

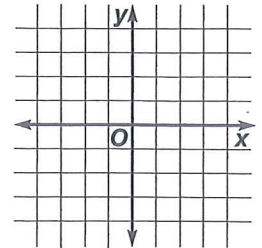
## Chapter 4 Cumulative Review (Chapters 1-4)

1. State the domain and range of the relation  $\{(-2, 5), (3, -2), (0, 5)\}$ . Then state whether the relation is a function. Write *yes* or *no*. 1. \_\_\_\_\_

2. Find  $[f \circ g](x)$  if  $f(x) = x + 5$  and  $g(x) = 3x^2$ . 2. \_\_\_\_\_

3. Graph  $y > 3|x| - 2$ .

3.



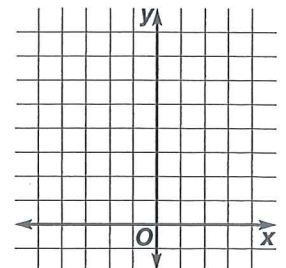
4. Solve the system of equations.  $2x + y - z = 0$   
 $x - y + z = 6$   
 $x + 2y + z = 3$  4. \_\_\_\_\_

5. ~~The coordinates of the vertices of  $\triangle ABC$  are  $A(1, -1)$ ,  $B(2, 2)$ , and  $C(3, 1)$ . Find the coordinates of the vertices of the image of  $\triangle ABC$  after a  $270^\circ$  counterclockwise rotation about the origin.~~ 5. \_\_\_\_\_

6. Gabriel works no more than 15 hours per week during the school year. He is paid \$12 per hour for tutoring math and \$9 per hour for working at the grocery store. He does not want to tutor for more than 8 hours per week. What are Gabriel's maximum earnings? 6. \_\_\_\_\_

7. Determine whether the graph of  $y = \frac{x^2}{4}$  is symmetric to the  $x$ -axis, the  $y$ -axis, the line  $y = x$ , the line  $y = -x$ , or none of these. 7. \_\_\_\_\_

8. Graph  $y = 4 - \sqrt[3]{x + 2}$  using the graph of the function  $y = x^3$ . 8.



9. Describe the end behavior of  $y = -4x^7 + 3x^3 - 5$ . 9. \_\_\_\_\_

10. Determine the slant asymptote for  $f(x) = \frac{x^2 - 3x - 2}{x + 1}$ . 10. \_\_\_\_\_

11. Solve  $\frac{-3x}{x^2 - 4x - 32} - \frac{2}{x - 8} = \frac{3}{x + 4}$ . 11. \_\_\_\_\_

12. Solve  $43x - x^3 + x^4 = 10 + 21x^2$ . 12. \_\_\_\_\_

## Unit 1 Review, Chapters 1–4

Given that  $x$  is an integer, state the relation representing each equation as a set of ordered pairs. Then, state whether the relation is a function. Write yes or no.

1.  $y = 3x + 1$  and  $-1 \leq x \leq 3$

2.  $y = |2 - x|$  and  $-2 \leq x \leq 3$

Find  $[f \circ g](x)$  and  $[g \circ f](x)$  for each  $f(x)$  and  $g(x)$ .

3.  $f(x) = 3x + 1$

$g(x) = x + 3$

4.  $f(x) = 4x^2$

$g(x) = -x^3$

5.  $f(x) = x^2 - 25$

$g(x) = 2x - 4$

Find the zero of each function.

6.  $f(x) = 4x - 10$

7.  $f(x) = 15x$

8.  $f(x) = 0.75x + 3$

Write the slope-intercept form of the equation of the line through the points with the given coordinates.

9.  $(4, -4), (6, -10)$

10.  $(1, 2), (5, 4)$

Write the standard form of the equation of each line described below.

11. parallel to  $y = 3x - 1$

passes through  $(-1, 4)$

12. perpendicular to  $2x - 3y = 6$

$x$ -intercept: 2

The table below shows the number of T-shirts sold per day during the first week of a senior-class fund-raiser.

Day	Number of Shirts Sold
1	12
2	21
3	32
4	43
5	56

13. Use the ordered pairs  $(2, 21)$  and  $(4, 43)$  to write the equation of a best-fit line.

14. Predict the number of shirts sold on the eighth day of the fund-raiser. Explain whether you think the prediction is reliable.

Graph each function.

15.  $f(x) = \lfloor x + 2 \rfloor$

16.  $f(x) = |2x| - 1$

$$17. f(x) = \begin{cases} x - 2 & \text{if } x \leq -1 \\ 2x & \text{if } -1 < x < 1 \\ -x & \text{if } x \geq 2 \end{cases}$$

Graph each inequality.

18.  $x + 3y < 12$

19.  $y \geq -\frac{2}{3}x + 5$

Solve each system of equations.

20.  $y = -4x$

$x - y = 5$

21.  $x + y = 12$

$2x - y = -4$

22.  $7x - z = 13$

$y + 3z = 18$

$11x + y = 27$

Use matrices  $A$ ,  $B$ ,  $C$ , and  $D$  to find each sum, difference, or product.

$$A = \begin{bmatrix} 6 & 2 \\ 3 & -3 \end{bmatrix} \quad B = \begin{bmatrix} -4 & 6 \\ 5 & 7 \end{bmatrix} \quad C = \begin{bmatrix} 3 & 2 & -1 \\ -5 & -8 & 1 \end{bmatrix}$$

$$D = \begin{bmatrix} 2 & 0 \\ 6 & -3 \\ -5 & -1 \end{bmatrix} \quad E = \begin{bmatrix} -3 & 1 & 5 \\ -1 & -4 & -2 \\ 3 & 2 & -1 \end{bmatrix}$$

23.  $A + B$

24.  $2A - B$

25.  $CD$

26.  $AB + CD$

Use matrices  $A$ ,  $B$ , and  $E$  above to find the following.

27. Evaluate the determinant of matrix  $A$ .

28. Evaluate the determinant of matrix  $E$ .

29. Find the inverse of matrix  $B$ .

Solve each system of inequalities by graphing. Name the coordinates of the vertices of each polygonal convex set. Then, find the maximum and minimum values for the function  $f(x, y) = 2y - 2x - 3$ .

30.  $x \geq 0$

31.  $x \geq 2$

$y \geq 0$

$y \geq -3$

$2y + x \leq 1$

$y \leq 5 - x$

$y + 2x \leq 8$

Unit 1 Review, Chapters 1–4 (continued)

Determine whether each function is an even function, an odd function, or neither.

32.  $y = -3x^3$

33.  $y = 2x^4 - 5$

34.  $y = x^3 + 3x^2 - 6x - 8$

Use the graph of  $f(x) = x^3$  to sketch a graph for each function. Then, describe the transformations that have taken place in the related graphs.

35.  $y = -f(x)$

36.  $y = f(x - 2)$

Graph each inequality.

37.  $y \leq |x + 3|$

38.  $y > \sqrt[3]{x + 4}$

Find the inverse of each function. Sketch the function and its inverse. Is the inverse a function? Write yes or no.

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

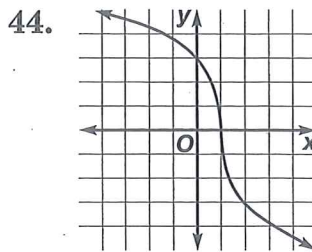
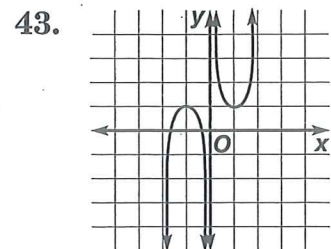
40.  $y = (x - 1)^3 + 2$

Determine whether each graph has infinite discontinuity, jump discontinuity, point discontinuity, or is continuous. Then, graph each function.

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

42.  $y = \begin{cases} x - 1 & \text{if } x < 0 \\ x - 3 & \text{if } x \geq 0 \end{cases}$

Find the critical points for the functions graphed in Exercises 43 and 44. Then, determine whether each point is a maximum, a minimum, or a point of inflection.



Determine any horizontal, vertical, or slant asymptotes or point discontinuity in the graph of each function. Then, graph each function.

45.  $y = \frac{x}{(2x + 1)(x + 2)}$

46.  $y = \frac{x^2 - 9}{x + 3}$

Solve each equation or inequality.

47.  $x^2 - 8x + 16 = 0$

48.  $4x^2 - 4x - 10 = 0$

49.  $\frac{x + 2}{4} + \frac{x - 3}{4} = 6$

50.  $2x + \frac{1}{2 - x} > \frac{1}{2}; x \neq 2$

51.  $9 + \sqrt{x - 1} = 1$

52.  $\sqrt{x + 8} - \sqrt{x + 35} \leq -3$

Use the Remainder Theorem to find the remainder for each division.

53.  $(x^2 - x + 4) \div (x - 6)$

54.  $(2x^3 - 3x + 1) \div (x - 2)$

~~Find the number of possible positive real zeros and the number of possible negative real zeros. Determine all of the rational zeros.~~

~~55.  $f(x) = 3x^2 + x - 2$~~

~~56.  $f(x) = x^4 + x^3 - 2x^2 + 3x - 1$~~

Approximate the real zeros of each function to the nearest tenth.

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

58.  $f(x) = x^3 + 4x^2 + x - 2$

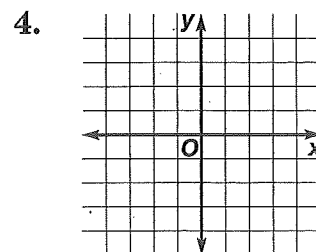
## Unit 1 Test, Chapters 1-4

1. Find the maximum and minimum values of  $f(x, y) = 3x + y$  for the polygonal convex set determined by  $x \geq 1$ ,  $y \geq 0$ , and  $x + 0.5y \leq 2$ . 1. \_\_\_\_\_

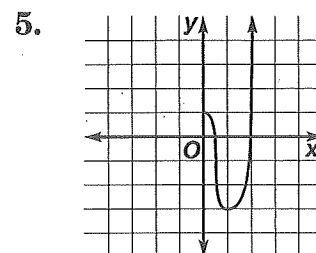
2. Write the polynomial equation of least degree that has the roots  $-3i$ ,  $3i$ ,  $i$ , and  $-i$ . 2. \_\_\_\_\_

3. Divide  $4x^3 + 3x^2 - 2x + 75$  by  $x + 3$  by using synthetic division. 3. \_\_\_\_\_

4. Solve the system of equations by graphing.  
 $3x - 5y = -8$   
 $x + 2y = 1$



5. Complete the graph so that it is the graph of an even function.



6. Solve the system of equations.  
 $x - y - z = 2$   
 $x + 2y - 2z = 3$   
 $3x - 2y - 4z = 5$

6. \_\_\_\_\_

7. Decompose the expression  $\frac{17n - 23}{4n^2 + 23n - 6}$  into partial fractions. 7. \_\_\_\_\_

8. Is the graph of  $\frac{x^2}{9} - \frac{y^2}{25} = 1$  symmetric with respect to the  $x$ -axis, the  $y$ -axis, neither axis, or both axes? 8. \_\_\_\_\_

9. Without graphing, describe the end behavior of the graph of  $f(x) = -5x^2 - 3x + 1$ . 9. \_\_\_\_\_

10. How many solutions does a consistent and dependent system of linear equations have? 10. \_\_\_\_\_

11. Solve  $3x^2 - 7x - 6 = 0$ . 11. \_\_\_\_\_

12. Solve  $3y^2 + 4y - 2 \leq 0$ . 12. \_\_\_\_\_

**Unit 1 Test, Chapters 1-4 (continued)**

13. If  $f(x) = -4x^2$  and  $g(x) = \frac{2}{x}$ , find  $[g \circ f](x)$ . **13.** \_\_\_\_\_

14. Are  $f(x) = \frac{1}{2}x + 5$  and  $g(x) = 2x - 5$  inverses of each other? **14.** \_\_\_\_\_

15. Find the inverse of  $y = \frac{x^2}{10}$ . Then, state whether the inverse is a function. **15.** \_\_\_\_\_

16. Determine if the expression  $4m^5 - 6m^8 + m + 3$  is a polynomial in one variable. If so, state the degree. **16.** \_\_\_\_\_

17. Describe how the graph of  $y = |x - 2|$  is related to its parent graph. **17.** \_\_\_\_\_

18. Write the slope-intercept form of the equation of the line that passes through the point  $(-5, 4)$  and has a slope of  $-1$ . **18.** \_\_\_\_\_

19. Determine whether the figure with vertices at  $(1, 2)$ ,  $(3, 1)$ ,  $(4, 3)$ , and  $(2, 4)$  is a parallelogram. **19.** \_\_\_\_\_

20. A plane flies with a ground speed of 160 miles per hour if there is no wind. It travels 350 miles with a head wind in the same time it takes to go 450 miles with a tail wind. Find the speed of the wind. **20.** \_\_\_\_\_

21. Solve the system of equations algebraically. **21.** \_\_\_\_\_

$$\begin{aligned} \frac{1}{3}x + \frac{1}{3}y &= 1 \\ 2x + 2y &= 9 \end{aligned}$$

22. Find the value of  $\begin{vmatrix} 5 & 3 & -2 \\ 1 & 0 & 4 \\ 4 & -1 & 2 \end{vmatrix}$  by using expansion by minors. **22.** \_\_\_\_\_

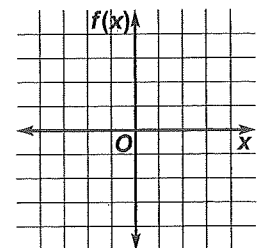
23. Solve the system of equations by using augmented matrices. **23.** \_\_\_\_\_

$$\begin{aligned} y &= 3x - 10 \\ x &= 12 - 4y \end{aligned}$$

24. Approximate the greatest real zero of the function  $g(x) = x^3 - 3x + 1$  to the nearest tenth. **24.** \_\_\_\_\_

25. Graph  $f(x) = \frac{1}{x-1}$ .

**25.**



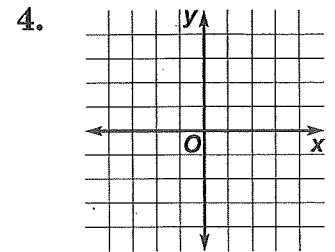
**Unit 1 Test, Chapters 1–4**

1. Find the maximum and minimum values of  $f(x, y) = 3x + y$  for the polygonal convex set determined by  $x \geq 1$ ,  $y \geq 0$ , and  $x + 0.5y \leq 2$ . **1.** \_\_\_\_\_

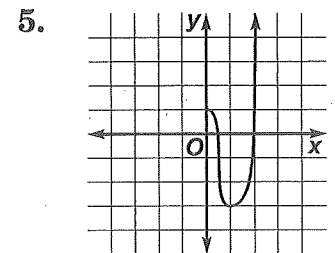
2. Write the polynomial equation of least degree that has the roots  $-3i$ ,  $3i$ ,  $i$ , and  $-i$ . **2.** \_\_\_\_\_

3. Divide  $4x^3 + 3x^2 - 2x + 75$  by  $x + 3$  by using synthetic division. **3.** \_\_\_\_\_

4. Solve the system of equations by graphing.  
 $3x - 5y = -8$   
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5. Complete the graph so that it is the graph of an even function.



6. Solve the system of equations.  
 $x - y - z = 2$   
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**6.** \_\_\_\_\_

7. Decompose the expression  $\frac{17n - 23}{4n^2 + 23n - 6}$  into partial fractions. **7.** \_\_\_\_\_

8. Is the graph of  $\frac{x^2}{9} - \frac{y^2}{25} = 1$  symmetric with respect to the  $x$ -axis, the  $y$ -axis, neither axis, or both axes? **8.** \_\_\_\_\_

9. Without graphing, describe the end behavior of the graph of  $f(x) = -5x^2 - 3x + 1$ . **9.** \_\_\_\_\_

10. How many solutions does a consistent and dependent system of linear equations have? **10.** \_\_\_\_\_

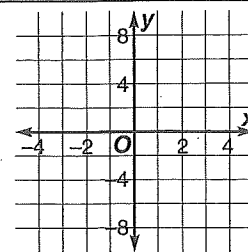
11. Solve  $3x^2 - 7x - 6 = 0$ . **11.** \_\_\_\_\_

12. Solve  $3y^2 + 4y - 2 \leq 0$ . **12.** \_\_\_\_\_

**Unit 1 Test, Chapters 1–4 (continued)**

26. Write the slope-intercept form of the equation  $6x + y + 9 = 0$ . Then, graph the equation.

26. \_\_\_\_\_



27. Write the standard form of the equation of the line that passes through  $(-3, 7)$  and is perpendicular to the line with equation  $y = 3x - 5$ .

27. \_\_\_\_\_

28. Use the Remainder Theorem to find the remainder of  $(x^3 - 5x^2 + 7x + 3) \div (x - 2)$ . State whether the binomial is a factor of the polynomial.

28. \_\_\_\_\_

29. Solve  $x - \sqrt{2x + 1} = 7$ .

29. \_\_\_\_\_

30. Determine the value of  $w$  so that the line whose equation is  $5x - 2y = -w$  passes through the point at  $(-1, 3)$ .

30. \_\_\_\_\_

31. Determine the slant asymptote for  $f(x) = \frac{x^2 - 5x - 3}{x}$ .

31. \_\_\_\_\_

32. Find the value of  $\begin{vmatrix} 3 & 5 \\ 7 & -2 \end{vmatrix}$ .

32. \_\_\_\_\_

33. State the domain and range of  $\{(-5, 2), (4, 3), (-2, 0), (-5, 1)\}$ . Then, state whether the relation is a function.

33. \_\_\_\_\_

34. Determine whether the function  $f(x) = \llbracket x + 1 \rrbracket$  is odd, even, or neither.

34. \_\_\_\_\_

35. Find the least integral upper bound of the zeros of the function  $f(x) = x^3 - x^2 + 1$ .

35. \_\_\_\_\_

36. Solve  $|2 - 3x| \leq 4$ .

36. \_\_\_\_\_

37. If  $A = \begin{bmatrix} 2 & 3 \\ 1 & 4 \end{bmatrix}$  and  $B = \begin{bmatrix} 0 & -2 \\ 1 & 5 \end{bmatrix}$ , find  $AB$ .

37. \_\_\_\_\_

38. Name all the values of  $x$  that are not in the domain of  $f(x) = \frac{2 - x^2}{x + 5}$ .

38. \_\_\_\_\_

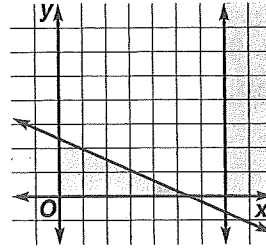
39. Given that  $x$  is an integer between  $-2$  and  $2$ , state the relation represented by the equation  $y = 2 - |x|$  by listing a set of ordered pairs. Then, state whether the relation is a function. Write *yes* or *no*.

39. \_\_\_\_\_



Unit 1 Test, Chapters 1-4 (continued)

40. Determine whether the system of inequalities graphed at the right is *infeasible*, has *alternate optimal solutions*, or is *unbounded* for the function  $f(x, y) = 2x + y$ .



40. \_\_\_\_\_

41. Solve  $1 = (y + 3)(2y - 2)$ .

41. \_\_\_\_\_

42. Determine whether the function  $y = -\frac{3}{x^2}$  has *infinite discontinuity*, *jump discontinuity*, or *point discontinuity*, or is *continuous*.

42. \_\_\_\_\_

43. Find the slope of the line passing through the points at  $(a, a + 3)$  and  $(4a, a - 5)$ .

43. \_\_\_\_\_

44. Together, two printers can print 7500 lines if the first printer prints for 2 minutes and the second prints for 1 minute. If the first printer prints for 1 minute and the second printer prints for 2 minutes, they can print 9000 lines together. Find the number of lines per minute that each printer prints.

44. \_\_\_\_\_

45. A box for shipping roofing nails must have a volume of 84 cubic feet. If the box must be 3 feet wide and its height must be 3 feet less than its length, what should the dimensions of the box be?

45. \_\_\_\_\_

46. Solve the system of equations.

$$-3x - 2y + 3z = -1$$

$$2x + 5y - 3z = -6$$

$$4x + 3y + 3z = 22$$

46. \_\_\_\_\_

47. Solve  $4x^2 + 12x - 7 = 0$  by completing the square.

47. \_\_\_\_\_

48. Find the critical point of the function  $y = -2(x - 1)^2 - 3$ . Then, determine whether the point represents a *maximum*, a *minimum*, or a *point of inflection*.

48. \_\_\_\_\_

49. Solve  $\begin{bmatrix} 1 & -3 \\ -1 & 1 \end{bmatrix} \cdot \begin{bmatrix} x \\ y \end{bmatrix} = \begin{bmatrix} -5 \\ 1 \end{bmatrix}$ .

49. \_\_\_\_\_

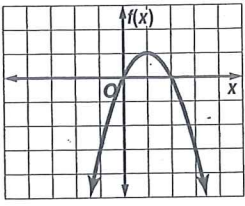
50. Write the standard form of the equation of the line that passes through  $(5, -2)$  and is parallel to the line with equation  $3x + 2y + 4 = 0$ .

50. \_\_\_\_\_



# 5 Chapter 5 Test, Form 2A

Write the letter for the correct answer in the blank at the right of each question.

- Identify the  $y$ -intercept and the axis of symmetry for the graph of  $f(x) = 10x^2 + 40x + 42$ .  
 A. 42;  $x = 4$       B. 0;  $x = -4$       C. 42;  $x = -2$       D. -42;  $x = 2$       1. \_\_\_\_\_
- Identify the quadratic function graphed at the right.  
 F.  $f(x) = -x^2 - 2x$   
 G.  $f(x) = -x^2 + 2x$   
 H.  $f(x) = x^2 - 2x$   
 J.  $f(x) = -(x + 2)^2$   
      2. \_\_\_\_\_
- Determine whether  $f(x) = 4x^2 - 16x + 6$  has a maximum or a minimum value and find that value.  
 A. minimum; -10    B. minimum; 2      C. maximum; -10    D. maximum; 2      3. \_\_\_\_\_
- ~~Solve  $-x^2 = 4x$  by graphing. If exact roots cannot be found, state the consecutive integers between which the roots are located.  
 F. 4, 0      H. -4, 0  
 G. between -4 and 4      J. -2, 4~~      4. \_\_\_\_\_
- Solve  $x^2 - 3x = 18$  by factoring.  
 A. {6}      B. {-6, 3}      C. {-9, 2}      D. {-3, 6}      5. \_\_\_\_\_
- Which quadratic equation has roots -2 and  $\frac{1}{5}$ ?  
 F.  $x^2 + 4x + 4 = 0$       H.  $5x^2 - 9x - 2 = 0$   
 G.  $5x^2 + 9x - 2 = 0$       J.  $5x^2 - 11x + 2 = 0$       6. \_\_\_\_\_
- Simplify  $(4 - 12i) - (-8 + 4i)$ .  
 A.  $12 - 8$       B. 28      C.  $12 - 16i$       D.  $12 + 16i$       7. \_\_\_\_\_
- Simplify  $\frac{4 - 2i}{7 + 3i}$ .  
 F.  $\frac{11}{29} - \frac{13i}{29}$       G.  $\frac{11}{29} - \frac{14i}{29}$       H.  $\frac{13}{29} - \frac{17i}{29}$       J.  $\frac{17}{29} - \frac{13i}{29}$       8. \_\_\_\_\_
- To solve  $9x^2 - 12x + 4 = 49$  by using the Square Root Property, you would first rewrite the equation as \_\_\_\_\_.  
 A.  $9x^2 - 12x - 45 = 0$       C.  $(3x - 2)^2 = 7$   
 B.  $(3x - 2)^2 = \pm 49$       D.  $(3x - 2)^2 = 49$       9. \_\_\_\_\_
- Find the value of  $c$  that makes  $x^2 - 9x + c$  a perfect square.  
 F.  $\frac{81}{4}$       G.  $\frac{9}{2}$       H.  $-\frac{81}{4}$       J. 81      10. \_\_\_\_\_

**5**
**Chapter 5 Test, Form 2A** *(continued)*

11. The quadratic equation  $x^2 - 8x = -20$  is to be solved by completing the square. Which equation would be a step in that solution?
- A.  $(x - 4)^2 = 4$                                   C.  $x^2 - 8x + 20 = 0$
- B.  $x - 4 = \pm 2i$                                       D.  $x^2 - 8x + 16 = -20$
11. \_\_\_\_\_

12. Find the exact solutions to  $3x^2 = 5x - 1$  by using the Quadratic Formula.
- F.  $\frac{-5 \pm \sqrt{13}}{6}$                                   G.  $\frac{5 \pm \sqrt{13}}{3}$                                   H.  $\frac{5 \pm \sqrt{37}}{6}$                                   J.  $\frac{5 \pm \sqrt{13}}{6}$
12. \_\_\_\_\_

For Questions 13 and 14, use the value of the discriminant to determine the number and type of roots for each equation.

13.  $2x^2 - 7x + 9 = 0$
- A. 2 real, rational                                  C. 2 complex
- B. 2 real, irrational                              D. 1 real, rational
13. \_\_\_\_\_

14.  $x^2 + 20 = 12x - 16$
- F. 1 real, irrational                              H. 2 real, rational
- G. no real    J. 1 real, rational
14. \_\_\_\_\_

15. Identify the vertex, axis of symmetry, and direction of opening for  $y = \frac{1}{2}(x - 8)^2 + 2$ .
- A.  $(-8, 2)$ ;  $x = -8$ ; up                      C.  $(8, -2)$ ;  $x = 8$ ; up
- B.  $(-8, -2)$ ;  $x = -8$ ; down              D.  $(8, 2)$ ;  $x = 8$ ; up
15. \_\_\_\_\_

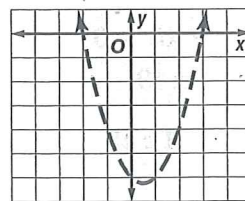
16. Which quadratic function has its vertex at  $(-2, 7)$  and opens down?
- F.  $y = -3(x + 2)^2 + 7$                       H.  $y = (x - 2)^2 + 7$
- G.  $y = -12(x + 2)^2 - 7$                       J.  $y = -2(x - 2)^2 + 7$
16. \_\_\_\_\_

17. Write  $y = x^2 + 4x - 1$  in vertex form.
- A.  $y = (x - 2)^2 + 5$                               C.  $y = (x + 2)^2 - 1$
- B.  $y = (x + 2)^2 - 5$                               D.  $y = (x + 2)^2 + 3$
17. \_\_\_\_\_

18. Write an equation for the parabola whose vertex is at  $(-8, 4)$  and passes through  $(-6, -2)$ .
- F.  $y = -\frac{3}{2}(x + 8)^2 + 4$                       H.  $y = -\frac{1}{4}(x + 8)^2 + 4$
- G.  $y = \frac{3}{2}(x + 6)^2 - 2$                               J.  $y = -\frac{3}{2}(x - 8)^2 + 4$
18. \_\_\_\_\_

19. Which quadratic inequality is graphed at the right?

- A.  $y \geq (x - 2)(x + 3)$                       C.  $y > (x + 2)(x - 3)$
- B.  $y > (x - 2)(x + 3)$                       D.  $y < (x + 2)(x - 3)$



20. Solve  $x^2 \geq 2x + 24$ .
- F.  $\{x \mid -4 \leq x \leq 6\}$                               H.  $\{x \mid -6 \leq x \leq 4\}$
- G.  $\{x \mid x \leq -6 \text{ or } x \geq 4\}$                       J.  $\{x \mid x \leq -4 \text{ or } x \geq 6\}$
20. \_\_\_\_\_

**Bonus** Write a quadratic equation with roots  $\pm \frac{i\sqrt{3}}{4}$ .                      B: \_\_\_\_\_

# Chapter 4 Answer Key

## Page 171

1. A
2. D
3. C
4. E
5. D
6. B
7. A
8. B
9. D
10. A

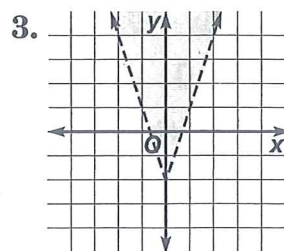
## SAT/ACT Practice Page 172

11. D
12. D
13. A
14. E
15. A
16. A
17. A
18. C
19. 6
20. 2.5

## Cumulative Review Page 173

1.  $D = \{-2, 0, 3\}$ ,  
 $R = \{-2, 5\}$ ; yes

2.  $3x^2 + 5$

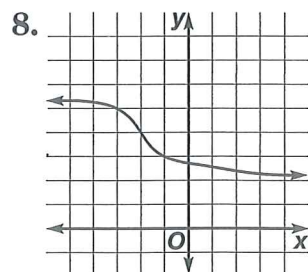


4.  $(2, -1, 3)$

5.  $A'(-1, -1), B'(2, -2),$   
 $C'(1, -3)$

6. \$159

7. y-axis



9.  $x \rightarrow \infty, y \rightarrow -\infty,$   
 $x \rightarrow -\infty, y \rightarrow \infty$

10.  $y = x - 4$

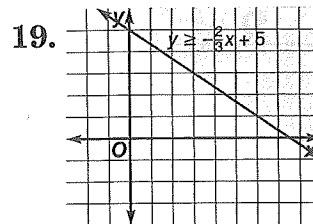
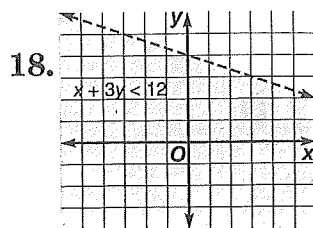
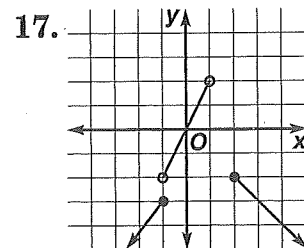
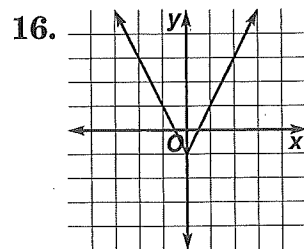
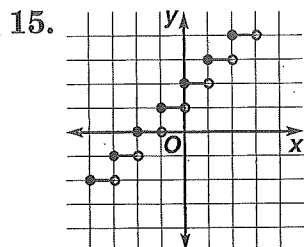
11. 2

12.  $-5, 2, 2 \pm \sqrt{3}$

# Unit 1 Answer Key

## Unit 1 Review

- $\{(-1, -2), (0, 1), (1, 4), (2, 7), (3, 10)\}$ ; yes
- $\{(-2, 4), (-1, 3), (0, 2), (1, 1), (2, 0), (3, 1)\}$ ; yes
- $3x + 10$ ;  $3x + 4$
- $4x^6$ ;  $-64x^6$
- $4x^2 - 16x - 9$ ;  $2x^2 - 54$
- $\frac{5}{2}$     7. 0    8. -4
- $y = -3x + 8$
- $y = \frac{1}{2}x + \frac{3}{2}$
- $3x - y + 7 = 0$
- $3x + 2y - 6 = 0$
- $y = 11x - 1$
- 87; No, because as the sale continues, fewer students will be left to buy T-shirts. The number of shirts sold will have to decrease eventually.



20.  $(1, -4)$     21.  $(\frac{8}{3}, \frac{28}{3})$

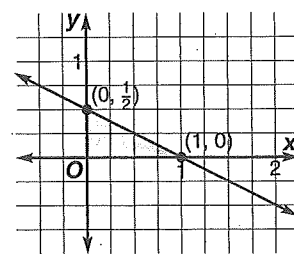
22.  $(3, -6, 8)$     23.  $\begin{bmatrix} 2 & 8 \\ 8 & 4 \end{bmatrix}$

24.  $\begin{bmatrix} 16 & -2 \\ 1 & -13 \end{bmatrix}$     25.  $\begin{bmatrix} 23 & -5 \\ -63 & 23 \end{bmatrix}$

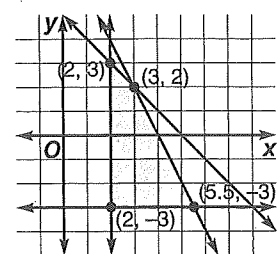
26.  $\begin{bmatrix} 9 & 45 \\ -90 & 20 \end{bmatrix}$     27. -24

28. 19    29.  $\begin{bmatrix} -7 & 3 \\ 58 & 29 \\ 5 & 2 \\ 58 & 29 \end{bmatrix}$

30.  $(0, 0), (1, 0), (0, \frac{1}{2})$ ; -2, -5

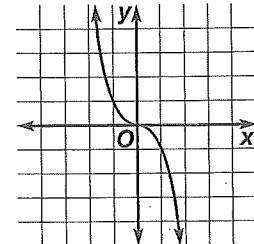


31.  $(2, -3), (5.5, -3), (3, 2), (2, 3)$ ; -1, -20

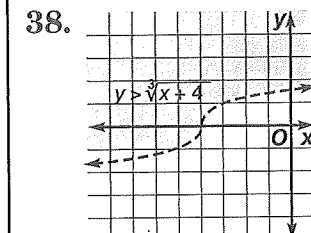
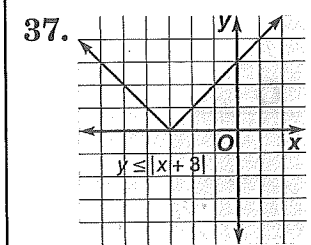
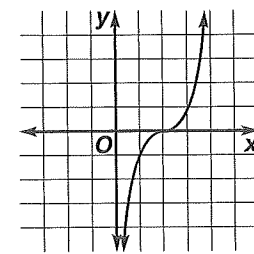


32. odd    33. even    34. neither

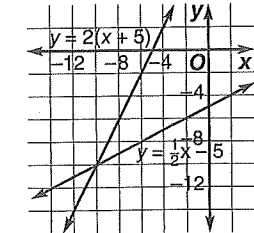
35. reflected over x-axis



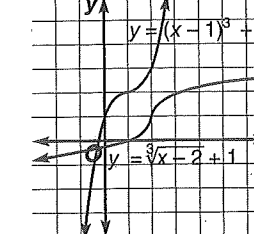
36. translated 2 units right



39.  $y = 2(x + 5)$ ; yes



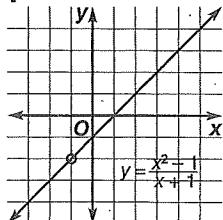
40.  $y = \sqrt[3]{x - 2} + 1$ ; yes



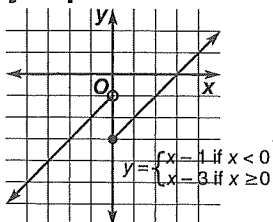


# Unit 1 Answer Key (continued)

41. point discontinuity



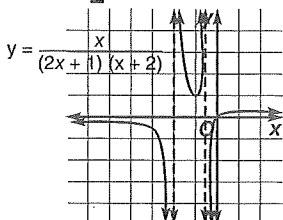
42. jump discontinuity



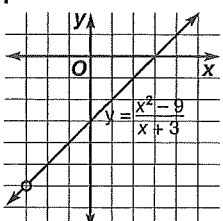
43. max.: (-1, 1); min.: (1, 1)

44. pt. of inflection: (1, 0)

45.  $x = -\frac{1}{2}$ ,  $x = -2$ ,  $y = 0$



46. slant asymptote:  $y = x - 3$   
point discontinuity:  $x = -3$



47. 4    48.  $\frac{1 \pm \sqrt{11}}{2}$     49.  $\frac{25}{2}$

50.  $0 < x < 2$  or  $x > \frac{9}{4}$

51. no real solution

52.  $-8 \leq x \leq 1$

53. 34    54. 11

55. 1; 1;  $-1, \frac{2}{3}$

56. 3 or 1; 1; none

57. -1.4, 3.4

58. -1, -3.6, 0.6

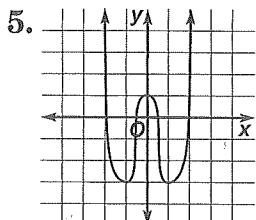
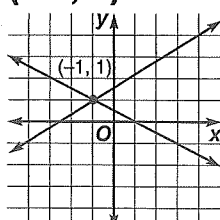
## Unit 1 Test

1. max.: 6; min.: 3

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

3.  $4x^2 - 9x + 25$

4. (-1, 1)



6. (5, 1, 2)

7.  $\frac{5}{n+6} - \frac{3}{4n-1}$

8. both axes

9. as  $x \rightarrow \infty$ ,  $f(x) \rightarrow -\infty$ ;  
as  $x \rightarrow -\infty$ ,  $f(x) \rightarrow -\infty$

10. infinitely many

11.  $-\frac{2}{3}, 3$

12.  $\frac{-2 - \sqrt{10}}{3} \leq y \leq \frac{-2 + \sqrt{10}}{3}$

13.  $-\frac{1}{2x^2}$     14. no

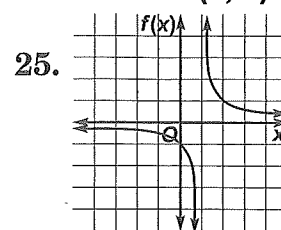
15. no;  $y = \pm\sqrt{10x}$     16. yes; 8

17. translated 2 units to the right

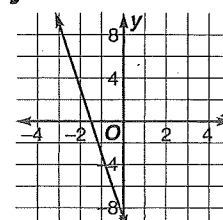
18.  $y = -x - 1$     19. yes

20. 20 mph    21. no solution

22. 64    23. (4, 2)    24. 1.5



26.  $y = -6x - 9$



27.  $x + 3y - 18 = 0$

28. 5; no    29. 12    30. 11

31.  $y = x - 5$     32. -41

33.  $D = \{-5, -2, 4\}$ ;  
 $R = \{0, 1, 2, 3\}$ ; no

34. neither    35. 1

36.  $-\frac{2}{3} \leq x \leq 2$

37.  $\begin{bmatrix} 3 & 11 \\ 4 & 18 \end{bmatrix}$     38. -5

39.  $\{(-1, 1), (0, 2), (1, 1)\}$ ; yes

40. infeasible    41.  $\frac{-2 \pm 3\sqrt{2}}{2}$

42. infinite discontinuity

43.  $-\frac{8}{3a}$     44. 2000; 3500

45. 3 ft  $\times$  7 ft  $\times$  4 ft

46. (4, -1, 3)    47.  $\frac{1}{2}, -\frac{7}{2}$

48. max.: (1, -3)    49. (1, 2)

50.  $3x + 2y - 11 = 0$

# Chapter 5 Assessment Answer Key

Form 2A  
Page 73

1. C

2. G

3. A

4. H

5. D

6. G

7. C

8. F

9. D

10. F

Page 74

11. B

12. J

13. C

14. J

15. D

16. F

17. B

18. F

19. C

20. J

B: Sample answer:  
 $16x^2 + 3 = 0$

Form 2B  
Page 75

1. B

2. H

3. B

4. J

5. A

6. H

7. A

8. J

9. A

10. H

Page 76

11. C

12. G

13. D

14. F

15. B

16. G

17. D

18. H

19. A

20. F

B: Sample answer:  
 $9x^2 + 2 = 0$