Chapter 8, Form A

1. Find the intersection and union of the given sets. 1. _____

   $A = \{m, a, g, i, c\}$ $B = \{m, a, t, h\}$ _____

For Exercises 2–5, solve.

2. $|2x - 3| = 5$ 2. _____

3. $|2 - z| + 4 = 6$ 3. _____

4. $|4x + 3| = |9 - 2x|$ 4. _____

5. $|5x - 12| = -23$ 5. _____

For Exercises 6–15, solve, and then
- ***a) Graph the solution set.***
- ***b) Write the solution set in set builder notation.***
- ***c) Write the solution set in interval notation.***

6. $-3 \le 2x + 5 < 7$ 6. a)

   b) _____

   c) _____

7. $-2 < -x + 3 \le 5$ 7. a)

   b) _____

   c) _____

8. $3a - 2 < 10$ and $-2a + 2 < 12$ 8. a)

   b) _____

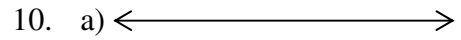
   c) _____

9. $3x + 2 < 8$ or $2x - 3 > 11$ 9. a)

   b) _____

   c) _____

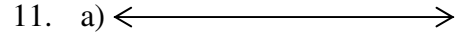
10. $|2x-4|<2$

10. a) 

b)_____

c)_____

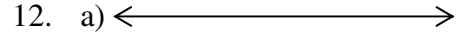
11. $3|4-x|>6$

11. a) 

b)_____

c)_____

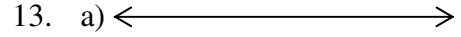
12. $4-2|2x+3|\geq -18$

12. a) 

b)_____

c)_____

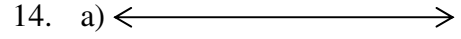
13. $|5y-5|<-10$

13. a) 

b)_____

c)_____

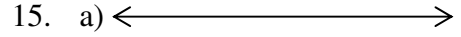
14. $|2x-6|\geq -6$

14. a) 

b)_____

c)_____

15. $3|2x+5|\leq 9$

15. a) 

b)_____

c)_____

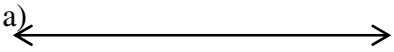
For Exercise 16, solve. Then

a. Graph the solution set.

b. Write the solution set using set-builder notation.

c. Write the solution set using interval notation.

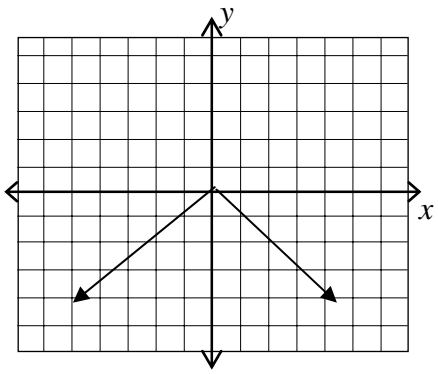
16. A book club offers one bonus book if the total of an order is between \$30 and \$60. John decides to buy the lowest price books, which are \$6 each. What range would the number of books he orders have to be in order to receive a bonus book?

16. a) 

b) _____

c) _____

17. Identify the domain and range of the relation, then determine whether it is a function.



17. _____

_____

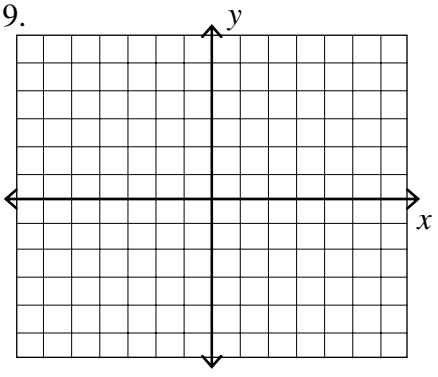
_____

18. Given $f(x) = x^2 - 2x + 1$, find $f(-3)$.

18. _____

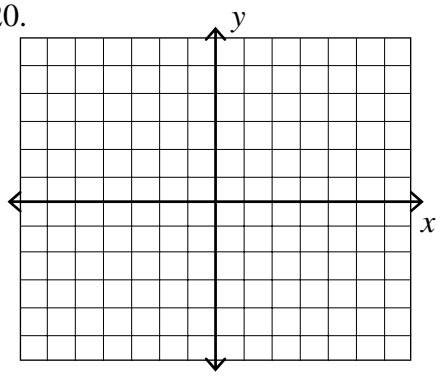
For Exercise 19–21, graph.

19. $f(x) = -\frac{2}{3}x + 3$

19. 

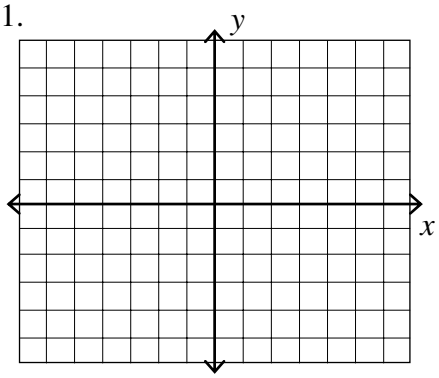
20. $f(x) = x^2 - 5$

20.



21. $f(x) = |x + 3| - 2$

21.



For Exercises 22 and 23, find

a) $f + g$
b) $f - g$
c) $f \bullet g$

22. $f(x) = 3x - 8,\ g(x) = 2x + 3$

22. a)_____

b)_____

c)_____

23. $f(x) = 2x^2 - 1,\ g(x) = 3x^2 + 2$

23. a)_____

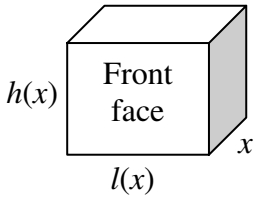
b)_____

c)_____

24. Given $f(x) = 10x^4 - 5x^3 - 15x^2$ and $g(x) = 5x^2$, find f / g.

24. _____

25. The function $A(x) = 12x^2 + 11x - 5$ describes the area of the front face of a box and $l(x) = 4x + 5$ describes the length, where x represents its width.



a) Find the function, $h(x)$, that describes the height of the box.
b) Calculate the height of the box if $x = 4$ cm.

25. a)_____

b)_____

Chapter 8, Form B

1. Find the intersection and union of the given sets. 1. _____

   $A = \{a, e, i, o, u\}$ $B = \{v, o, w, e, l\}$ _____

For Exercises 2–5, solve.

2. $|2x + 3| = 19$ 2. _____

3. $2 - |3 - z| = -3$ 3. _____

4. $|4 - 2y| = |8 - y|$ 4. _____

5. $|5x + 7| = -8$ 5. _____

For Exercises 6–15, solve, and then

a) Graph the solution set.
b) Write the solution set in set builder notation.
c) Write the solution set in interval notation.

6. $-1 \le x + 1 < 8$ 6. a)

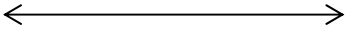
   b)_____

   c)_____

7. $2 < -2x \le 6$ 7. a) 

   b)_____

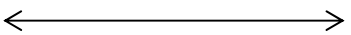
   c)_____

8. $1 - 4a \ge 9$ or $5a + 3 \le -12$ 8. a) 

   b)_____

   c)_____

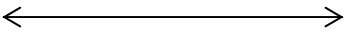
9. $x+1>3$ or $1-4x>5$

9. a) 

b)_____

c)_____

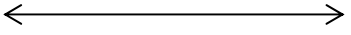
10. $|y-1|<4$

10. a) 

b)_____

c)_____

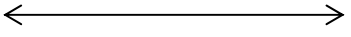
11. $2|2x+1|\geq 10$

11. a) 

b)_____

c)_____

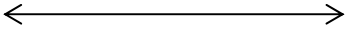
12. $3-2|x-2|>-5$

12. a) 

b)_____

c)_____

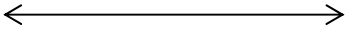
13. $|4y-2|<-6$

13. a) 

b)_____

c)_____

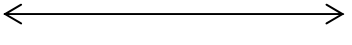
14. $|5x-8|\geq -2$

14. a) 

b)_____

c)_____

15. $2|x+4|\leq 14$

15. a) 

b)_____

c)_____

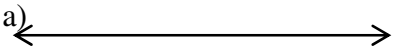
For Exercise 16, solve. Then

a. Graph the solution set.

b. Write the solution set using set-builder notation.

c. Write the solution set using interval notation.

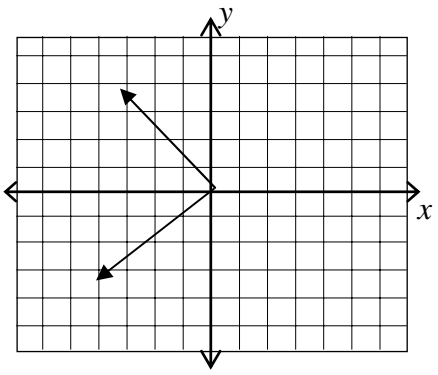
16. A book club offers one bonus book if the total of an order is between \$60 and \$90. John decides to buy the lowest price books, which are \$10 each. What range would the number of books he orders have to be in order to receive a bonus book?

16. a) 

b) _____

c) _____

17. Identify the domain and range of the relation, then determine whether it is a function.



17. _____

_____

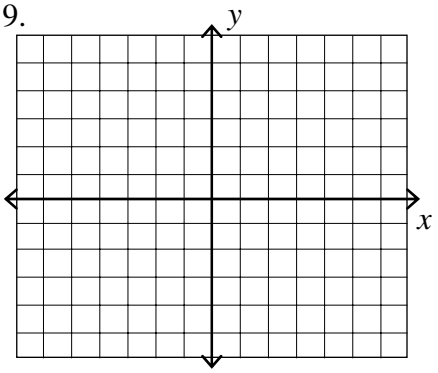
_____

18. Given $f(x) = 3x^2 - 2x + 1$, find $f(-2)$.

18. _____

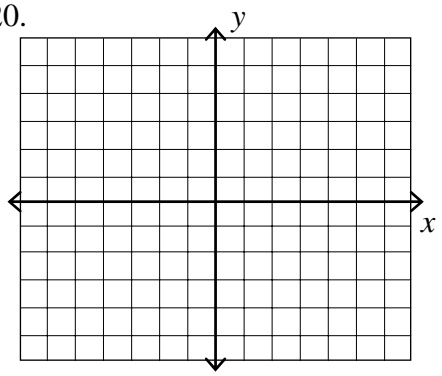
For Exercise 19–21, graph.

19. $f(x) = -\frac{1}{2}x + 4$

19. 

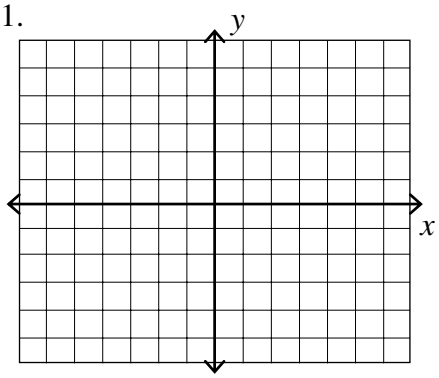
20. $f(x) = -x^2 - 3$

20.



21. $f(x) = |x+3| - 1$

21.



For Exercises 22 and 23, find

a) $f + g$
b) $f - g$
c) $f \bullet g$

22. $f(x) = 4x - 5,\ g(x) = x + 3$

22. a)_____

b)_____

c)_____

23. $f(x) = 2x^2 - 7\ \ g(x) = x^2 + 6$

23. a)_____

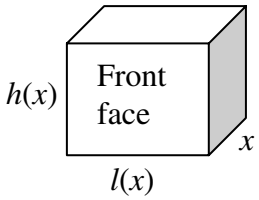
b)_____

c)_____

24. Given $f(x) = 12x^4 - 4x^3 - 8x^2$ and $g(x) = 4x^2$, find f / g.

24. _____

25. The function $A(x) = 6x^2 + x - 12$ describes the area of the front face of a box $\ell(x) = 3x - 4$ and describes the length, where x represents its width.



a) Find the function, $h(x)$, that describes the height of the box.

b) Calculate the height of the box if $x = 6$ cm.

25. a)_____

b)_____

Chapter 8, Form C

1. Find the intersection and union of the given sets. 1. _____

   $A = \{f, e, a, s, t\}$ $B = \{m, e, a, l\}$ _____

For Exercises 2–5, solve.

2. $|2x + 3| = 7$ 2. _____

3. $|7 - 2z| - 3 = 11$ 3. _____

4. $|2x - 1| = |5 - x|$ 4. _____

5. $|7x - 3| = -10$ 5. _____

For Exercises 6–15, solve, and then

a) Graph the solution set.
b) Write the solution set in set builder notation.
c) Write the solution set in interval notation.

6. $-4 \le 2x - 2 < 6$ 6. a)

   b)_____

   c)_____

7. $3 < -2x - 1 \le 7$ 7. a)

   b)_____

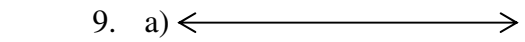
   c)_____

8. $4a + 2 < -2$ and $4a + 2 \le 6$ 8. a)

   b)_____

   c)_____

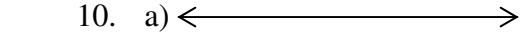
9. $3-6x \le -3$ or $3-6x > 3$

9. a) 

b)_____

c)_____

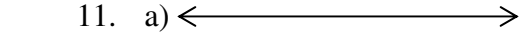
10. $|x+2| < 5$

10. a) 

b)_____

c)_____

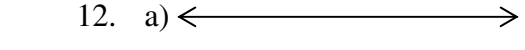
11. $2|a-5| \ge 4$

11. a) 

b)_____

c)_____

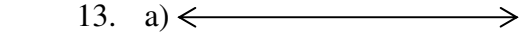
12. $4-2|x+2| > -8$

12. a) 

b)_____

c)_____

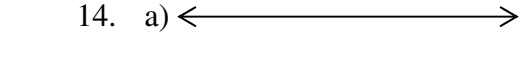
13. $|3y-5| < -4$

13. a) 

b)_____

c)_____

14. $|5x-2| \ge -12$

14. a) 

b)_____

c)_____

15. $-3|2x-1| \le -9$

15. a)

b)_____

c)_____

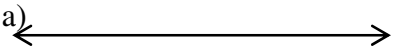
For Exercise 16, solve. Then

a. Graph the solution set.

b. Write the solution set using set-builder notation.

c. Write the solution set using interval notation.

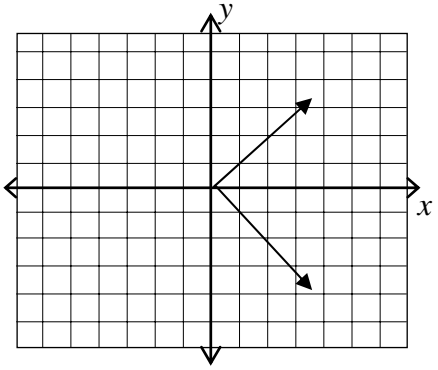
16. A music club offers one bonus CD if the total of an order is between \$36 and \$55. Joey decides to buy the lowest price CDs, which are \$9 each. What range would the number of CDs he orders have to be in order to receive a CD?

16. a) 

b) _____

c) _____

17. Identify the domain and range of the relation, then determine whether it is a function.



17. _____

_____

_____

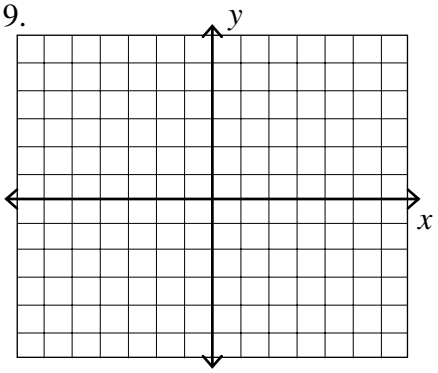
18. Given $f(x) = 2x^2 - 3x + 4$, find $f(-1)$.

18. _____

For Exercise 19–21, graph.

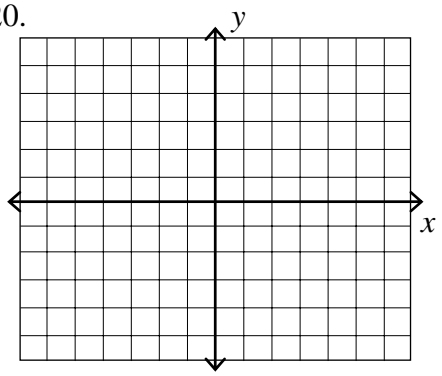
19. $f(x) = -\frac{2}{3}x + 1$

19.



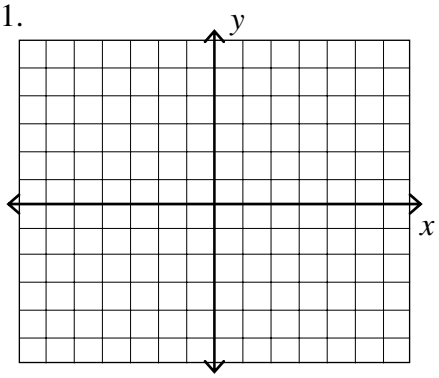
20. $f(x) = 2x^2 - 1$

20.



21. $f(x) = |x - 1| - 1$

21.



For Exercises 22 and 23, find

a) $f + g$
b) $f - g$
c) $f \bullet g$

22. $f(x) = 3x - 2,\ g(x) = 2x + 3$

22. a)_____

b)_____

c)_____

23. $f(x) = 3x^2 - 4,\ g(x) = 2x^2 + 1$

23. a)_____

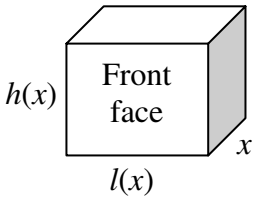
b)_____

c)_____

24. Given $f(x) = 4x^4 - 8x^3 - 12x^2$ and $g(x) = 4x^2$, find f / g.

24. _____

25. The function $A(x) = 21x^2 - 23x - 20$ describes the area of the front face of a box and $l(x) = 7x + 4$ describes the length, where x represents its width.



a) Find the function, $h(x)$, that describes the height of the box.

b) Calculate the height of the box if $x = 3$ cm.

25. a)_____

b)_____

Chapter 8, Form D

1. Find the intersection and union of the given sets. 1. _____

   $A = \{0, 2, 4, 6\}$ $B = \{1, 2, 3, 4\}$ _____

For Exercises 2–5, solve.

2. $|3x + 9| = 9$ 2. _____

3. $|17 - z| + 5 = 9$ 3. _____

4. $|9 - 4x| = |2x - 3|$ 4. _____

5. $|2x - 1| = -1$ 5. _____

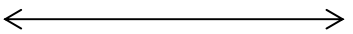
For Exercises 6–15, solve, and then

a) Graph the solution set.
b) Write the solution set in set builder notation.
c) Write the solution set in interval notation.

6. $2 < 3x - 2 \leq 10$ 6. a)

   b)_____

   c)_____

7. $5 \leq 2 - x \leq 6$ 7. a) 

   b)_____

   c)_____

8. $2x + 1 < 8$ and $-4 \geq 4 - 4x$ 8. a)

   b)_____

   c)_____

9. $4 - x > 8$ or $\frac{x}{2} \geq 7$

9. a) $\longleftrightarrow$

b)_____

c)_____

10. $|2x + 3| \leq 2$

10. a) $\longleftrightarrow$

b)_____

c)_____

11. $|3(x + 2)| < 12$

11. a) $\longleftrightarrow$

b)_____

c)_____

12. $1 + 5|x - 1| \leq 6$

12. a) $\longleftrightarrow$

b)_____

c)_____

13. $|4x - 2| < -6$

13. a) $\longleftrightarrow$

b)_____

c)_____

14. $|x + 1| - 9 > -2$

14. a) $\longleftrightarrow$

b)_____

c)_____

15. $3|2x - 3| \leq 9$

15. a) $\longleftrightarrow$

b)_____

c)_____

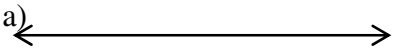
For Exercise 16, solve. Then

a. Graph the solution set.

b. Write the solution set using set-builder notation.

c. Write the solution set using interval notation.

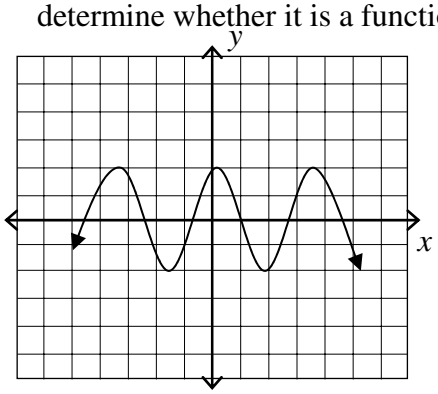
16. The width of a rectangular building is to be 40 feet. What range of values can the length have so that the area is between 6000 and 8000 square feet?

16. a) 

b) _____

c) _____

17. Identify the domain and range of the relation, then determine whether it is a function.



17. _____

_____

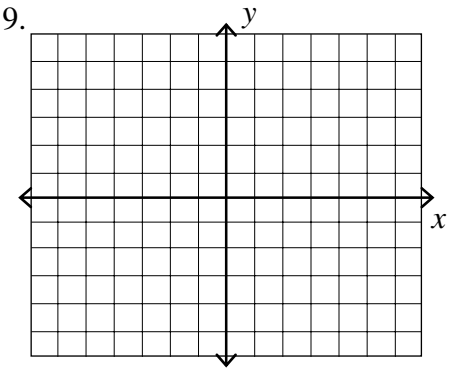
_____

18. Given $f(x) = 3x^2 - 2x + 1$, find $f(-2)$.

18. _____

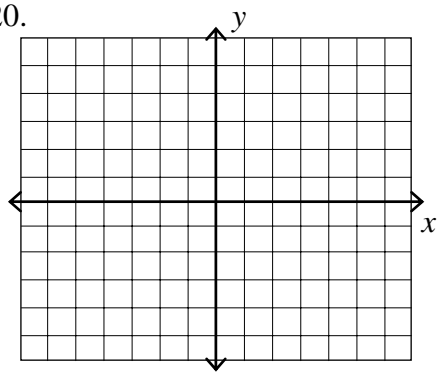
For Exercise 19–21, graph.

19. $f(x) = -\frac{1}{2}x + 2$

19. 

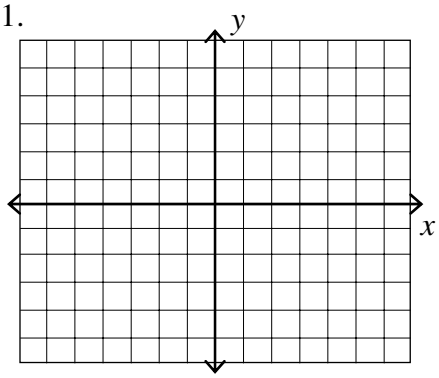
20. $f(x) = x^2 - 5x$

20.



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

21.



For Exercises 22 and 23, find

a) $f + g$
b) $f - g$
c) $f \bullet g$

22. $f(x) = 4x^2 - 3x + 2,\ g(x) = 6x + 5$

22. a)_____

b)_____

c)_____

23. $f(x) = 2x^2 - x + 3,\ g(x) = -3x^2 + 6$

23. a)_____

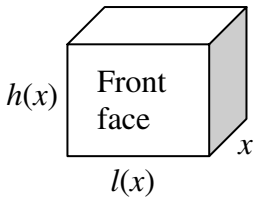
b)_____

c)_____

24. Given $f(x) = 6x^2 - 5x + 4$ and $g(x) = 2x - 1$, find f / g.

24. _____

25. The function $A(x) = 3x^2 + 11x - 20$ describes the area of the front face of a box and $l(x) = 3x - 4$ describes the length, where x represents its width.



a) Find the function, $h(x)$, that describes the height of the box.

b) Calculate the height of the box if $x = 5$ cm.

25. a)_____

b)_____

Chapter 8, Form E

1. Find the intersection of the given sets. 1. _____

   $A = \{2, 4, 6\}$ $B = \{1, 3, 5\}$

   (a) $\{2, 4, 6, 1, 3, 5\}$ (b) $\{1, 2, 3, 4, 5\}$ (c) $\{1, 2, 3, 4, 5, 6\}$ (d) Ø

For Exercises 2–5, solve.

2. $|y - 1| = 8$ 2. _____

   (a) -7 (b) $-7, 9$ (c) $-9, 7$ (d) 7

3. $|42 - x| = 5$ 3. _____

   (a) -37 (b) 37 (c) 47 (d) 37,47

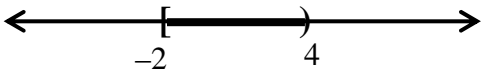
4. $|1 - 2x| = |3x - 2|$ 4. _____

   (a) $-1, -\frac{3}{5}$ (b) $\frac{3}{5}$ (c) -1 (d) $\frac{3}{5}, 1$

5. $|1 + 2a| = -3$ 5. _____

   (a) -2 (b) -2 (c) $-2, -1$ (d) No solution

6. Match the graph with the inequality. 6. _____



   (a) $-2 \le x \le 4$ (c) $-2 < x \le 4$

   (b) $-2 \le x < 4$ (d) $-2 < x < 4$

7. The solution of the inequality $6 < 3 - x \le 8$ is: 7. _____

   (a) $-3 < x \le -5$ (c) $-5 \le x < -3$

   (b) $8 > x \ge 11$ (d) $3 < -x \le 5$

8. Solve $-x \geq 5$ or $-x \leq -2$ 8._____

(a) $(-\infty, -5] \cup [2, \infty)$ (c) $[-\infty, -5] \cup [2, \infty]$

(b) $(-\infty, -2] \cup [5, 8)$ (d) $[2, \infty)$

9. Solve $5x - 5 > 10$ and $5x + 8 \leq 48$ 9._____

(a) $(-\infty, 3] \cup [8, \infty)$ c) $(3, 8]$

(b) $(-\infty, 3] \cup (8, \infty)$ (d) $(3, \infty)$

10. Which of the following has no solution? 10._____

(a) $|x - 5| \leq -3$ (c) $|x - 5| \geq 3$

(b) $|x - 5| > 0$ (d) $|x - 5| \leq 3$

11. The inequality $|x - 3| \leq 11$ has which of the following solutions? 11._____

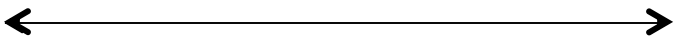
(a) $-14 \leq x \leq 8$ (b) $-14 < x \leq 8$ (c) $-8 \leq x \leq -14$ (d) $-8 \leq x \leq 14$

12. Solving the inequality $|x + 1| \geq 5$ has which of the following solutions? 12._____

(a) $-6 \leq x \leq 4$ (c) $x < -6$ and $x > 4$

(b) $x \leq -6$ or $x \geq 4$ (d) $-6 < x < 4$

13. Choose the inequality that represents the graph below. 13._____

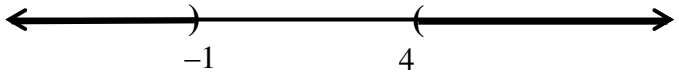


(a) $|x - 7| \leq 0$ (b) $|x - 7| \geq 0$ (c) $|x - 7| < 0$ (d) $|x| \leq 7$

14. Choose the inequality that represents the graph below. 14._____

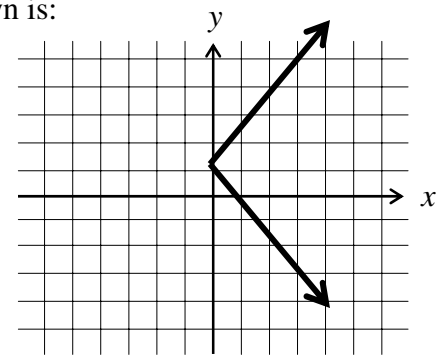
(a) $|1 - 2x| > -1$ (b) $|2x - 1| < 1$ (c) $|2x - 1| < -1$ (d) $|2x - 1| > 0$

15. Choose the inequality that represents the graph below. 15._____



(a) $\left|x - \frac{3}{2}\right| > \frac{5}{2}$ (b) $\left|x - \frac{3}{2}\right| > -\frac{5}{2}$ (c) $\left|x - \frac{3}{2}\right| < \frac{5}{2}$ (d) $\left|x + \frac{3}{2}\right| < \frac{5}{2}$

16. The domain and range of the graph shown is: 16. _____



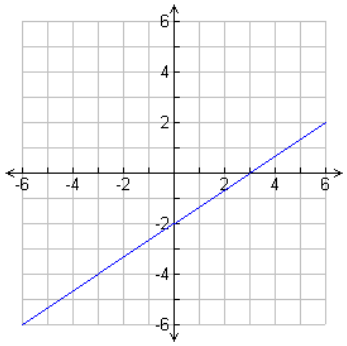
(a) D: $\{x|x > -1\}$ R: $\{y|y \geq 0\}$ (c) D: $\{x|x \geq 1\}$ R: $\{y|y \geq 1\}$

(b) D: $\{x|x \geq -1\}$ R: $\{y|y \geq -1\}$ (d) none of these

17. Given: $f(x) = -2x^3 - 3x + 6$, find $f(2)$. 17. _____

(a) -28 (b) -20 (c) -16 (d) -7

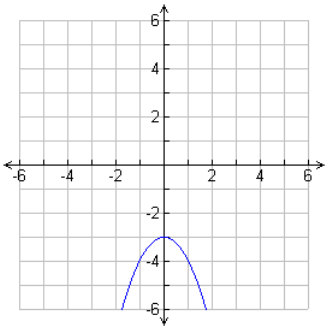
18. Which of the following is graphed here? 18. _____



(a) $f(x) = \frac{2}{3}x - 2$ (c) $f(x) = -\frac{2}{3}x - 2$

(b) $f(x) = -\frac{3}{2}x - 2$ (d) $f(x) = \frac{3}{2}x - 2$

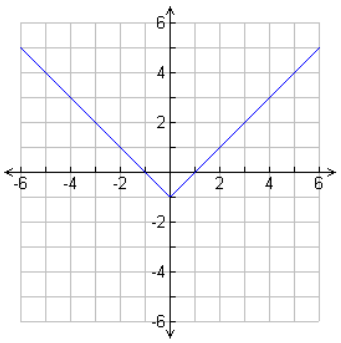
19. Which of the following is graphed here? 19. _____



(a) $f(x) = x^2 + 3$ (c) $f(x) = x^2 - 3$

(b) $f(x) = -x^2 - 3$ (d) $f(x) = -x^2 + 3$

20. Which of the following is graphed below? 20. _____



(a) $f(x) = |x| - 1$ (c) $f(x) = |x| + 1$

(b) $f(x) = |x + 1|$ (d) $f(x) = |x - 1|$

21. Find $f + g$ if $f(x) = -5x + 1$ and $g(x) = 7x - 3$. 21. _____

(a) $-12x + 4$ (c) $2x - 2$

(b) $2x - 3$ (d) $3x + 8$

22. Find $f \cdot g$ if $f(x) = 4x + 2$ and $g(x) = 4x - 2$. 22. _____

(a) $8x^2 - 4$ (b) $16x^2 + 16x - 4$ (c) $8x^2 + 12x - 4$ (d) $16x^2 - 4$

23. Given $f(x) = 21x^2 + 26x + 8$ and $g(x) = 3x + 2$, find f / g. 23. _____

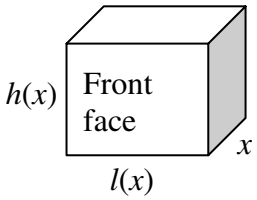
(a) $x + 7$ (c) $7x + 7$

(b) $7x + 4$ (d) $21x^2 + 23x + 6$

24. To earn a grade of B, a student must earn an average of at least 80 points on five tests. A student's grades on the first four tests were 79, 83, 89, and 75. How many points must the student score on the fifth test to earn a grade of B? 24. _____

(a) $x > 72$ (b) $x < 72$ (c) $x \geq 74$ (d) $x \leq 74$

25. The function $A(x) = 4x^4 - 9x^2 + 2x - 3$ describes the area of the front face of a box and $l(x) = 2x - 3$ describes the length, where x represents its width. 25. _____



Find the function, $h(x)$, that describes the height of the box.

(a) $2x^3 + 3x^2 - 1$ (b) $2x^3 - 3x^2 - 1$ (c) $2x^3 - 3x^2 + 1$ (d) $2x^3 + 3x^2 + 1$

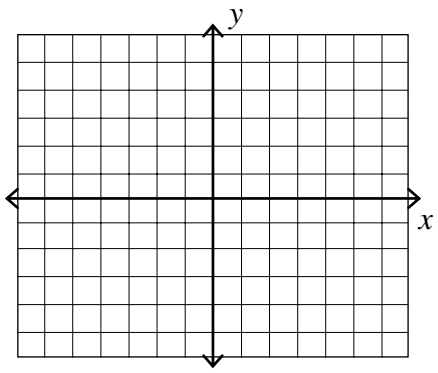
For Exercises 1–3, determine whether the given ordered pair or triple is a solution to the given system of equations.

1. $(-3, 2)$; $\begin{cases} 3x - y = -7 \\ 5x - y = -13 \end{cases}$ 1. _____

2. $(1, 2)$; $\begin{cases} 2x - y = 0 \\ 2x + 3y = 8 \end{cases}$ 2. _____

3. $(1, -1, 2)$; $\begin{cases} x + y + z = 2 \\ x - 2y + z = 1 \\ -2x - y + z = 1 \end{cases}$ 3. _____

4. Solve $\begin{cases} x + 2y = 4 \\ 2x + 3y = 6 \end{cases}$ by graphing. 4. _____



For Exercises 5–11, solve the system of equations using substitution or elimination. Note that some systems may be inconsistent or consistent with dependent equations.

5. $\begin{cases} 2x - y = 3 \\ y = -x \end{cases}$ 5. _____

6. $\begin{cases} 2x - y = 1 \\ 3x + y = -6 \end{cases}$ 6. _____

7. $\begin{cases} 4x-5y=-4 \\ 3x-2y=-3 \end{cases}$ 7. _____

8. $\begin{cases} 3x-y=14 \\ 6x-2y=10 \end{cases}$ 8. _____

9. $\begin{cases} x+2y+3z=6 \\ x-y+z=1 \\ 2x+y-z=2 \end{cases}$ 9. _____

10. $\begin{cases} 3x+12y-4z=-2 \\ 2x-12y+z=17 \\ 4x-8y-6z=-6 \end{cases}$ 10. _____

11. $\begin{cases} 2x+4y+6z=18 \\ 2x+3y-z=-2 \\ 3x+5y-2z=-5 \end{cases}$ 11. _____

For Exercises 12–14, solve the system of equations using the echelon method.

12. $\begin{cases} 5x+3y=6 \\ 2x-4y=5 \end{cases}$ 12. _____

13. $\begin{cases} -4x-9y=7 \\ 2x-y=13 \end{cases}$ 13. _____

14. $\begin{cases} x+y+2z=0 \\ 3x-y+3z=2 \\ 2x+3y+z=7 \end{cases}$ 14. _____

For Exercises 15–17, solve the system of equations using Cramer's Rule.

15. $\begin{cases} 4x-3y=8 \\ 2x+y=14 \end{cases}$ 15. _____

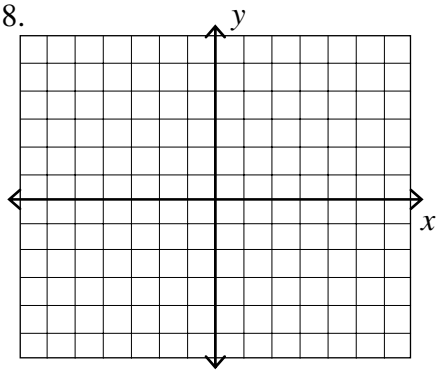
16. $\begin{cases} 3x+4y=10 \\ 4x+5y=14 \end{cases}$ 16. _____

17. $\begin{cases} x-2y-z=2 \\ 2x-y+z=7 \\ 3x+2y+z=2 \end{cases}$ 17. _____

For Exercise 18, graph the solution set for the system of inequalities.

18. $\begin{cases} x+3y \le 0 \\ 2x+y \le 5 \end{cases}$

18.



For Exercises 19–25, solve.

19. Three candy bars and one drink cost $2.30. Two candy bars and four drinks cost $3.70. What is the cost of a candy bar? 19. _____

20. The perimeter of a rectangle is 72 feet. The width is 8 feet less than the length. What are its dimensions? 20. _____

21. Ken has 30 coins consisting of nickels and dimes. If the value of the coins is $2.30, how many of each type does he have? 21. _____

22. Todd invested $10,000 in two funds paying 8% and 10% simple interest. The combined interest for both funds was $880. How much was invested at each rate? 22. _____

23. Solution A is 30% alcohol. Solution B is 50% alcohol. How many ounces of each would be needed to obtain 40 ounces of a mixture that is 45% alcohol? 23. _____

24. A total of 1000 tickets were sold for the play. The tickets were priced at \$4, \$5, and \$10. If twice as many \$4 tickets were sold as \$5 tickets, and the total receipts were \$4900, how many tickets at each price were sold?

24. _____

25. The manager of an art store wants to purchase at least 30 prints for the store. The artist will sell him small prints for \$40 and large prints for \$60. The manager cannot spend more than \$1600 for the prints.

    a) Write a system of inequalities to describe the situation.
    b) Solve the system of inequalities.

25. a) _____

    b) _____

Chapter 9, Form B

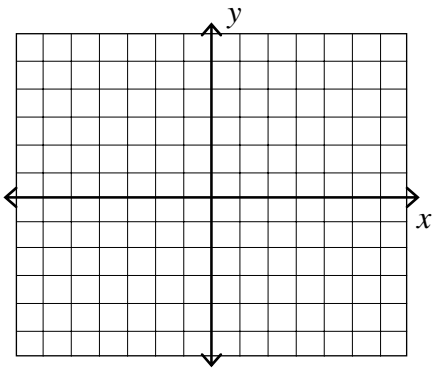
For Exercises 1–3, determine whether the given ordered pair or triple is a solution to the given system of equations.

1. $(0, \frac{1}{2})$; $\begin{cases} 7x - 2y = -1 \\ 5x + 4y = 2 \end{cases}$ 1. _____

2. $(1, -1)$; $\begin{cases} 3x - y = 2 \\ 5x - y = 6 \end{cases}$ 2. _____

3. $(2, 4, -1)$; $\begin{cases} x + y + 6z = 0 \\ 3x - y + 2z = 0 \\ 2x + 3y + 8z = 8 \end{cases}$ 3. _____

4. Solve $\begin{cases} 2x + 3y = 12 \\ x - y = 1 \end{cases}$ by graphing. 4. _____



For Exercises 5–11, solve the system of equations using substitution or elimination. Note that some systems may be inconsistent or consistent with dependent equations.

5. $\begin{cases} x + y = 4 \\ 3x - y = 0 \end{cases}$ 5. _____

6. $\begin{cases} x - y = -3 \\ 3x + y = -1 \end{cases}$ 6. _____

7. $\begin{cases} 2x - 5y = -14 \\ 3x + 4y = 2 \end{cases}$ 7. _____

8. $\begin{cases} 4x - 9y = 3 \\ -8x + 18y = 3 \end{cases}$ 8. _____

9. $\begin{cases} 3x + 4y - z = -12 \\ -x + 2y + 3z = 8 \\ 2x + 6y + z = -8 \end{cases}$ 9. _____

10. $\begin{cases} 5x + 6y - 2z = 29 \\ -3x + 4y + z = -13 \\ 2x - 2y + 3z = -2 \end{cases}$ 10. _____

11. $\begin{cases} 2x - 3y - 2z = 0 \\ x + 3y + z = 5 \\ x - 2y + 3z = -9 \end{cases}$ 11. _____

For Exercises 12–14, solve the system of equations using the echelon method.

12. $\begin{cases} 2x + 5y = 1 \\ 3x + 4y = 5 \end{cases}$ 12. _____

13. $\begin{cases} 7x + 5y = 2 \\ 5x + 7y = -2 \end{cases}$ 13. _____

14. $\begin{cases} -x + 2y + 2z = 0 \\ 3x + y - 6z = 7 \\ x + y + 2z = -1 \end{cases}$ 14. _____

For Exercises 15–17, solve the system of equations using Cramer's Rule.

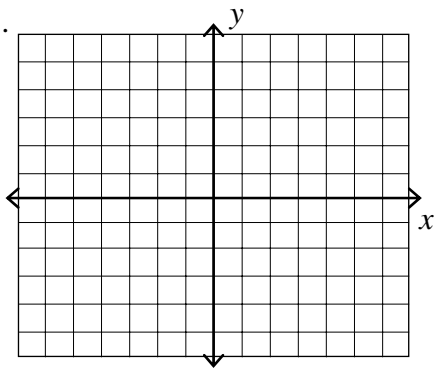
15. $\begin{cases} 3x + 8y = 13 \\ 2x - 3y = 17 \end{cases}$ 15. _____

16. $\begin{cases} 6x - 5y = 18 \\ 4x + 11y = -31 \end{cases}$ 16. _____

17. $\begin{cases} x+2y+z=5 \\ 2x+y-2z=-3 \\ 4x+3y-z=0 \end{cases}$ 17. _____

For Exercise 18, graph the solution set for the system of inequalities.

18. $\begin{cases} -2x+y>-3 \\ -2x+y<1 \end{cases}$ 18.



For Exercises 19–25, solve.

19. The sum of two numbers is 37. Find the numbers if one number is 1 greater than twice the other. 19. _____

20. The perimeter of a rectangle is 96 feet. The length is 6 feet less than twice the width. What are its dimensions? 20. _____

21. A plane can travel 540 mph with the wind and 490 mph against the wind. Find the rate of the plane in still air. 21. _____

22. Jan wishes to mix 30 pounds of coffee to sell for a total cost of $100. To obtain the mixture, she will mix coffee that sells for $3 per pound with coffee that sells for $5 per pound. How many pounds of each type of coffee should she use? 22. _____

23. Solution A is 80% alcohol. Solution B is 50% alcohol. How many ounces of each would be needed to obtain 100 ounces of a mixture that is 75% alcohol? 23. _____

24. The sum of the three digits on a license plate is 12. The sum of the first two digits is 7 and the sum of the last two digits is 8. Find the number on the license plate.

24. _____

25. An auditorium holds at most 530 people. The drama club needs to make at least $5870 on their first play. Student tickets are $9 and adult tickets are $14.

    a) Write a system of inequalities to describe the situation.
    b) Solve the system of inequalities.

25. a) _____

    b) _____

Chapter 9, Form C

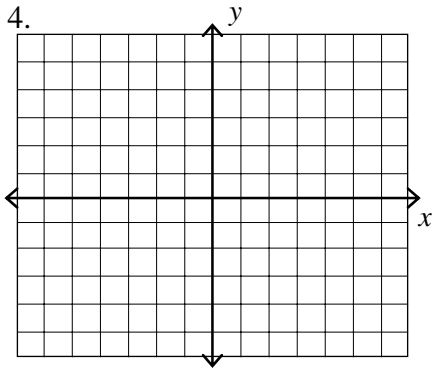
For Exercises 1–3, determine whether the given ordered pair or triple is a solution to the given system of equations.

1. $(2, -4)$; $\begin{cases} 2x - y = 8 \\ 3x + 2y = 18 \end{cases}$ 1. _____

2. $(2, -3)$; $\begin{cases} 5x + 3y = 1 \\ -3x - 4y = 6 \end{cases}$ 2. _____

3. $(-3, 0, 4)$; $\begin{cases} 2x + y + z = -2 \\ 3x - 5y + 4z = 7 \\ 2x - y + 3z = 6 \end{cases}$ 3. _____

4. Solve $\begin{cases} x - 2y = 4 \\ 2x + y = 3 \end{cases}$ by graphing. 4.



For Exercises 5–11, solve the system of equations using substitution or elimination. Note that some systems may be inconsistent or consistent with dependent equations.

5. $\begin{cases} x - 3y = 5 \\ y = \frac{2}{3}x \end{cases}$ 5. _____

6. $\begin{cases} 5x - 2y = 4 \\ 2x + 3y = 13 \end{cases}$ 6. _____

7. $\begin{cases} 2x - 5y = 10 \\ 3x + y = 15 \end{cases}$ 7. _____

8. $\begin{cases} 7x+2y=3 \\ -14x-4y=-6 \end{cases}$ 8. _____

9. $\begin{cases} x+y+z=4 \\ x-2y-z=1 \\ 2x-y-2z=-1 \end{cases}$ 9. _____

10. $\begin{cases} x+8y-6z=-47 \\ 3x-2y+7z=13 \\ 7x-9y-9z=-3 \end{cases}$ 10. _____

11. $\begin{cases} -3x-y=-6 \\ x-2y+z=0 \\ y-2z=-7 \end{cases}$ 11. _____

For Exercises 12–14, solve the system of equations using the echelon method.

12. $\begin{cases} 2x+3y=10 \\ -3x+2y=11 \end{cases}$ 12. _____

13. $\begin{cases} 3x+4y=-7 \\ 2x-y=10 \end{cases}$ 13. _____

14. $\begin{cases} -2x+3y-2z=-12 \\ 2x-5y-2z=-4 \\ 7x+2y-5z=-6 \end{cases}$ 14. _____

For Exercises 15–17, solve the system of equations using Cramer's Rule.

15. $\begin{cases} 2x+5y=1 \\ 3x+4y=5 \end{cases}$ 15. _____

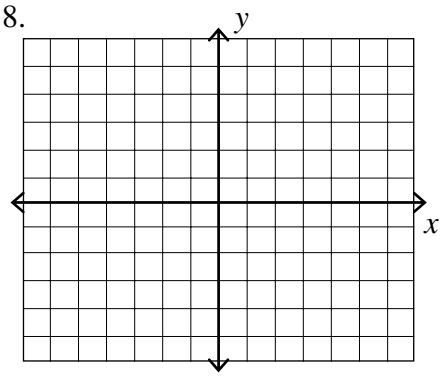
16. $\begin{cases} 5x-6y=9 \\ -4x+3y=0 \end{cases}$ 16. _____

17. $\begin{cases} x+2y-z=-4 \\ 2x-3y+5z=27 \\ 5x-y+4z=27 \end{cases}$ 17. _____

For Exercise 18, graph the solution set for the system of inequalities.

18. $\begin{cases} x - y \geq -3 \\ 2x + y \leq 4 \end{cases}$

18.



For Exercises 19–25, solve.

19. The perimeter of a rectangle is 50 feet. The length is 11 feet more than the width. What are the dimensions of the rectangle?

19. _____

20. A triangle has a perimeter of 69 inches. The second side is 7 inches longer than the first side. The third side is 6 inches shorter than twice the length of the first side. Find the length of each side.

20. _____

21. Solution A is 35% alcohol. Solution B is 60% alcohol. How many liters of each would be needed to obtain 10 liters of a mixture that is 40% alcohol?

21. _____

22. Kelli has 26 coins consisting of nickels and dimes. If the value of the coins is \$2.15, how many of each type does she have?

22. _____

23. Bob invested \$6100 in two funds paying 7% and 6% simple interest. The combined interest for both funds was \$405. How much was invested at each rate?

23. _____

24. Michelle collected \$184 selling Girl Scout cookies. The money consisted of \$1, \$5, and \$10 bills. There were three times as many \$1 bills as \$5. If there were 60 bills, how many of each bill did she have?

24. _____

25. The manager of an art store wants to purchase at least 25 prints for the store. The artist will sell him small prints for $20 and large prints for $30. The manager cannot spend more than $1500 for the prints.

    a) Write a system of inequalities to describe the situation.
    b) Solve the system of inequalities.

25. a)_____

    b)_____

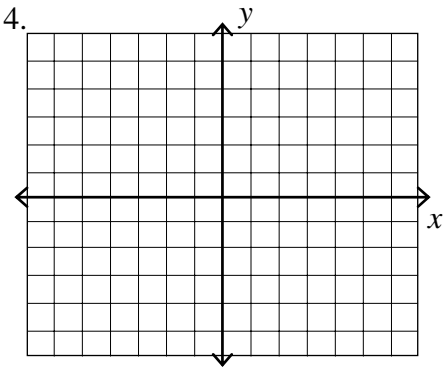
For Exercises 1–3, determine whether the given ordered pair or triple is a solution to the given system of equations.

1. $(3, -6)$; $\begin{cases} 2x + y = 0 \\ 5x + 3y = 2 \end{cases}$ 1. _____

2. $(-2, 3)$; $\begin{cases} 2x + 3y = 5 \\ 3x + 4y = 0 \end{cases}$ 2. _____

3. $(2, -1, 3)$; $\begin{cases} 3x + y - z = 2 \\ x + y - 2z = -5 \\ 2x - y + 3z = 14 \end{cases}$ 3. _____

4. Solve $\begin{cases} -x + y = 0 \\ 3x + 4y = 0 \end{cases}$ by graphing. 4.



For Exercises 5–11, solve the system of equations using substitution or elimination. Note that some systems may be inconsistent or consistent with dependent equations.

5. $\begin{cases} 2x + 8y = 4 \\ 3y = -x + 7 \end{cases}$ 5. _____

6. $\begin{cases} 3x - y = 9 \\ -x + 2y = 2 \end{cases}$ 6. _____

7. $\begin{cases} 3x - y = 2 \\ -6x + 2y = 2 \end{cases}$ 7. _____

8. $\begin{cases} 2x+4y=-12 \\ 3x+5y=-14 \end{cases}$ 8. _____

9. $\begin{cases} 2x-4y+3z=-15 \\ x-3y+2z=-11 \\ 3x-5y-4z=5 \end{cases}$ 9. _____

10. $\begin{cases} 2x-y-z=7 \\ 4x-2y-2z=5 \\ -4x+2y+2z=6 \end{cases}$ 10. _____

11. $\begin{cases} 2x+3y=2 \\ 4x+3y+z=2 \\ -2x+6y+z=0 \end{cases}$ 11. _____

For Exercises 12–14, solve the system of equations using the echelon method.

12. $\begin{cases} 5x+3y=-1 \\ 2x-4y=-16 \end{cases}$ 12. _____

13. $\begin{cases} 2x+5y=5 \\ -4x-8y=-12 \end{cases}$ 13. _____

14. $\begin{cases} 2x-y+z=-3 \\ 3x-y-z=4 \\ x+y-z=6 \end{cases}$ 14. _____

For Exercises 15–17, solve the system of equations using Cramer's Rule.

15. $\begin{cases} 3x-3y=-1 \\ 5x-2y=-4 \end{cases}$ 15. _____

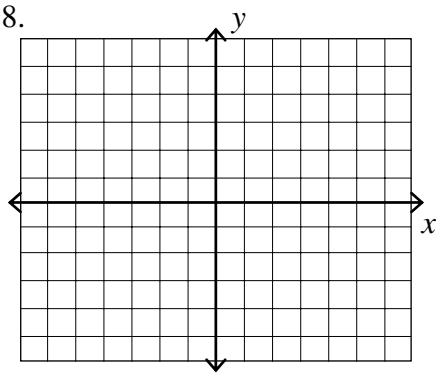
16. $\begin{cases} 10x+2y=6 \\ 5x+y=3 \end{cases}$ 16. _____

17. $\begin{cases} x+y-z=0 \\ x-3y=0 \\ 2x+2y+z=6 \end{cases}$ 17. _____

For Exercise 18, graph the solution set for the system of inequalities.

18. $\begin{cases} x + 2y > 2 \\ 3x + y \le 6 \end{cases}$

18.



For Exercises 19–25, solve.

19. Susan has 85 coins consisting of quarters and dimes. If the value of the coins is \$12.25, how many of each type does she have?

19. _____

20. The perimeter of a garden is 434 feet. The length is two and a half times the width. What are the dimensions of the garden?

20. _____

21. A twenty pound mixture of two types of candy sells for \$30.52. One type of candy sells for \$1.35 a pound and the other sells for \$1.79 per pound. How much of the cheaper candy is in the mixture?

21. _____

22. Flying with the wind a small plane flew 375 miles in 3 hours. Flying against the wind, the plane only flew 285 miles in the same amount of time. Find the rate of the plane.

22. _____

23. Bill invested \$8000 in two funds paying 8% and 10% simple interest. The combined interest for both funds was \$750. How much was invested at each rate?

23. _____

24. A company sells three types of products for \$5, \$10, and \$20 per unit. At the end of the first year, the total revenue for the three products was \$881,000, which corresponded to the sale of 136,700 units. The company sold half as many units of the \$20 product as units of the \$10 product. How many units of each product were sold?

24. _____

25. A company wants to maximize its profit for two of its products. Product A yields a profit of $1.50 per unit, and product B yields a profit of $2.00 per unit. Market tests indicate that the combined production level should not exceed 1200 units per month, the demand of product B is no more than half the demand for product A, and the production level of product A is less than or equal to 600 units plus three times the production level of product B.

a) Write a system of inequalities to describe the situation.

b) Solve the system of inequalities.

25. a)_____

b)_____

Chapter 9, Form E

1. Which ordered pair [(–1, 1), (1, –1), (1, 1), or (2, 0)] is a solution of the following system? 1. _____

$$\begin{cases} 2x + y = 3 \\ x + y = 2 \end{cases}$$

(a) (–1, 1) (b) (1, –1) (c) (1, 1) (d) (2, 0)

2. Which ordered pair [(–2, –1), (–2, 1), (1, –2), or (1, 2)] is a solution of the following system? 2. _____

$$\begin{cases} 2x + y = 0 \\ 3x - 2y = 7 \end{cases}$$

(a) (–2, –1) (b) (–2, 1) (c) (1, –2) (d) (1, 2)

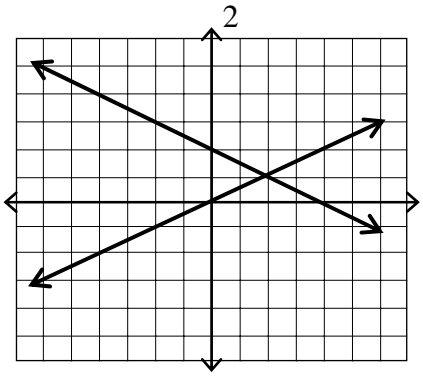
3. Which ordered triple [(–3, 0, 4), (0, –3, 1), (1, –1, 6), or (2, –15, –1)] is a solution of the following system? 3. _____

$$\begin{cases} x - 2y + 3z = 9 \\ 2x + y - 4z = -7 \\ -3x + 4y - z = -13 \end{cases}$$

(a) (–3, 0, 4), (b) (0, –3, 1) (c) (1, –1, 6), (d) (2, –15, –1)

4. For the system of equations shown, the solution is: 4. _____

$$\begin{cases} y = \frac{1}{2}x \\ y = 2 - \frac{1}{2}x \end{cases}$$



(a) (–2, –1) (b) (1, 2) (c) (2, 1) (d) (4, 0)

For Exercises 5–11, solve the system of equations using substitution or elimination. Note that some systems may be inconsistent or consistent with dependent equations.

5. $\begin{cases} x - y = -7 \\ 2x + 3y = 6 \end{cases}$ 5. _____

(a) (–3, –4) (b) (–3, 4) (c) (3, –4) (d) (3, 4)

6. $\begin{cases} x - 2y = -13 \\ 3x + 11y = -5 \end{cases}$ 6. _____

(a) (9, –2) (b) (–3, 5) (c) (2, –1) (d) (–9, 2)

7. $\begin{cases} 2x + 5y = -3 \\ 4x + y = 3 \end{cases}$ 7. _____

(a) (–1, –1) (b) (–1, 1) (c) (1, –1) (d) (1, 1)

8. $\begin{cases} 4x + 4y = 4 \\ x + y = 2 \end{cases}$ 8. _____

(a) (1, 1) (b) (–1, 1) (c) dependent (d) no solution

9. $\begin{cases} 2x - y - 3z = 6 \\ 3x + y + 2z = 5 \\ 6x + y + 4z = 9 \end{cases}$ 9. _____

(a) (–1, –1, 2) (b) (2, 1, –1) (c) (4, –2, 0) (d) (6, –20, –17)

10. $\begin{cases} x - y + z = 2 \\ 2x + 3y + z = 7 \\ 3x + 2y + 2z = -8 \end{cases}$ 10. _____

(a) (1, 0, 1) (b) (1, 2, 3) (c) (6, 4, 4) (d) no solution

11. $\begin{cases} 2x - y - 3z = 6 \\ 6x + y + 4z = 9 \\ 3x + y + 2z = 5 \end{cases}$ 11. _____

(a) (–2, –1, 1) (b) (1, 1, 2) (c) (2, 1, –1) (d) no solution

For Exercises 12–14, solve the system of equations using the echelon method.

12. $\begin{cases} 5x - 4y = 22 \\ 2x - 3y = 13 \end{cases}$ 12. _____

(a) (–3, 2) (b) (2, –3) (c) (–2, –3) (d) (2, 3)

13. $\begin{cases} 3x - 2y = -1 \\ 2x - 3y = -4 \end{cases}$ 13. _____

(a) (–1, –2) (b) (1, –2) (c) (–1, 2) (d) (1, 2)

14. $\begin{cases} 3x - 4y + z = -5 \\ x + y - z = -1 \\ x + 3y - 3z = 3 \end{cases}$ 14. _____

(a) (–3, –2, –4) (b) (–3, 2, 4) (c) (3, –2, –4) (d) (3, –2, 4)

For Exercises 15–17, solve the system of equations using Cramer's Rule.

15. $\begin{cases} 3x - 5y = 23 \\ 2x + 7y = 5 \end{cases}$ 15. _____

(a) (–6, –1) (b) (–6, 1) (c) (6, 1) (d) (6, –1)

16. $\begin{cases} 3x - 18y = 39 \\ x - 6y = 13 \end{cases}$ 16. _____

(a) (13, 0) (b) (0, –7) (c) dependent (d) no solution

17. $\begin{cases} 3x + 2y - z = 3 \\ 2x - y + z = -2 \\ x + 2y - z = -1 \end{cases}$ 17. _____

(a) (–2, 9, –15) (c) (2, –9, –15)

(b) (–2, –9, 15) (d) (2, 9, –15)

For Exercise 18, graph the solution set for the system of inequalities.

18. Describe the graph of the solution set of the following system of inequalities. 18. _____

$$\begin{cases} -x + y < -2 \\ -x + y > 3 \end{cases}$$

(a) no graph because there is no solution

(b) the region above the line $-x + y = 3$

(c) the region below the line $-x + y = -2$

(d) the region between the lines $-x + y = -2$ and $-x + y = 3$

For Exercises 19–25, solve.

19. The snack bar sells fruit by the piece. An order of four apples and three pears cost \$3.10. An order of six apples and 1 pear cost \$2.90. What is the cost of a pear? 19. _____

(a) \$0.40

(b) \$0.50

(c) \$0.55

(d) \$0.60

20. There were 640 fans at the tennis match between Joey and Ross. If there were 100 more fans for Ross than Joey, how many fans were for Joey? 20. _____

(a) 135 fans for Joey

(b) 270 fans for Joey

(c) 370 fans for Joey

(d) 520 fans for Joey

21. A solution that is 10% alcohol is mixed with a solution that is 5% alcohol to obtain 20 liters of an 8% alcohol solution. How much of the 5% solution is used? 21. _____

(a) 8 liters (b) 10 liters (c) 12 liters (d) 15 liters

22. A coin bank contains dimes and quarters. The value of the coins is \$8.00. There are six times as many quarters as dimes. Find the number of dimes in the bank. 22. _____

(a) 5 dimes (b) 11 dimes (c) 15 dimes (d) 30 dimes

23. Tina invested \$45,000 in two accounts. One paid 8% interest and the other 12%. She earned \$4400 in interest. How much was invested at 8%? 23. _____

(a) \$20,000 (b) \$24,000 (c) \$25,000 (d) \$28,000

24. The sum of three positive numbers is 19. Find the second number if the third is three times the first and the second is one more than twice the first. 24.

(a) 1 (b) 7 (c) 9 (d) 13

25. Describe the graph of the solution set of the following system of inequalities. 25. _____

$$\begin{cases} x + 2y < 4 \\ -2x + y > 2 \end{cases}$$

(a) no graph because there is no solution

(b) the region above the line $-2x + y = 2$

(c) the region below the line $x + 2y = 4$

(d) the region between the lines $x + 2y = 4$ and $-2x + y = 2$

Chapter 10, Form A

For Exercises 1 and 2, evaluate the square root.

1. $\sqrt{25}$ 1. _____

2. $\sqrt{-169}$ 2. _____

For Exercises 3–12, simplify. Assume variables represent nonnegative numbers.

3. $\sqrt{45x^4y^3}$ 3. _____

4. $\sqrt[3]{24}$ 4. _____

5. $\sqrt[4]{4x^5} \cdot \sqrt[4]{12x^2}$ 5. _____

6. $-\sqrt[3]{-72x^9}$ 6. _____

7. $\dfrac{\sqrt{4}}{\sqrt{16}}$ 7. _____

8. $\dfrac{\sqrt[4]{16}}{\sqrt[4]{81}}$ 8. _____

9. $4\sqrt{6} - \sqrt{6}$ 9. _____

10. $\left(\sqrt{5} - 2\right)^2$ 10. _____

11. $y^{-\frac{2}{5}} \cdot y^{\frac{3}{5}}$ 11. _____

12. $\left(\sqrt[3]{3} - 2\right)\left(\sqrt[3]{9} + 4\right)$ 12. _____

For Exercises 13 and 14, write in exponential form.

13. $\sqrt[5]{64y^4}$ 13. _____

14. $\left(\sqrt[3]{4xy}\right)^2$ 14. _____

For Exercises 15 and 16, rationalize the denominator and simplify.

15. $\dfrac{1}{\sqrt[3]{9}}$ 15. _____

16. $\dfrac{\sqrt{2}}{\sqrt{5}+\sqrt{2}}$ 16. _____

For Exercises 17 and 18, solve the equation.

17. $\sqrt{7x-6}=6$ 17. _____

18. $\sqrt[3]{3x-5}=\sqrt[3]{2x+8}$ 18. _____

For Exercises 19 – 22, simplify and write the answer in standard form (a + bi).

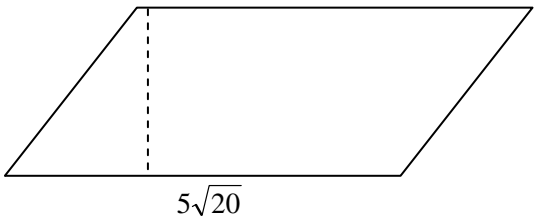
19. $(5-7i)-(4+6i)$ 19. _____

20. $(8i)(-3i)$ 20. _____

21. $(3+i)(3-i)$ 21. _____

22. $\dfrac{3}{4-2i}$ 22. _____

23. Write an expression for the area of the figure. 23. _____



24. The formula $t=\sqrt{\dfrac{d}{16}}$, describes the amount of time *t,* in seconds, that an object falls a distance of *h* feet. 24. a) _____

b) _____

a) Write an expression in simplest form for the exact amount of time an object falls a distance of 64 feet.

b) Find the distance an object falls in 9 seconds.

25. The speed of a car can be determined by the length of the skid marks using the formula $S = 2\sqrt{2L}$ where L is the length of the skid mark in feet and S is the speed of the car in miles per hour.

    a) Find the speed of the car if the skid length measures 40 feet.

    b) Find the length of the skid marks that a car traveling 60 mph would make if it breaks hard and skids to a halt.

25. a) _____

    b) _____

Chapter 10, Form B

For Exercises 1 and 2, evaluate the square root.

1. $\sqrt{-121}$ 1. _____

2. $\sqrt{64}$ 2. _____

For Exercises 3–12, simplify. Assume variables represent nonnegative numbers.

3. $\sqrt{75x^5y^6}$ 3. _____

4. $\sqrt[3]{96}$ 4. _____

5. $\sqrt[4]{3y^2}\cdot\sqrt[4]{27y^5}$ 5. _____

6. $-\sqrt[3]{-125r^9}$ 6. _____

7. $\dfrac{\sqrt{9}}{\sqrt{81}}$ 7. _____

8. $\dfrac{\sqrt[5]{1}}{\sqrt[5]{32}}$ 8. _____

9. $4\sqrt{7}+5\sqrt{7}$ 9. _____

10. $\left(\sqrt{6}-3\right)^2$ 10. _____

11. $y^{\frac{3}{4}}\cdot y^{-\frac{1}{4}}$ 11. _____

12. $\left(\sqrt[4]{3}-5\right)\left(\sqrt[4]{27}+2\right)$ 12. _____

For Exercises 13 and 14, write in exponential form.

13. $\sqrt[3]{5y^2}$ 13. _____

14. $\left(\sqrt[5]{4x^2y}\right)^2$ 14. _____

For Exercises 15 and 16, rationalize the denominator and simplify.

15. $\dfrac{3}{\sqrt[3]{4}}$ 15. _____

16. $\dfrac{\sqrt{5}}{\sqrt{5}-\sqrt{3}}$ 16. _____

For Exercises 17 and 18, solve the equation.

17. $\sqrt{x+1}=4$ 17. _____

18. $\sqrt[3]{4x+7}=\sqrt[3]{3x-5}$ 18. _____

For Exercises 19 – 22, simplify and write the answer in standard form (a + bi).

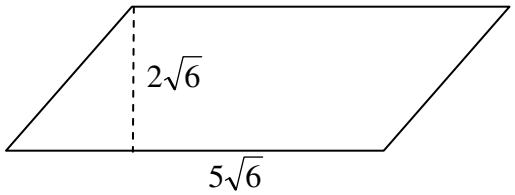
19. $(7-6i)-(4+2i)$ 19. _____

20. $(4i)(-9i)$ 20. _____

21. $(5+2i)(3-4i)$ 21. _____

22. $\dfrac{5}{3-2i}$ 22. _____

23. Write an expression for the area of the figure. 23. _____



24. The velocity of a falling object is given by the formula $v = \sqrt{2gh}$ when v is the velocity measured in feet per second, $g = 32$ feet per second squared, and h is the distance in feet that the object has fallen. If a rock is dropped from a height of 80 feet, find the velocity when the rock hits the ground. Round to the nearest tenth. 24. _____

25. The time t, in seconds, for an object to fall d feet is described by the formula $t = \sqrt{\frac{d}{16}}$. If an object is dropped from a building and hits the ground after 4 seconds, from what height was the object dropped?

25. _____

Chapter 10, Form C

For Exercises 1 and 2, evaluate the square root.

1. $\sqrt{-100}$ 1. _____

2. $\sqrt{121}$ 2. _____

For Exercises 3–12, simplify. Assume variables represent nonnegative numbers.

3. $\sqrt{144a^4b^5}$ 3. _____

4. $\sqrt[4]{96}$ 4. _____

5. $\sqrt[5]{27a^6b^3}\cdot\sqrt[5]{9a^4b^2}$ 5. _____

6. $-\sqrt[3]{-125x^{12}y^6}$ 6. _____

7. $\dfrac{\sqrt{16}}{\sqrt{81}}$ 7. _____

8. $\dfrac{\sqrt[3]{81}}{\sqrt[3]{64}}$ 8. _____

9. $7\sqrt{5}+4\sqrt{5}$ 9. _____

10. $\left(\sqrt{15}-1\right)^2$ 10. _____

11. $x^{\frac{1}{3}}\cdot x^{\frac{5}{4}}$ 11. _____

12. $\left(\sqrt[3]{4}-5\right)\left(\sqrt[3]{16}+2\right)$ 12. _____

For Exercises 13 and 14, write in exponential form.

13. $\sqrt[3]{7x^2y}$ 13. _____

14. $\left(\sqrt[5]{3x^4y^2}\right)^3$ 14. _____

For Exercises 15 and 16, rationalize the denominator and simplify.

15. $\dfrac{3}{\sqrt[3]{2}}$ 15. _____

16. $\dfrac{\sqrt{3}}{\sqrt{3}+2}$ 16. _____

For Exercises 17 and 18, solve the equation.

17. $\sqrt{x+4}=9$ 17. _____

18. $\sqrt[3]{4x-6}=\sqrt[3]{3x+12}$ 18. _____

For Exercises 19 – 22, simplify and write the answer in standard form (a + bi).

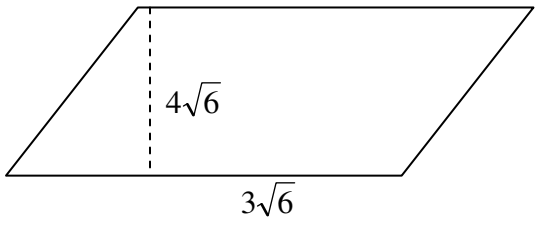
19. $(9+6i)-(7-i)$ 19. _____

20. $(6i)(-7i)$ 20. _____

21. $(5+4i)(2-i)$ 21. _____

22. $\dfrac{5}{2-5i}$ 22. _____

23. Write an expression for the area of the figure. 23. _____



24. The time t, in seconds, for an object to fall d feet is described by the formula $t=\sqrt{\dfrac{d}{16}}$. If an object is dropped from a building and hits the ground after 4 seconds, from what height was the object dropped? 24. _____

25. The velocity of a falling object is given by the formula $v = \sqrt{2gh}$ when v is the velocity measured in feet per second, $g = 16$ feet per second squared, and h is the distance in feet that the object has fallen. If a rock is dropped from a height of 800 feet, find the velocity when the rock hits the ground.

25. _____

For Exercises 1 and 2, evaluate the square root.

1. $\sqrt{0.36}$ 1. _____

2. $-\sqrt{\frac{169}{144}}$ 2. _____

For Exercises 3–12, simplify. Assume variables represent nonnegative numbers.

3. $\sqrt{75a^5b^5c^3}$ 3. _____

4. $\sqrt[3]{\frac{125}{64}}$ 4. _____

5. $\sqrt[5]{9x^3y^6}\cdot\sqrt[5]{27x^2y^4}$ 5. _____

6. $\sqrt{288x^6y^3}$ 6. _____

7. $\frac{\sqrt{40}}{\sqrt{5}}$ 7. _____

8. $\frac{\sqrt[4]{256}}{\sqrt[4]{81}}$ 8. _____

9. $5\sqrt{6}-7\sqrt{6}$ 9. _____

10. $\left(4\sqrt{3}-2\sqrt{2}\right)^2$ 10. _____

11. $\left(8x^2y^3\right)^{\frac{2}{3}}$ 11. _____

12. $\left(\sqrt{2}+\sqrt{3}\right)\left(\sqrt{5}-\sqrt{3}\right)$ 12. _____

For Exercises 13 and 14, write in exponential form.

13. $\left(\sqrt[4]{9x^3y}\right)^3$ 13. _____

14. $\sqrt[5]{(2a+3b)^3}$ 14. _____

For Exercises 15 and 16, rationalize the denominator and simplify.

15. $\dfrac{\sqrt[3]{4}}{\sqrt[3]{2}}$ 15. _____

16. $\dfrac{4\sqrt{3}}{\sqrt{6}-2\sqrt{3}}$ 16. _____

For Exercises 17 and 18, solve the equation.

17. $\sqrt{3x-2}=2$ 17. _____

18. $\sqrt{3y+1}+7=4$ 18. _____

For Exercises 19 – 22, simplify and write the answer in standard form (a + bi).

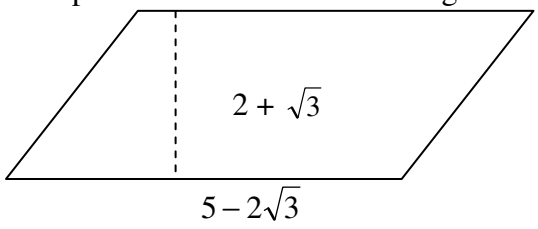
19. $(5-8i)-(2+4i)$ 19. _____

20. $(-3i)(-7i)^2$ 20. _____

21. $(6-3i)(2-5i)$ 21. _____

22. $\dfrac{6i}{6+6i}$ 22. _____

23. Write an expression for the area of the figure. 23. _____



24. The time t, in seconds, for an object to fall d feet is described by the formula $t = \sqrt{\dfrac{d}{16}}$. If an object is dropped from a building and hits the ground after 6 seconds, from what height was the object dropped? 24. _____

25. The velocity of a falling object is given by the formula $v = \sqrt{2gh}$ when v is the velocity measured in feet per second, g = 32 feet per second squared, and h is the distance in feet that the object has fallen. If a rock is dropped from a height of 100 feet, find the velocity when the rock hits the ground.

25. _____

Chapter 10, Form E

For Exercises 1 and 2, evaluate the square root if possible.

1. $\sqrt{-100}$ 1. _____

(a) -10 (b) -5 (c) 8 (d) $10i$

2. $-\sqrt{144}$ 2. _____

(a) -12 (b) 12 (c) -12 and 12 (d) 12

For Exercises 3–12, simplify. Assume variables represent nonnegative numbers.

3. $\sqrt{75x^{16}}$ 3. _____

(a) $5x^8\sqrt{15}$ (b) $5x^8\sqrt{3}$ (c) $3x^4\sqrt{5}$ (d) $15x^8$

4. $\sqrt[3]{-27}$ 4. _____

(a) -9 (b) -3 (c) 3 (d) $3i$

5. $\left(4\sqrt{3x}\right)\cdot\left(5\sqrt{7x}\right)$ 5. _____

(a) $40\sqrt{10}$ (b) $9x\sqrt{21}$ (c) $20x\sqrt{21}$ (d) $20\sqrt{7x}$

6. $\sqrt{45x^4y^4}$ 6. _____

(a) $x^2y^2\sqrt{5}$ (b) $x^2y^2\sqrt{15}$ (c) $3x^2y^2\sqrt{5}$ (d) $5x^2y^2\sqrt{8}$

7. $\sqrt[3]{\frac{5}{9}}$ 7. _____

(a) $\frac{\sqrt[3]{15}}{3}$ (b) $\frac{\sqrt[3]{5}}{15}$ (c) $\frac{\sqrt[3]{5}}{3}$ (d) $\frac{\sqrt{15}}{3}$

8. $\sqrt[3]{\frac{1}{64}}$ 8. _____

(a) $\frac{1}{64}$ (b) $\frac{1}{16}$ (c) $\frac{1}{4}$ (d) 4

9. $3\sqrt[3]{24}-8\sqrt[3]{81}+\sqrt[3]{3}$ 9. _____

(a) $-17\sqrt[3]{3}$ (b) $-5\sqrt[3]{3}$ (c) $-4\sqrt[3]{3}$ (d) $6\sqrt[3]{3}$

10. $\left(\sqrt{7}-1\right)^2$ 10. _____

(a) –7 (b) $6-2\sqrt{7}$ (c) $8-2\sqrt{7}$ (d) 6

11. $6^{\frac{4}{3}} \cdot 6^{\frac{2}{3}}$ 11. _____

(a) $6^{\frac{2}{3}}$ (b) 36^2 (c) $36^{\frac{2}{3}}$ (d) 36

12. $\left(\sqrt{7}+\sqrt{2}\right)\left(\sqrt{7}-\sqrt{2}\right)$ 12. _____

(a) 5 (b) $5-2\sqrt{14}$ (c) 9 (d) 45

For Exercises 13 and 14, rewrite in radical notation and evaluate, when possible.

13. $\left(\frac{64x^{16}}{y^9}\right)^{\frac{1}{2}}$ 13. _____

(a) $\frac{8x^8\sqrt{y}}{y^5}$ (b) $64x^8y^3$ (c) $\frac{y^3}{8x^8}$ (d) $\frac{64x^8}{y^3}$

14. $(-32)^{-\frac{2}{5}}$ 14. _____

(a) –4 (b) $-\frac{1}{4}$ (c) $\frac{1}{4}$ (d) 4

For Exercises 15 and 16, rationalize the denominator and simplify.

15. $\frac{5}{\sqrt{72}}$ 15. _____

(a) $\frac{5\sqrt{8}}{24}$ (b) $\frac{5\sqrt{72}}{72}$ (c) $\frac{5\sqrt{2}}{12}$ (d) $\frac{5\sqrt{8}}{9}$

16. $\frac{\sqrt{3}}{\sqrt{3}+2}$ 16. _____

(a) $\frac{1}{2}$ (b) $\frac{3}{5}$ (c) $-3+2\sqrt{3}$ (d) $\frac{1}{3+2\sqrt{3}}$

For Exercises 17 and 18, solve the equation.

17. $\sqrt{2x+1}=\sqrt{7x-4}$ 17. _____

(a) –1 (b) 1 (c) $\frac{3}{5}$ (d) –1, 1

18. $\sqrt{5x+34} = x+2$ 18. _____

(a) –3, 10 (b) 6 (c) –5, 6 (d) Ø

For Exercises 19 – 23, simplify and write the answer in standard form (a + bi).

19. $(6+2i)-(9-i)$ 19. _____

(a) $-15+3i$ (b) $-3+3i$ (c) $-3-i$ (d) $56+12i$

20. $(2+5i)^2$ 20. _____

(a) $29+20i$ (b) $-21+10i$ (c) $-21+20i$ (d) $29+10i$

21. $(3+2i)(3-2i)$ 21. _____

(a) –13 (b) 13 (c) $9+4i$ (d) $9-4i$

22. $\dfrac{3-2i}{2+4i}$ 22. _____

(a) $\dfrac{1}{10}-\dfrac{4}{5}i$ (b) $-\dfrac{1}{10}-\dfrac{4}{5}i$ (c) $-\dfrac{1}{10}-\dfrac{8}{5}i$ (d) $\dfrac{1}{10}+\dfrac{4}{5}i$

23. $\dfrac{10}{-1+2i}$ 23. _____

(a) $\dfrac{10}{3}+\dfrac{20}{3}i$ (b) $-1-2i$ (c) $-2-4i$ (d) $2+4i$

24. The shorter base of a trapezoid is $\sqrt{18}$ feet long and the other base is twice as long. The lengths of the nonparallel sides are $\sqrt{32}$ feet and $\sqrt{50}$ feet. Find the perimeter of the trapezoid. 24. _____

(a) $12\sqrt{6}$ feet (c) $15\sqrt{2}$ feet

(b) $12\sqrt{2}$ feet (d) $18\sqrt{2}$ feet

25. The velocity of a falling object is given by the formula $v = \sqrt{2gh}$ when v is the velocity measured in feet per second, g = 32 feet per second squared, and h is the distance in feet that the object has fallen. If a rock is dropped from a height of 144 feet, find the velocity when the rock hits the ground. 25. _____

(a) 64 feet per second (c) 96 feet per second

(b) 80 feet per second (d) 144 feet per second

Chapter 11, Form A

For Exercises 1 and 2, use the square root principle to solve and check.

1. $x^2 = 36$ 1. _____

2. $(2y + 3)^2 = 25$ 2. _____

For Exercises 3 and 4, solve by completing the square.

3. $x^2 + 8x - 3 = 0$ 3. _____

4. $5x^2 - 2x = 5$ 4. _____

For Exercises 5 and 6, solve by using the quadratic formula.

5. $x^2 - 6x + 4 = 0$ 5. _____

6. $4x^2 + x - 6 = 0$ 6. _____

For Exercises 7–12, solve using any method.

7. $y^2 - 70 = -3y$ 7. _____

8. $x^2 + 81 = 0$ 8. _____

9. $6x^2 + 6x = -1$ 9. _____

10. $4x^2 - 20x = 0$ 10. _____

11. $16p^2 - 40p + 25 = 0$ 11. _____

12. $(3x - 2)^2 = -9$ 12. _____

For Exercises 13–16, solve.

13. $\frac{1}{x}+\frac{1}{x+1}=\frac{1}{2}$ 13. _____

14. $7-8x^{-1}+x^{-2}=0$ 14. _____

15. $3\sqrt{x}+24=0$ 15. _____

16. $\sqrt{26x-39}=x+5$ 16. _____

For Exercises 17 and 18, solve using substitution.

17. $x^4+10x^2+9=0$ 17. _____

18. $2(4x-3)^2-9(4x-3)-5=0$ 18. _____

19. For $f(x) = -x^2 + 2x + 8$ 19. a) _____

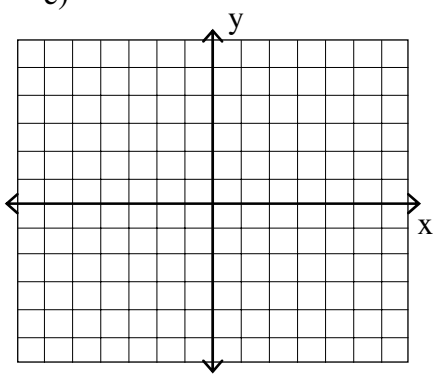
a) State whether the parabola opens upwards or downwards. b) _____

b) Find the x- and y-intercepts. c) _____

c) Find the coordinates of the vertex. d) _____

d) Write the equation of the axis of symmetry. e)

e) Graph.



For Exercises 20 and 21,

a) Solve the inequality.

b) Graph the solution set on a number line.

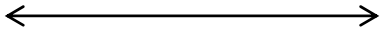
20. $(x+4)(x-1) \le 0$

20. a) _____

b) 

21. $\dfrac{x-5}{x+2} < 0$

21. a) _____

b) 

For Exercises 22–25, solve.

22. A ball is thrown downward from a two story building. The distance traveled by the ball is given by the equation $h = 16t^2 + 15t$ where t is the time traveled in seconds and h is the height of the ball. How long will it take the ball to fall 25 feet?

22. _____

23. The length of a rectangle is 2 feet less than twice the width. The area of the rectangle is 180 square feet. Find the length and width of the rectangle.

23. _____

24. A child throws a ball in a field. Suppose the equation $y = -0.25x^2 + x + 3$ models the trajectory of the ball (assume that x and y represent distances in meters and that $x \ge 0$ and $y \ge 0$).

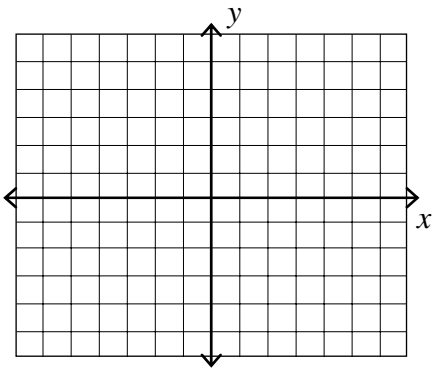
    a) What is the maximum height that the ball reaches?

    b) How far does the ball travel?

    c) Graph the trajectory.

24. a) _____

b) _____



25. A rectangular enclosure must have an area of at least 600 yd^2. If 140 yards of fencing is to be used, and the width cannot exceed the length, within what limits must the width of the enclosure be?

25. _____

Chapter 11, Form B

For Exercises 1 and 2, use the square root principle to solve and check.

1. $x^2 = 64$ 1. _____

2. $(11x - 2)^2 = 8$ 2. _____

For Exercises 3and 4, solve by completing the square.

3. $x^2 + 4x = 7$ 3. _____

4. $25x^2 + 50x = -21$ 4. _____

For Exercises5 and 6, solve by using the quadratic formula.

5. $x^2 + 8x + 12 = 0$ 5. _____

6. $7x^2 - 10x - 2 = 0$ 6. _____

For Exercises 7–12, solve using any method.

7. $3y^2 - 1 = -2y$ 7. _____

8. $(x - 3)^2 = 11$ 8. _____

9. $x^2 - 4x + 40 = 0$ 9. _____

10. $11x^2 - 22x = 0$ 10. _____

11. $x^2 + 10x + 25 = 0$ 11. _____

12. $6y^2 + 12y + 5 = 0$ 12. _____

For Exercises 13–16, solve.

13. $\frac{2}{x^2} - \frac{7}{x} = 4$ 13. _____

14. $x^{-4} - 8x^{-2} = 9$ 14. _____

15. $4\sqrt{x} + 24 = 0$ 15. _____

16. $\sqrt{18x - 45} = x + 2$ 16. _____

For Exercises 17 and 18, solve using substitution.

17. $x^4 - 29x^2 + 100 = 0$ 17. _____

18. $(4x + 5)^2 + 3(4x + 5) + 2 = 0$ 18. _____

19. For $f(x) = x^2 + 3x + 2$ 19. a) _____

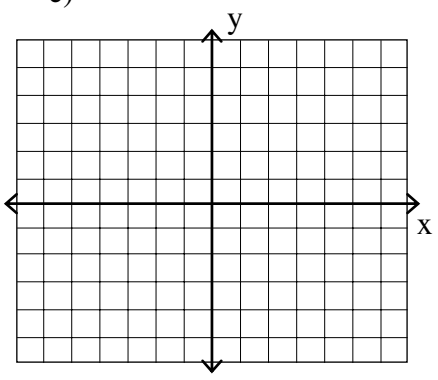
a) State whether the parabola opens upwards or downwards. b) _____

b) Find the x- and y-intercepts. c) _____

c) Find the coordinates of the vertex. d) _____

d) Write the equation of the axis of symmetry. e)

e) Graph.



For Exercises 20 and 21,

a) Solve the inequality.

b) Graph the solution set on a number line.

20. $(x+3)(x-7)>0$

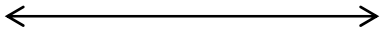
20. a) _____

b)

21. $\dfrac{x-6}{x+2}<0$

21. a) _____

b)



For Exercises 22–25, solve.

22. A ball is thrown downward from a window in a tall building. The distance traveled by the ball is given by the equation $h=16t^2+32t$ where t is the time traveled in seconds and h is the height of the ball. How long will it take the ball to fall 656 feet? Round your answer to the nearest tenth of a foot.

22. _____

23. The length of a rectangle is 2 feet greater than three times its width. Find the length and width of the rectangle if its area is 56 square feet.

23. _____

24. An arrow is shot upward with an initial velocity of 128 ft/sec. Its height h, after t seconds, is given by $h = -16t^2 + 128t$.

    a) What is the maximum height that the arrow reaches?

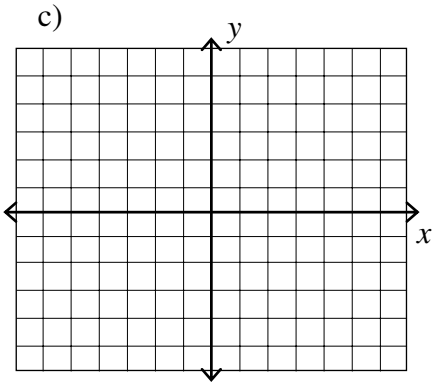
    b) At what time will the arrow hit the ground?

    c) Graph the trajectory.

24. a) _____

b) _____

c)



25. Tina has 60 yards of fencing material that she will use to make a pen for her dog Abby.

    a) What are the dimensions of the largest rectangular pen which she can enclose?

    b) What is the maximum area?

25. a) _____

b) _____

Chapter 11, Form C

For Exercises 1 and 2, use the square root principle to solve and check.

1. $x^2 = 25$ 1. _____

2. $(4x + 5)^2 = 7$ 2. _____

For Exercises 3and 4, solve by completing the square.

3. $x^2 - 12x = 13$ 3. _____

4. $2x^2 - x = 6$ 4. _____

For Exercises5 and 6, solve by using the quadratic formula.

5. $x^2 + 7x + 7 = 0$ 5. _____

6. $2x^2 - 4x + 1 = 0$ 6. _____

For Exercises 7–12, solve using any method.

7. $x^2 + 16x = -63$ 7. _____

8. $3p^2 - 10p + 8 = 0$ 8. _____

9. $2x^2 + 9x = 0$ 9. _____

10. $x^2 - 14x = 58$ 10. _____

11. $4x^2 + 16 = 0$ 11. _____

12. $4x^2 - 16x - 20 = 0$ 12. _____

For Exercises 13–16, solve.

13. $\dfrac{10}{x-3}+\dfrac{10}{x+3}=\dfrac{7}{2}$ 13. _____

14. $x^{-2}-x^{-1}=-6$ 14. _____

15. $\sqrt{x+3}=2x$ 15. _____

16. $\sqrt{16x-32}=x+2$ 16. _____

For Exercises 17 and 18, solve using substitution.

17. $x^4-13x^2+36=0$ 17. _____

18. $(x+3)^2+7(x+3)-18=0$ 18. _____

19. For $f(x)=x^2+4x-7$ 19. a) _____

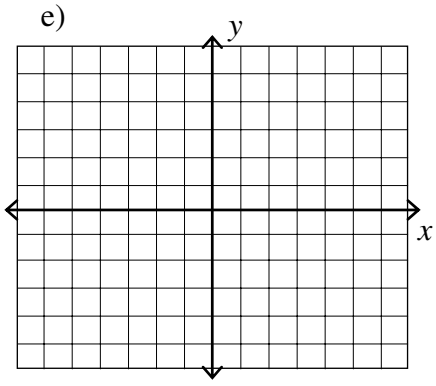
a) State whether the parabola opens upwards or downwards. b) _____

b) Find the x- and y-intercepts. c) _____

c) Find the coordinates of the vertex. d) _____

d) Write the equation of the axis of symmetry. e)

e) Graph.



For Exercises 20 and 21,

a) Solve the inequality.

b) Graph the solution set on a number line.

20. $(2x-5)(x+3) \le 0$

20. a) _____

b)

21. $\dfrac{x+5}{x-2} > 0$

21. a) _____

b)

For Exercises 22–25, solve.

22. A ball is thrown downward from a window in a tall building. The distance traveled by the ball is given by the equation $h = 16t^2$ where t is the time traveled in seconds and h is the height of the ball in feet. How long will it take the ball to fall 350 feet and hit the ground?

22. _____

23. One leg of a right triangle exceeds the shorter leg by 2 inches. If the hypotenuse is 10 inches, find the lengths of the legs.

23. _____

24. A ball is thrown vertically upward from the top of a building 112 feet tall with an initial velocity of 96 feet per second. The distance, s, in feet, of the ball from the ground after t seconds is

$s = 112 + 96t - 16t^2$.

a) What is the maximum height that the ball reaches?

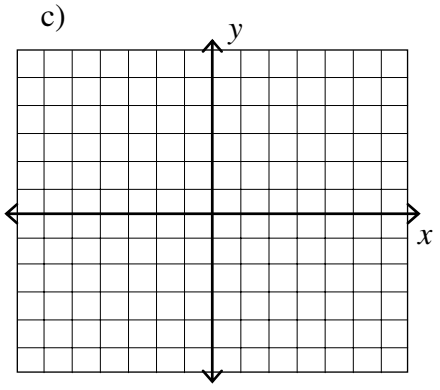
b) After how many seconds will the ball pass the top of the building on its way down?

c) Graph the trajectory.

24. a) _____

b) _____

c)



25. The SC aquarium is planning to install a new large tank for its aquarium. It is to be in the shape of a box with a height of 10 feet. It is desired that the length be 20 feet more than the width.

    a) Find the range of values for the width so that the volume of the space is at most 24,000 cubic feet.

    b) Find the range of values for the length and the width.

25. a) _____

    b) _____

Chapter 11, Form D

For Exercises 1 and 2, use the square root principle to solve and check.

1. $2x^2 = 72$ 1. _____

2. $(2x - 3)^2 = 49$ 2. _____

For Exercises 3 and 4, solve by completing the square.

3. $x^2 + 18x = -58$ 3. _____

4. $3x^2 + 15x = -18$ 4. _____

For Exercises 5 and 6, solve by using the quadratic formula.

5. $x^2 + 4x = -2$ 5. _____

6. $3x^2 - 7x = -1$ 6. _____

For Exercises 7–12, solve using any method.

7. $y^2 + 9 = -y$ 7. _____

8. $(2x + 4)^2 = 8$ 8. _____

9. $6x^2 - 29x = 5$ 9. _____

10. $5x^2 - 20x + 40 = 0$ 10. _____

11. $9x^2 - 2x + 4 = 0$ 11. _____

12. $3x^2 + 12x - 14 = 0$ 12. _____

For Exercises 13–16, solve.

13. $\dfrac{16}{x+2}-\dfrac{2}{x-4}=1$ 13. _____

14. $6x^{\frac{2}{5}}+20x^{\frac{1}{5}}+16=0$ 14. _____

15. $\sqrt{8x+12}-x-4=0$ 15. _____

16. $\sqrt{3x+10}+2x=5$ 16. _____

For Exercises 17 and 18, solve using substitution.

17. $x^4-14x^2+45=0$ 17. _____

18. $(4x-4)^2-10(4x-4)+21=0$ 18. _____

19. For $f(x) = -x^2 + 4x - 4$ 19. a) _____

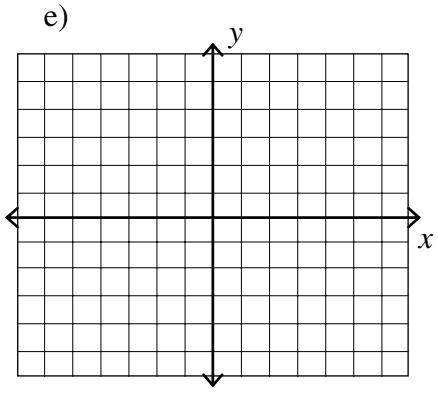
a) State whether the parabola opens upwards or downwards. b) _____

b) Find the x- and y-intercepts. c) _____

c) Find the coordinates of the vertex. d) _____

d) Write the equation of the axis of symmetry. e)

e) Graph.



For Exercises 20 and 21,

a) Solve the inequality.

b) Graph the solution set on a number line.

20. $3x^2 + 16x + 5 < 0$

20. a) _____

b) $\longleftrightarrow$

21. $\dfrac{3x+5}{6-2x} \geq 0$

21. a) _____

b) $\longleftrightarrow$

For Exercises 22–25, solve.

22. An object is dropped from an airplane. The distance traveled by the object is given by the equation $d = 16t^2$ where t is the time traveled in seconds and d is the distance that the object falls. How long will it take the object to hit the ground if it is dropped from at altitude of 35,000 feet?

22. _____

23. Two cars leave an intersection. One travels north; the other east. When the car traveling north had gone 18 miles, the distance between the cars was 6 miles more than the distance traveled by the car heading east. How far has the east bound car traveled?

23. _____

24. An acrobat is launched upwards from one end of a lever with an initial velocity of 24 feet per second. The function $h = -16t^2 + 24t$ describes the height, h, of the acrobat t seconds after being launched.

    a) What is the maximum height that the acrobat reaches?

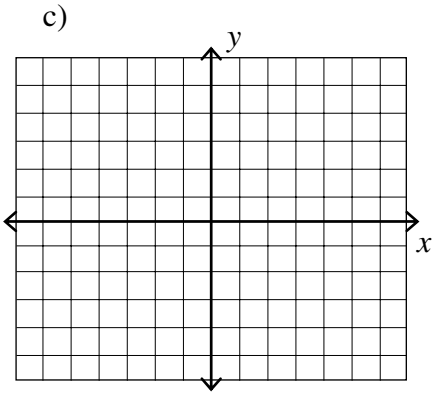
    b) How long is the acrobat in the air?

    c) Graph the trajectory.

24. a) _____

b) _____

c)



25. Cadets graduating from The Citadel usually toss their hats high into the air at the end of the ceremony. One cadet threw his hat so that the distance $d(t)$ in feet above the ground t seconds after it was thrown was $d(t) = -16t^2 + 30t + 6$.

    a) Find the distance above the ground of the hat one second after it was thrown?

    b) Find the time it takes the hat to hit the ground. Round your answer to the nearest tenth of a second.

25. a) _____

    b) _____

Chapter 11, Form E

For Exercises 1 and 2, use the square root principle to solve and check.

1. $(x+3)^2 = 6$ 1. _____

   (a) $-3 \pm \sqrt{2}$ (b) $3 \pm \sqrt{6}$ (c) $-3 \pm \sqrt{6}$ (d) $3 \pm \sqrt{2}$

2. $4x^2 = 44$ 2. _____

   (a) $\sqrt{22}$ (b) $\pm\sqrt{11}$ (c) 12 (d) ± 11

For Exercises 3 and 4, solve by completing the square.

3. $x^2 - 8x - 13 = 0$ 3. _____

   (a) $-4 \pm \sqrt{29}$ (b) $8 \pm \sqrt{77}$ (c) $4 \pm \sqrt{13}$ (d) $4 \pm \sqrt{29}$

4. $2x^2 - 8x = 5$ 4. _____

   (a) $\dfrac{-4 \pm \sqrt{26}}{2}$ (b) $\dfrac{-2 \pm \sqrt{13}}{2}$ (c) $\dfrac{2 \pm \sqrt{13}}{2}$ (d) $\dfrac{4 \pm \sqrt{26}}{2}$

For Exercises 5 and 6, solve by using the quadratic formula.

5. $x^2 + x - 3 = 0$ 5. _____

   (a) $\dfrac{-1 \pm \sqrt{13}}{2}$ (b) $\dfrac{-1 \pm \sqrt{11}}{2}$ (c) $\dfrac{1 \pm \sqrt{13}}{2}$ (d) $\dfrac{1 \pm \sqrt{11}}{2}$

6. $3x^2 + 7x + 1 = 0$ 6. _____

   (a) $\dfrac{-7 \pm \sqrt{7}}{4}$ (b) $\dfrac{-7 \pm \sqrt{37}}{6}$ (c) $\dfrac{7 \pm \sqrt{7}}{4}$ (d) $\dfrac{-7 \pm \sqrt{81}}{6}$

For Exercises 7–12, solve using any method.

7. $x^2 - 5x + 1 = 0$ 7. _____

   (a) $\dfrac{5 \pm \sqrt{21}}{2}$ (b) $\dfrac{5 \pm \sqrt{29}}{2}$ (c) $\dfrac{-5 \pm \sqrt{21}}{2}$ (d) $\dfrac{-5 \pm \sqrt{29}}{2}$

8. $7x^2 + 4x = 3$ 8. _____

(a) $-\frac{3}{7}, 1$ (b) $-\frac{3}{7}, -1$ (c) $\frac{3}{7}, 1$ (d) $\frac{3}{7}, -1$

9. $x^2 + 3x - 2 = 0$ 9. _____

(a) $\frac{-3 \pm \sqrt{17}}{2}$ (b) $\frac{3 \pm \sqrt{17}}{2}$ (c) 1, 2 (d) –2, –1

10. $x^2 - 6x + 9 = 0$ 10. _____

(a) $-3 \pm 3\sqrt{2}$ (b) $3 \pm 3\sqrt{2}$ (c) –3 (d) 3

11. $5x^2 + 4x - 12 = 0$ 11. _____

(a) $-\frac{6}{5}, 2$ (b) $-2, \frac{6}{5}$ (c) $-3, \frac{4}{5}$ (d) $-2, \frac{5}{6}$

12. $4x^2 - x + 2 = 0$ 12. _____

(a) $\frac{-1 \pm i\sqrt{33}}{8}$ (b) $\frac{-1 \pm i\sqrt{31}}{8}$ (c) $\frac{1 \pm i\sqrt{33}}{8}$ (d) $\frac{1 \pm i\sqrt{31}}{8}$

For Exercises 13–16, solve.

13. $\frac{7}{x-4} = 1 + \frac{9}{x+4}$ 13. _____

(a) –9, 10 (b) –8, 10 (c) 8, –10 (d) Ø

14. $x^3 + 2x^2 + 3x = 0$ 14. _____

(a) $-1 \pm i\sqrt{2}$ (b) $0, -1 \pm i\sqrt{2}$ (c) –3, 0, 1 (d) –3, –1, 0

15. $\sqrt{2x+15} - x = 6$ 15. _____

(a) –7, –3 (b) –7 (c) –3 (d) Ø

16. $2\sqrt{2x-2} = 2x - 1$ 16. _____

(a) $-\frac{3}{2}$ (b) $\frac{1}{2}$ (c) 1 (d) $\frac{3}{2}$

For Exercises 17 and 18, solve using substitution.

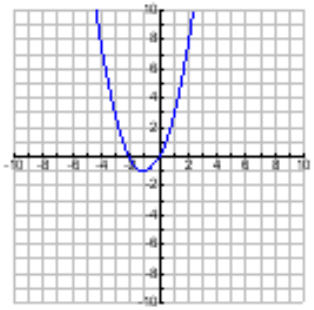
17. $6x^{\frac{2}{5}} + 9x^{\frac{1}{5}} = -3$ 17. _____

(a) $-\frac{1}{2}, -1$ (b) $\frac{1}{32}, 1$ (c) $2, 3$ (d) $-\frac{1}{32}, -1$

18. $3\left(x^2 - 1\right)^2 + 10\left(x^2 - 1\right) - 8 = 0$ 18. _____

(a) $-4, \frac{2}{3}$ (b) $-3, \frac{5}{3}$ (c) $\pm\frac{\sqrt{15}}{3}, \pm i\sqrt{3}$ (d) $\pm\frac{\sqrt{5}}{3}, \pm\sqrt{3}$

19. Find the equation of the parabola shown in the figure. 19. _____



(a) $y = -x^2 + 2x$ (c) $y = x^2 + 2x$

(b) $y = x^2 - 1$ (d) $y = x^2 + 2x + 2$

For Exercises 20 and 21, solve the inequality.

20. $x^2 + 2x \le 3$ 20. _____

(a) $(-1, 3)$ (b) $[-3, 1]$ (c) $[-1, 3]$ (d) $(-\infty, -1] \cup [3, \infty)$

21. $\frac{x-8}{x+2} < 0$ 21. _____

(a) $(2, 8)$ (c) $(-8, 2)$

(b) $(-2, 8)$ (d) $[-2, 8]$

For Exercises 22–25, solve.

22. A person standing close to the edge on top of a 288-foot building throws a baseball vertically upward. The quadratic equation $s = -16t^2 + 64t + 288$ models the ball's height above the ground, s, in feet, t seconds after it was thrown. How many seconds does it take until the ball finally hits the ground? Round your answer to the nearest tenth of a second if necessary. 22. _____

(a) 6.7 seconds (c) 2 seconds

(b) 352 seconds (d) 2.7 seconds

23. If the hypotenuse of an isosceles right triangle is 3 cm longer than either leg, find the length of the hypotenuse. 23. _____

(a) $\frac{3}{2}$ cm (c) $6 + 3\sqrt{2}$ cm

(b) $3 + 3\sqrt{2}$ cm (d) $6 - 3\sqrt{2}$ cm

24. The hypotenuse of a right triangle is 20 cm longer than the length of the longer leg. The shorter leg has a measure of 60 cm. What is the length of the longer leg? 24. _____

(a) 60 cm (b) 80 cm (c) 100 cm (d) 120 cm

25. If a rocket is propelled upward from ground level, its height h in meters after t seconds is given by $h(t) = -9.8t^2 + 88.2t$. During what interval of time will the rocket be higher than 176.4 meters? 25. _____

(a) (0, 6) (b) (6, 9) (c) (0, 3) (d) (3, 6)