4 & 1 \\ 6 & 1 & 6 \end{bmatrix}$
   b. $\begin{bmatrix} 29 & 25 \\ 10 & 12 \end{bmatrix}$
3. (–52, –28, –6)
4. **a.** 295
   b. 14,650
5. $6,069.44
6. $245,049.99
7. **a.** $f(x)$ domain: $x \le 1$; $g(x)$ domain: $x \in \mathbb{R}$
   b. $g(f(x)) = 2 - x$; domain $x \in \mathbb{R}$
   c. $\left(\frac{f}{g}\right)(x) = \frac{\sqrt{1-x}}{x^2+1}$
8. N.S.
9. $y = \frac{2}{3}x + \frac{5}{3}$
10. $y > \frac{-2}{3}x$
11. 

12. Max $P = 20$ at (10,0)
13. **a.** $P(x) = -x^2 + 19x - 84$
    b. (7, 0) and (12, 0)
14. width = 25 ft, length = 25 ft
15. **a.** (3, 0) and (–1, 0)
    b. (1, 4)

c.



16. a. 3200 people

b. $t = \dfrac{\ln 2}{0.025} \approx 27.7$ years

c. 3281 people

17. $2^x = 32$; $x = 5$

18. $x = 4, 2.5$

19. 330 units

20. about 720 feet

21. a. $x \in \mathbb{R}$, $x \neq -5$, $-\dfrac{5}{3}$

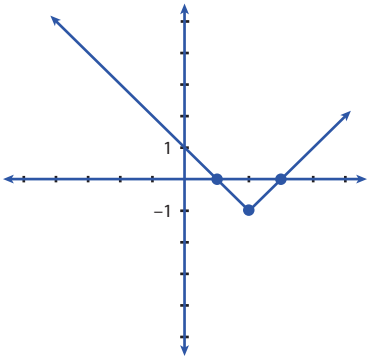
b. $x \in \mathbb{R}$

c. 0

d. $\dfrac{1}{25}$

e. $\dfrac{1}{3}$

22. y-intercept: (0, 1), x-intercepts: (1, 0) and (3, 0)



23. $p = -\dfrac{1}{20}q + 200$

24. $x = 5.5$

25. a. $x = -3$

b. $x = \ln 3$

c. $x = \dfrac{100}{3}$

26. \$12,126.00

27. \$701.90

28. a. $\begin{bmatrix} 3 & 0 & -4 \\ 3 & 2 & -1 \end{bmatrix}$

b. not possible; number of columns of B doesn't equal number of rows of A

c. $\begin{bmatrix} -1 & -1 & 1 \\ 2 & 2 & -1 \\ -1 & -2 & 1 \end{bmatrix}$

29. solution exists; (1, 2, 3)

30. max of 16 at (4, 0)

31. a. $x > 6$ or $x < -\dfrac{22}{3}$

b. $x = \dfrac{1}{5}$ or -11

32. 500 bicycles

33. $x = 1, 3$

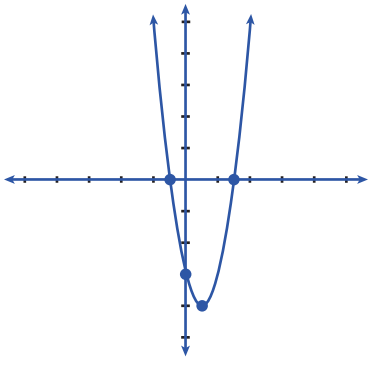
34. a. $x \in \mathbb{R}$, $x \neq -1, 1$

b. $4x^2 - 4x$

c. $\frac{1}{2}(x - 1)$

d. $x^2 - 2x$

35. x-intercepts: (3, 0) and (–1, 0); y-intercept: (0, –6); vertex: (1, –8)



36. 18 lbs of 7% nitrogen fertilizer and 9 lbs of 13% nitrogen fertilizer

37. a. $x = 5$

b. $x = -8$

c. $x = 10$

38. about 6.8 years

39. \$1,169.12

40. \$[illegible]1.69

41. a. $\begin{bmatrix} 9 & 3 & 13 & 5 \\ 6 & -4 & 6 & 6 \\ 3 & 8 & 8 & -2 \end{bmatrix}$

b. not possible; number of columns of B is not equal to number of rows of A

c. $\begin{bmatrix} -4 & 9 & -8 & -2 \\ -1 & -3 & 7 & 0 \end{bmatrix}$

42. **a.** $\begin{bmatrix} 2 & -5 \\ -1 & 3 \end{bmatrix}\begin{bmatrix} x \\ y \end{bmatrix} = \begin{bmatrix} 2 \\ 1 \end{bmatrix}$

b. $\begin{bmatrix} 3 & 5 \\ 1 & 2 \end{bmatrix}$

c. (11, 4)

43. max at (0, 12) with $P = 24$

44. N.S.

45. $y = -\frac{1}{2}x + \frac{5}{2}$

46. **a.** –16

b. $-2x^2 + 19x - 41$

47. $f^{-1}(x) = \sqrt[3]{(x-1)^5 + 5}$

48. **a.** $x \geq 0$

b. x-intercepts: (–10, 0) and (30, 0); y-intercept: (0, 150)

c. \$200

49. $q = 20$, $p = \$10$

50. 2

51. **a.** $x \approx 4.4794$

b. $x = 50$

52. in about 35 months

53. \$19,825.88

54. \$294.07

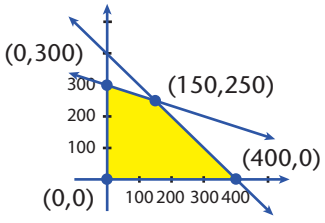
55. **a.** $\begin{bmatrix} 1 & -7 & 15 \\ 7 & -2 & 17 \\ 12 & 1 & 7 \end{bmatrix}$

b. not possible; number of columns of A not equal to number of rows of B

c. $\begin{bmatrix} 6 & 8 & 20 \\ 5 & 4 & 9 \end{bmatrix}$

56. (2, –1, 3)

57. **a.** x = number of tables, y = number of chairs;
$x \geq 0$, $y \geq 0$
$2x + 6y \leq 1800$
$x + y \leq 400$



b. 400 tables and 0 chairs

58. **a.** $y = -2x - 3$

b. $y = -\frac{1}{2}x + 4$

59. **a.** $x = \frac{-5 \pm \sqrt{13}}{6}$

b. $x = 4, 9$

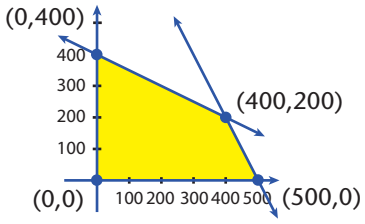
60. $q = 11$, $p = \$19$

61. **a.** $0.05x + 0.1y = 200$ and $x + y = 2500$

b. $\begin{bmatrix} 0.05 & 0.1 \\ 1 & 1 \end{bmatrix}\begin{bmatrix} x \\ y \end{bmatrix} = \begin{bmatrix} 200 \\ 2500 \end{bmatrix}$

c. $x = \$1000$, $y = \$1500$

62. **a.** x = # dark chocolate truffles,
y = # light chocolate truffles
$x \geq 0$, $y \geq 0$
$2x + 4y \leq 1600$
$10x + 5y \leq 5000$

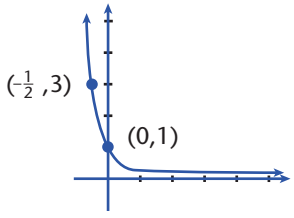


b. 400 dark chocolate truffles and 200 light chocolate truffles for \$560 revenue

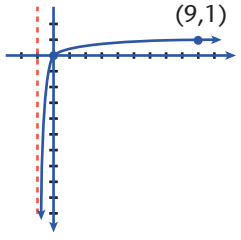
63. **a.** $x = 6$

b. $x = 0, -1$

64. **a.** HA: $y = 0$



b. VA: $x = -1$



65. \$1,053.35; \$50,560.96

66. **a.** \$54,736.73

b. \$58,576.09

67. **a.** \$2 and \$3; 2000 units and 1000 units

b. max profit is \$250 for 1500 units at a price of \$2.50 per unit

68. **a.** not possible; number of columns of A is not equal to number of rows of B

b. $\begin{bmatrix} \frac{1}{4} & 0 \\ -\frac{3}{8} & -\frac{1}{2} \end{bmatrix}$

c. $\begin{bmatrix} 8 & 4 & 12 \\ -6 & -13 & -7 \end{bmatrix}$

d. $\begin{bmatrix} -1 & 1 & 10 \\ 0 & 9 & -7 \end{bmatrix}$

69. **a.** $x = 5$

b. $x = 2$

70. **a.** \$814.42

b. \$293,192.88

c. \$143,192.88

71. **a.** \$827.79

b. after 35 quarters (or 8.75 years)