

SUMMER PACKET

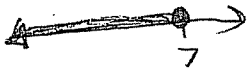
SOLUTIONS

for

PRE-CALCULUS

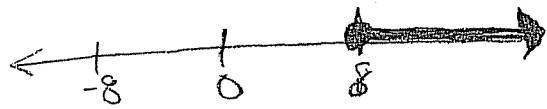
$$\textcircled{1} \quad y - 5 \leq 2$$

$$y \leq 7$$

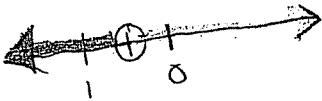


$$\textcircled{7} \quad 32 \leq 4p$$

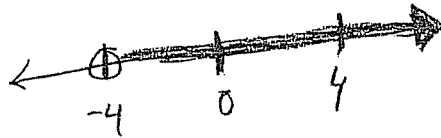
$$8 \leq p$$



$$\textcircled{2} \quad t < -\frac{1}{2}$$

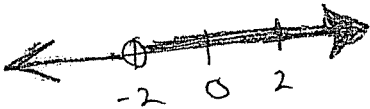


$$\textcircled{8} \quad -4 < r$$



$$\textcircled{3} \quad -4m < 8$$

$$m > -2$$



$$\textcircled{4} \quad 7d \leq 2d + 10$$

$$5d \leq 10$$

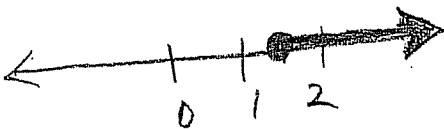
$$d \leq 2$$



$$\textcircled{5} \quad -6 + 2h + 2h \geq 0$$

$$4h \geq 6$$

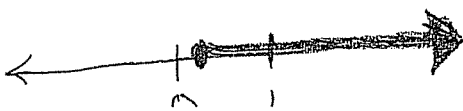
$$h \geq \frac{3}{2}$$



$$\textcircled{6} \quad 5k - 1 > 1$$

$$5k > 2$$

$$k > \frac{2}{5}$$

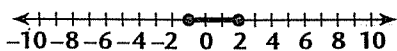


Lesson 1-4

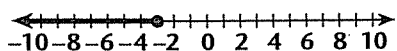
Lesson 1.7

ANSWERS

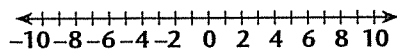
* 10. $x \geq -1$ and $x \leq 2$



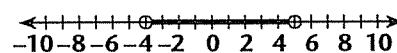
11. $x \leq -2$ and $x \leq -3$



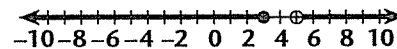
* 12. no solution



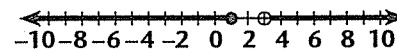
13. $x > -4$ and $x < 5$



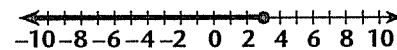
* 14. $z \leq 3$ or $z > 5$



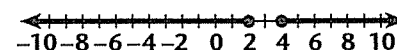
15. $y \leq 1$ or $y > 3$



* 16. $x \leq 3$

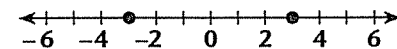


17. $a \leq 2$ or $a \geq 4$

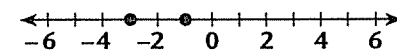


Lesson 1.8

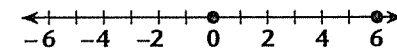
* 1. $x = 3$ or $x = -3$



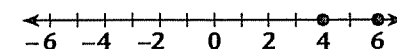
2. $a = -3$ or $a = -1$



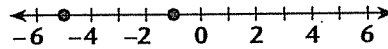
* 3. $b = 0$ or $b = 6$



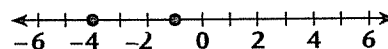
4. $x = 4$ or $x = 6$



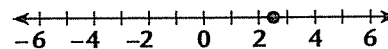
* 5. $y = -5$ or $y = -1$



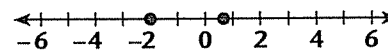
6. $t = -4$ or $t = -1$



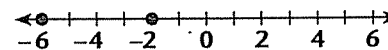
* 7. $a = 2.5$



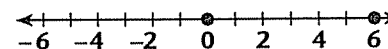
8. $x = -2$ or $x = \frac{2}{3}$



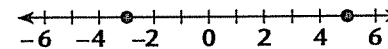
* 9. $t = -6$ or $t = -2$



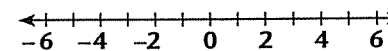
10. $x = 0$ or $x = 6$



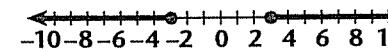
* 11. $m = -3$ or $m = 5$



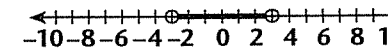
12. no solution



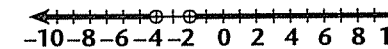
* 13. $x \leq -3$ or $x \geq 3$



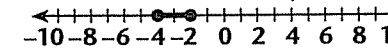
* 14. $x > -3$ and $x < 3$



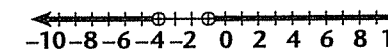
* 15. $a < -4$ or $a > -2$



* 16. $a \geq -4$ and $a \leq -2$



17. $b < -4$ or $b > -1$



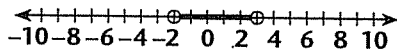
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ANSWERS

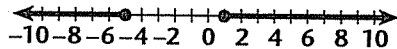
18. $x \geq -2$ and $x \leq 6$



19. $c > -2$ and $c < 3$



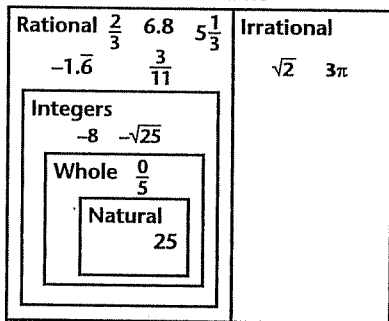
20. $y \leq -5$ or $y \geq 1$



Reteaching — Chapter 2

Lesson 2.1

1-10. Real Numbers



11. True; Associative Property of Multiplication

12. True; Inverse Property of Addition

13. False 14. False

15. True; Commutative Property of Multiplication

16. True; Identity for Multiplication

17. True; Distributive Property

18. True; Commutative Property of Addition

19. 38 20. 2 21. 9 22. 2 23. 10

24. 1 25. 65 26. 0 27. 0

Lesson 2.2

1. 25 2. 32 3. 6 4. 1 5. 36 6. 81

7. $\frac{1}{2}$ 8. $\frac{1}{8}$ 9. $\frac{4}{9}$ 10. $\frac{3}{2}$ 11. $\frac{9}{4}$

12. $-\frac{1}{25}$ 13. $\frac{1}{25}$ 14. 4 15. 64 16. 9

17. 7 18. $\frac{1}{27}$ 19. 2^5 20. 2^0 21. 2^{10}

22. 2^{-1} 23. 2^{-3} 24. $2^{\frac{5}{2}}$ 25. $2^{\frac{1}{3}}$

26. -2^{-4} 27. not possible 28. 2^2 29. a^9

30. $25x^5$ 31. $3x^3y^3$ 32. $-6a^4b^5$ 33. c^8d^9

34. $72x^{12}y^9$ 35. $-\frac{z^{15}}{y^{10}}$ 36. $\frac{y}{4x^2}$ 37. $\frac{x^{16}}{y^{10}}$

38. $\frac{108x^{21}y^{13}}{25z^4}$

Lesson 2.3

1. no; domain: {1, 2}; range: {-2, -1, 1, 2}

2. yes; domain: {0, 1, 2, 3}; range: {0, 1, 2, 3}

3. yes; domain: {1, 2, 3, 4};
range: {-4, -3, -2, -1}

4. no; domain: {4, 9}; range: {-3, -2, 2, 3}

5. no; domain: $x \geq 0$; range: all real numbers

6. yes; domain: {-5, -3, -2, 0, 1, 3, 4};
range: {-4, -1, 0, 1, 3, 4}

7. 1 8. 5 9. $4\frac{2}{3}$ 10. $3\frac{1}{2}$ 11. -4

12. $1\frac{5}{8}$ 13. $4\frac{1}{3}$ 14. $18\frac{1}{3}$ 15. 0 16. 9

17. $f(t) = 60t$

18. $f(h) = 10 + 0.6h$

19. $f(e) = 6e^2$

20. $f(r) = \frac{4\pi}{3}r^3$

Lesson 2.4

1. $3x^2 + 2x + 1$

2. $2x^2 - 5x + 2$

3. $x^2 + 3x + 1$

4. $2x^3 + 9x^2 - 5x$

5. $2x^3 + 9x^2 - 5x$

ANSWERS

6. $4x^2 + 5x + 2$

7. $\frac{3x^2 + 2}{2x - 1}, x \neq \frac{1}{2}$

8. $\frac{x^2 + 5x}{2x - 1}, x \neq \frac{1}{2}$

9. $9x^2 - 1$

10. $3x^2 - 3$

11. $6 - x^2$

12. $5 - 3x$

13. $9x$ 14. x 15. 3 16. 63 17. 143

18. 135

Lesson 2.5

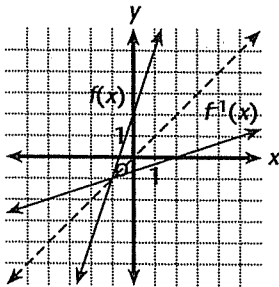
1. $f^{-1}(x) = \{(-1, -5), (3, 0), (5, 3), (6, 5)\}; 5; 5$

2. $f^{-1}(x) = 2x + 6; 5; 5$

3. $f^{-1}(x) = \frac{1}{7}x - \frac{4}{7}; 5; 5$

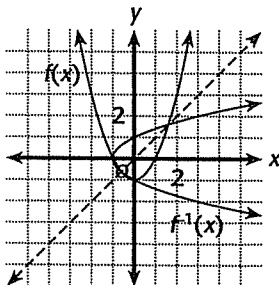
4. $f^{-1}(x) = \frac{5}{2}x - \frac{1}{2}; 5; 5$

5. $\{(-2, -4), (-1, -1), (0, 2), (1, 5), (2, 8)\}$



The inverse is a function.

6. $\{(-2, 3), (-1, 1), (0, -1), (1, 1), (2, 3)\}$



The inverse is not a function.

Lesson 2.6

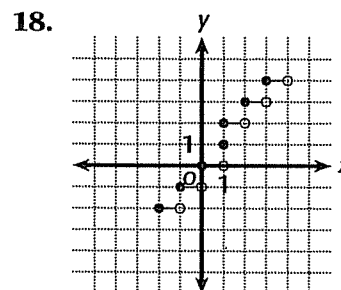
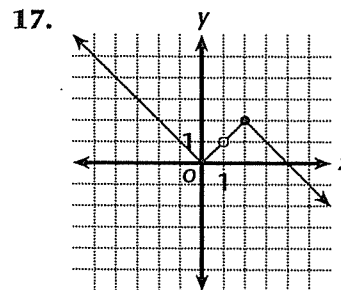
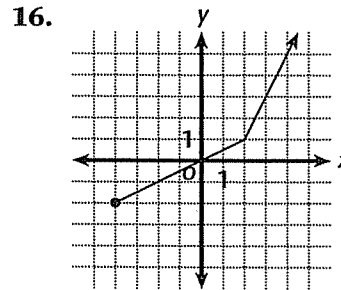
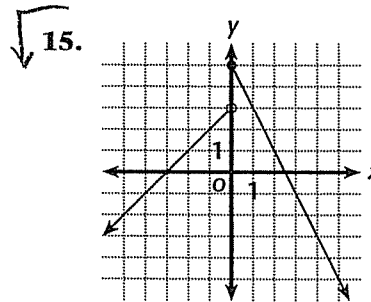
1. 4.2 2. 4 3. 5 4. 1.8 5. -2

6. -1 7. 9 8. -5 9. -5 10. 6

11. 0 12. 11.5

13. $f(m) = 0.12[m]$; \$1.92

14. $f(h) = 50 + 35[h]$; \$190



ANSWERS

Lesson 2.7

- $f(x) = x^2$; reflection across the x -axis and vertical translation 5 units up
- $f(x) = |x|$; horizontal translation 3 units to the right
- $f(x) = x^2$; horizontal translation 2 units to the left and vertical translation 3 units up
- $f(x) = \sqrt{x}$; reflection across the y -axis and vertical stretch by a factor of 2
- $f(x) = |x|$; horizontal compression by a factor of $\frac{1}{2}$
- $f(x) = \sqrt{x}$; reflection across the x -axis, vertical stretch by a factor of 2, and a horizontal translation 4 units to the left

7. $g(x) = (x - 3)^2 - 2$

8. $g(x) = -x^2 + 2$

9. $g(x) = |x + 3| + 1$

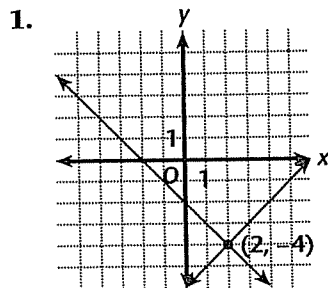
10. $g(x) = |2x| - 3$, or $g(x) = 2|x| - 3$

11. $g(x) = \sqrt{x + 2}$

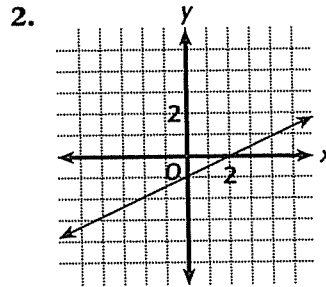
12. $g(x) = -1 - \sqrt{x + 3}$

Reteaching — Chapter 3

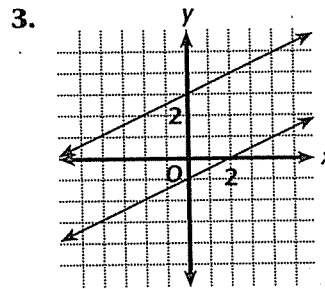
Lesson 3.1



intersecting, consistent, independent
(2, -4)



same line, consistent, dependent
all (x, y) such that $x - 2y = 2$



parallel lines, inconsistent, independent
no solution

4. (1, 2) 5. (3, 1) 6. (5, 7)

7. (-1, 1) 8. (3, -4) 9. (2, 5)

10. (1, 1) 11. (5, 1) 12. (6, 2)

Lesson 3.2

1. (1, 4) 2. (3, 1) 3. (5, 1) 4. (-4, 3)

5. (-2, -3) 6. (-2, 1) 7. (1, -1)

8. (-1, -4)

9. inconsistent

10. dependent

11. consistent, (-2, 0)

12. consistent, (-3, 4)

13. inconsistent

14. dependent

15. consistent, (2, -2)

16. dependent

ANSWERS

14. a. opens down
b. maximum
c. x-intercepts: -2 and 2
d. (0, 4)

15. a. opens up
b. minimum
c. x-intercepts: 1 and 2
d. (1.5, -0.25)

16. a. opens up
b. minimum
c. x-intercepts: 1 and -5
d. (-2, -9)

17. a. opens down
b. maximum
c. x-intercepts: -4 and 2
d. (-1, 9)

18. a. opens up
b. minimum
c. x-intercepts: -2 and 4
d. (1, -27)

Lesson 5.2

1. $\sqrt{60}$ and $-\sqrt{60}$; 7.75 and -7.75
2. $\sqrt{13}$ and $-\sqrt{13}$; 3.61 and -3.61
3. $\sqrt{10}$ and $-\sqrt{10}$; 3.16 and -3.16
4. 2 and -10
5. $5 + \sqrt{60}$ and $5 - \sqrt{60}$; 12.75 and -2.75
6. 3 and -5
7. $x = 13$
8. $x \approx 20.59$
9. $x = 12$
10. $x \approx 13.08$
11. $x \approx 21.66$
12. $x \approx 14.14$

Lesson 5.3

1. $(x + 5)(x - 4)$
2. $2(c - 7)(c + 2)$
3. $(a - 7)^2$
4. $(x + 1)^2$
5. $3(a + 2)(a - 1)$
6. $5(c + 4)(c - 4)$
7. $(2z - 7)(z + 4)$
8. $(x - 8)(x + 5)$
9. $5y(y - 16)$
10. $(5r + 13)(r + 2)$
11. $(3x + 1)(3x - 1)$
12. $(d + 15)(d - 5)$
13. 3 and 4
14. 0 and 2
15. 3 and 5
16. -5 and 0
17. $x = -\frac{3}{2}$
18. $a = 1$
19. 0 and $-\frac{4}{3}$
20. -7 and 7
21. -5 and 0
22. -6 and -2
23. $x = -5$
24. -4 and 4
25. 1 and 2
26. -3 and 3
27. -3 and 17

ANSWERS

Lesson 5.4

1. 9 2. 64 3. $\frac{25}{4}$
4. $-6 + \sqrt{32}$ and $-6 - \sqrt{32}$;
-11.66 and -0.34
5. $3 + \sqrt{3}$ and $3 - \sqrt{3}$; 1.27 and 4.73
6. -5 and 3
7. $5 + \sqrt{12}$ and $5 - \sqrt{12}$; 1.54 and 8.46
8. $6 + \sqrt{27}$ and $6 - \sqrt{27}$; 0.80 and 11.20
9. -11 and 1
10. vertex form: $y = 2(x - 0)^2 + 0$
vertex: (0, 0)
axis of symmetry: $x = 0$
11. vertex form: $y = -(x - 0)^2 + 5$
vertex: (0, 5)
axis of symmetry: $x = 0$
12. vertex form: $y = (x + 2)^2 - 4$
vertex: (-2, -4)
axis of symmetry: $x = -2$
13. vertex form: $y = (x - 1)^2 - 4$
vertex: (1, -4)
axis of symmetry: $x = 1$
14. vertex form: $y = (x + 3)^2 + 0$
vertex: (-3, 0)
axis of symmetry: $x = -3$
15. vertex form: $y = \left(x + \frac{3}{2}\right)^2 - \frac{25}{4}$
vertex: $\left(-\frac{3}{2}, -\frac{25}{4}\right)$
axis of symmetry: $x = -\frac{3}{2}$

Lesson 5.5

1. 2.24 and -6.24
2. 1 and -3.5
3. 1.85 and -4.85
4. 0.68 and -0.88
5. 2.04 and -1.75
6. 0.75 and -0.5
7. 1.25 and -1
8. 0.59 and 5.08
9. x -intercepts: -3 and 5
axis of symmetry: $x = 1$
vertex: (1, -16)
10. x -intercepts: -5 and -1
axis of symmetry: $x = -3$
vertex: (-3, -4)
11. x -intercepts: 0 and 3
axis of symmetry: $x = 1.5$
vertex: (1.5, 2.25)
12. x -intercepts: 0.5 and -2.5
axis of symmetry: $x = -1$
vertex: (-1, -9)
13. x -intercepts: -2 and 3
axis of symmetry: $x = 0.5$
vertex: (0.5, 6.25)
14. x -intercept: 1.5
axis of symmetry: $x = 1.5$
vertex: (1.5, 0)

Lesson 5.6

1. 24; 2 real solutions
2. -4; 2 nonreal solutions
3. 45; 2 real solutions
4. 0; 1 real solution
5. -8; 2 nonreal solutions

ANSWERS

6. 36; 2 real solutions

7. $5 + 3i$ and $5 - 3i$

8. 4 and 8

9. $-\frac{7}{12} + i\frac{\sqrt{23}}{12}$ and $-\frac{7}{12} - i\frac{\sqrt{23}}{12}$

10. $3 - 2i$

11. -16

12. $-1 - 3i$

13. $-11 + 7i$

14. $-14 + 2i$

15. 29

16. $\frac{9}{5} + \frac{7}{5}i$

17. $-\frac{1}{2} - \frac{7}{2}i$

18. $8 + 5i; \sqrt{89}$

19. $-2 - i; \sqrt{5}$

20. $-5 + 5i; \sqrt{50}$

Lesson 5.7

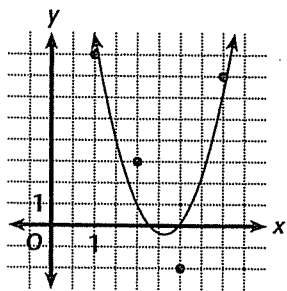
1. $f(x) = x^2 - 5x + 8$

2. $f(x) = 5x^2 - 7x$

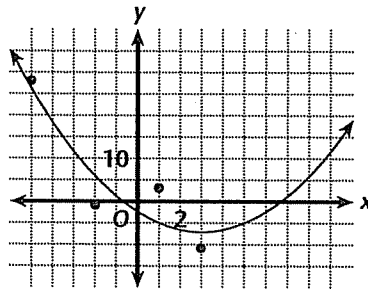
3. $f(x) = -2x^2 + 3$

4. $f(x) = -x^2 + x - 1$

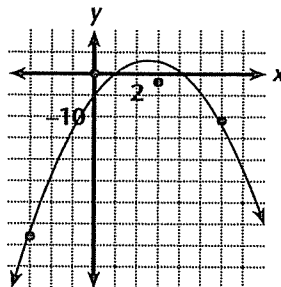
5. $f(x) = 3.5x^2 - 18.3x + 23.5$



6. $f(x) = 0.52x^2 - 3.10x - 2.69$

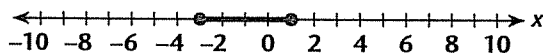


7. $f(x) = -1.31x^2 + 6.55x - 4.95$

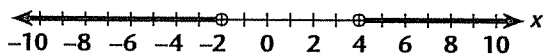


Lesson 5.8

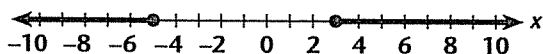
1. $-3 \leq x \leq 1$



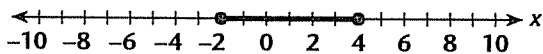
2. $x < -2$ or $x > 4$



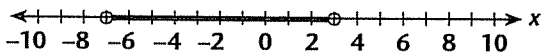
3. $x \leq -5$ or $x \geq 3$



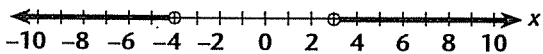
4. $-2 \leq x \leq 4$



5. $-7 < x < -1$

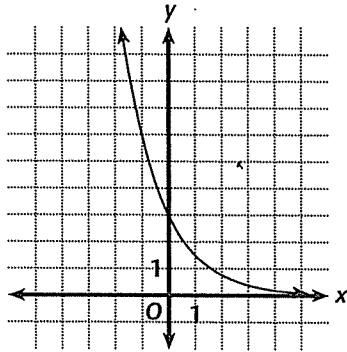


6. $x < -3$ or $x > 3$



ANSWERS

9. exponential decay



10. \$1246.18 11. \$1484.77
12. \$4026.30 13. \$12,589.30

Lesson 6.3

1. $\log_8 64 = 2$
2. $\log_3 27 = 3$
3. $\log_5 625 = 4$
4. $\log_{16} 4 = \frac{1}{2}$
5. $\log_5 \frac{1}{25} = -2$
6. $\log_{\frac{1}{64}} \frac{1}{8} = \frac{1}{2}$
7. $7^2 = 49$
8. $10^4 = 10,000$
9. $2^6 = 64$ 10. $2^{-3} = \frac{1}{8}$ 11. $8^1 = 8$
12. $5^0 = 1$ 13. $n = 2$ 14. $n = 4$
15. $n = 1$ 16. $n = 81$ 17. $n = 32$
18. $n = 1$ 19. $n = 5$ 20. $n = 10$
21. $n = \frac{1}{2}$ 22. $n = 0$ 23. $n = 3$
24. $n = \frac{1}{64}$ 25. $n = 7$ 26. $n = -4$
27. $n = 5$ 28. $n = 3$

Lesson 6.4

1. $\log_2 40$
2. $\log_5 10$
3. $\log_8 160$
4. $\log_3 3$
5. $\log_3 256$
6. $\log_6 \left(\frac{x^5}{y^3}\right)$
7. 1.1761 8. -0.2219 9. 1.398
10. 1.4313 11. 1.8751 12. 2.1303
13. 3 14. 13 15. 5 16. 8
17. -8 and 3 18. -4 and 4 19. 4 and 7

Lesson 6.5

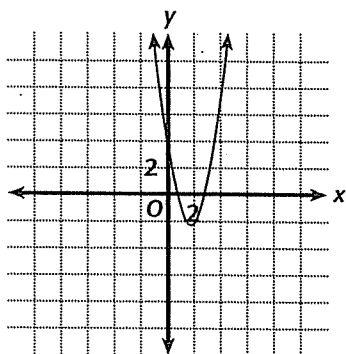
1. $x \approx 2.25$
2. $x \approx 1.43$
3. $x = 4$
4. $x \approx 2.32$ 5. $x \approx 7.64$ 6. $x = -1$
7. $x = 5$ 8. $x \approx 1.14$ 9. $x \approx 2.90$
10. ≈ 1.61 11. ≈ 2.86 12. ≈ 8.64
13. 3 14. ≈ 2.33 15. ≈ -4.58
16. ≈ 1.83 17. ≈ 4.73 18. -2.1

Lesson 6.6

1. 4 2. 15 3. 9 4. 9 5. 5 6. 15
7. $x \approx 3.53$
8. $x \approx 3.69$
9. $x \approx 4.08$
10. $x \approx 12.18$
11. $x \approx 6.15$

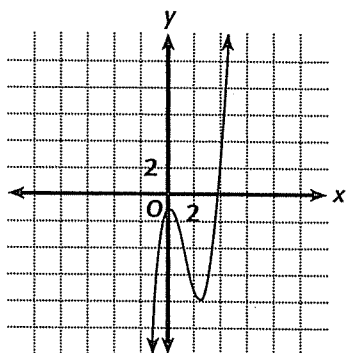
ANSWERS

16.



quadratic function; 1 turning point at approximately 2

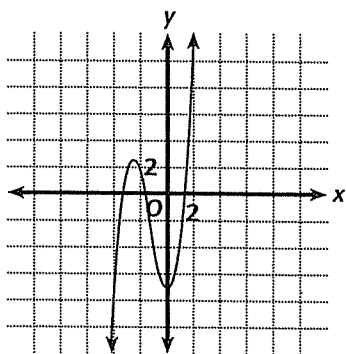
17.



cubic function; 2 turning points at approximately 0 and 2.5

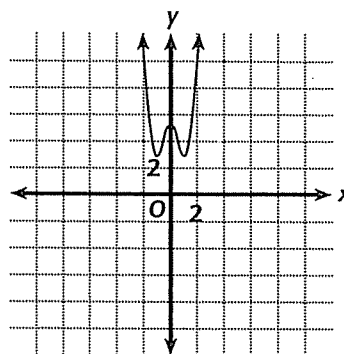
Lesson 7.2

1.



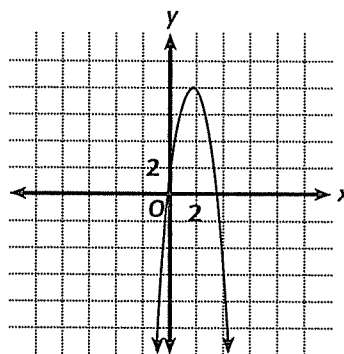
maximum at $(-2.7, 2.5)$;
minimum at $(0, -7)$; $x < -2.7, x > 0$;
 $-2.7 < x < 0$

2.



maximum at $(0, 5)$;
minimum at $(-1.2, 2.8)$ and $(1.2, 2.8)$;
 $-1.2 < x < 0$ and $x > 1.2$;
 $x < -1.2$ and $0 < x < 1.2$

3.



maximum at $(1.8, 8.1)$;
no minimum; $x < 1.8; x > 1.8$

4. rising on the left and the right, 2 turning points
5. falling on the left and the right, 2 turning points
6. falling on the left, rising on the right, 1 turning point
7. rising on the left, falling on the right, 1 turning point
8. rising on the left and the right, 4 turning points
9. rising on the left, falling on the right, 1 turning point
10. rising on the left and the right, 4 turning points

ANSWERS

11. falling on the left and the right,
4 possible turning points, but only 2 for
this function
12. falling on the left, rising on the right,
3 turning points
13. rising on the left, falling on the right,
3 possible turning points, but only 1 for
this function

Lesson 7.3

1. $3x^3 + 5x^2 - 17x - 15$
2. $x^4 - 6x^3 - 10x^2 + 2x + 5$
3. $2x^3 + 11x^2 + 2x - 15$
4. $x^3(x + 1)(x^2 - x + 1)$
5. $2x(2x + 7)(2x - 7)$
6. $(2x - 3)(x + 1)(x - 1)$
7. yes 8. yes 9. no
10. $x^2 + 5x + 5$
11. $x - 7$
12. 121
13. 12

Lesson 7.4

- * 1. -3 and $\frac{1}{2}$ occurring twice
2. 1, 2, and -3
- * 3. -6, 4, and $\frac{3}{2}$
4. 5 occurring 3 times
- * 5. 8 and -2 occurring twice
6. 0, 4, and -4
7. 2, -2, 3, and -3
8. 3, -3, $\sqrt{\frac{5}{2}}$, and $-\sqrt{\frac{5}{2}}$
9. -1.2, 1.8, and 3.4

10. -0.6 and 4.6

Lesson 7.5

- * 1. -3, $1 + 2i$, and $1 - 2i$
- * 2. -2, 3, $-1 + i$, and $-1 - i$
3. 2, $1 + \sqrt{3}$, and $1 - \sqrt{3}$
4. 1, -1, 2, and -3
5. $x \approx 1.32$
6. -0.53, 0.65, and 2.88
7. $P(x) = -5x^2 + 10x + 15$
8. $P(x) = x^4 - 16$

Reteaching — Chapter 8

Lesson 8.1

1. direct variation
2. inverse variation
3. direct variation
4. $y = 25$
5. $y = 0.25$
6. $y = 14$
7. $y = 0.9375$
8. $y = 0.004$
9. $y = \frac{1}{2}$
10. $y = 245$
11. $y = 5$
12. $y = 60$
13. $y = 0.504$
14. F varies jointly as m_1 and m_2 and inversely
as r squared.

ANSWERS

Lesson 8.2

1. all real numbers, $x \neq 4, -4$
 2. all real numbers, $x \neq 0, -7$
 3. all real numbers, $x \neq 7, -3$
 4. hole at $x = -2$; vertical asymptote: $x = -3$
 5. no holes; vertical asymptotes: $x = -4$ and $x = 1$
 6. hole at $x = 3$; vertical asymptote: $x = -2$
 7. hole at $x = 1$; no vertical asymptotes
 8. $y = \frac{5}{2}$
 9. no horizontal asymptote
 10. $y = 0$

Lesson 8.3

- * 1. $\frac{3}{x-3}$
 2. $\frac{y+5}{y+4}$
 * 3. $\frac{7}{15x^2}$
 4. $4a^4$
 * 5. $\frac{x(x-5)}{2(x+4)}$
 6. $\frac{y+3}{4}$
 * 7. $\frac{4}{5x^2}$
 8. 1
 * 9. $\frac{x(x-1)}{3(x+1)}$
 10. $\frac{4(a-3)}{a(a+5)}$
 * 11. $\frac{12x}{x+3}$
 12. $\frac{x+5}{2}$

Lesson 8.4

1. 2 2. $x+4$
 3. $\frac{3x-7}{x-5}$
 4. $\frac{3}{x-3}$
 5. $2y(y+2)$
 6. $5a(a+2)(a-2)$
 7. $5(x+1)(x-1)(x+7)$
 8. $(x+2)(x-1)(x-5)$
 9. $x(x-3)(x+7)(x-7)$
 10. $\frac{41}{42x}$
 11. $\frac{-3y}{2(y-2)}$
 12. $\frac{11x+21}{(x+6)(2x-3)}$
 13. $\frac{5(a+4)}{a(a+2)(a-2)}$
 14. $\frac{2}{(x-2)(x-4)}$
 15. $\frac{-(x-1)}{x(x+1)}$

Lesson 8.5

- * 1. $x = -9$
 * 2. $x = -\frac{7}{2}$
 * 3. $x = 5$
 4. $x = -\frac{1}{2}, 6$
 5. $x = -5$
 6. $x = 5$
 7. $-2.5 < x < 0$
 8. $x < -4$ or $x > -2$
 9. $-3 < x < 0$ or $x > 1$
 10. $-2.4 < x < 0$ or $x > 0.4$

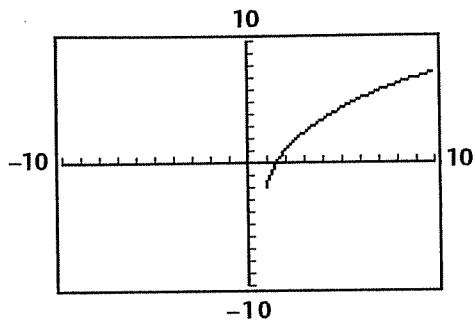
ANSWERS

Lesson 8.6

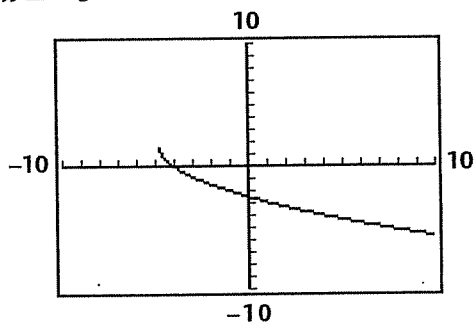
1. 25 2. 25 3. 0

4. 1 5. $-\frac{1}{3}$ 6. 8i

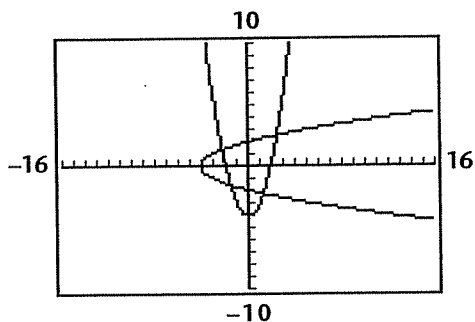
7. $x \geq 1$



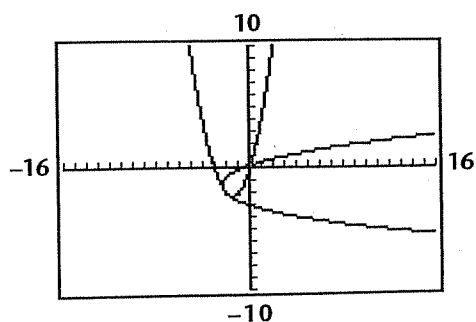
8. $x \geq -5$



9. $y = \pm\sqrt{x+4}$



10. $y = \frac{-3 \pm \sqrt{4x+9}}{2}$



Lesson 8.7

1. $4|x|y^2\sqrt{3x}$

2. $2|x^3|y^2\sqrt{2y}$

3. $5m^6\sqrt{6}$

4. $5|a||b|c^2\sqrt{7b}$

5. $3x^2\sqrt[3]{2}$

6. $2r^2s^2\sqrt[5]{r^2}$

7. $6x^2$

8. $6x^3\sqrt{x}$

9. $5x^2y^4\sqrt{3}$

10. $3xy\sqrt{x}$

11. $6a$

12. $3a^5b^3\sqrt{2}$

13. -2

14. $2x - 7\sqrt{x} - 4$

15. $21 - 21\sqrt{2}$

16. $6y - 4$

17. $\frac{3\sqrt{2}}{2}$

18. $\frac{\sqrt{21}}{7}$

19. $12 + 8\sqrt{2}$

Lesson 8.8

1. $x = 11$

2. $x = 2$

3. $x = -\frac{1}{3}$

4. $x \leq -5$ or $x \geq 5$

5. $x \leq 7$

6. no solution