Intermediate Algebra
Math 097

Evaluates/Practice Tests

For solutions, refer to the back of the PAN.

Practice Test

Take this practice test to be sure that you are prepared for the final quiz in Evaluate.

1. Solve for x: $2(x + 4) - 3x = 0$

2. Solve for y: $15y - 20 = 14y - 9$

3. Circle the value of z that is the solution of the equation $12\left(z + \frac{1}{3}\right) = -20$.

   $z = 3$

   $z = 0$

   $z = -2$

4. Solve for x: $-4 - 4(2x + 3) = 16$

5. Solve for x: $\frac{1}{2}x + 4 = \frac{1}{5}x + 7$

6. Solve for x: $z = 3x - 5y$

7. Circle the values of y that are solutions of the inequality $3y + 5 < 14$.

   $y = -1$

   $y = 1$

   $y = 3$

   $y = 5$

8. Solve the following inequality, then graph the solution on the number line.

   $0 \leq 5(x + 2) < 25$

EVALUATE

Practice Test

Take this practice test to be sure that you are prepared for the final quiz in Evaluate.

1. Look at Figure EII.E.10. Determine in which quadrant the points *P*, *Q*, and *R* lie.

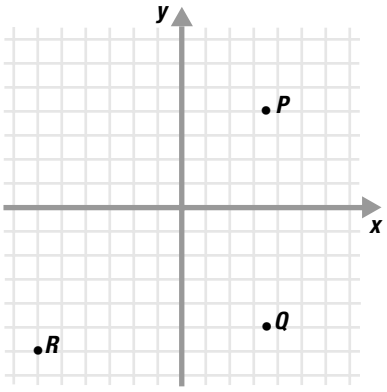


Figure EII.E.10

2. Find the distance, *d*, between the point (6, 11) and the point (–3, –1).

3. Find both the rise (change in *y*) and the run (change in *x*) in moving from the point (2, 3) to the point (5, 1).

4. A line passes through the points (0, 6) and (–3, –3). Find its slope.

5. Circle the equation of the line through the point (20, –7) that has slope 9.

$$y - 7 = 9(x - 20)$$

$$y - 20 = 9(x + 7)$$

$$x + 7 = 9(y - 20)$$

$$y + 7 = 9(x - 20)$$

6. Find the *y*-intercept of the line that has slope $m = \frac{1}{2}$ and passes through the point $\left(-3, \frac{1}{2}\right)$.

7. Find the equation of the vertical line and the equation of the horizontal line that pass through the point (–11, 17).

8. Find the standard form of the equation of the line that passes through the point (0, 5) and is perpendicular to $y = -\frac{1}{8}x + 30$.

EVALUATE

Practice Test

Take this practice test to be sure that you are prepared for the final quiz in Evaluate.

1. Find the solutions of the following equations.

   a. $|x - 5| = 9$ b. $|8x| = 24$

2. Solve for x: $|x + 3| - 8 = 19$

3. Solve for x: $|2x + 5| = |x + 7|$

4. Circle the solution of this equation: $5|4x - 7| + 12 = 7$

   $x = 2$ or $x = 3$

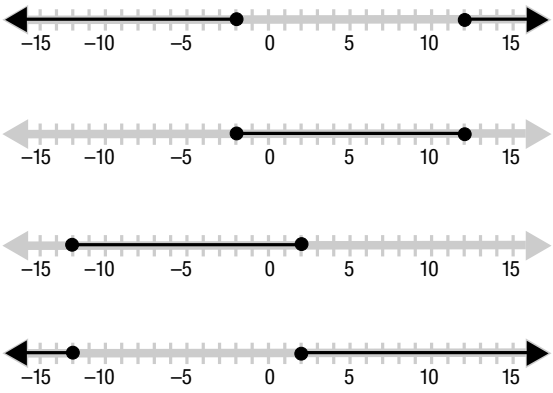
   $x = -2$ or $x = -3$

   $x = 2$ or $x = -3$

   $x = -2$ or $x = 3$

   the equation has no solution

5. Circle the graph that represents the solution of this inequality: $|x - 5| \leq 7$



6. Solve for x: $|4x - 6| > 18$

7. Circle the inequality whose solution is graphed below.

   $|x| \geq 4$

   $|x| \leq 4$

   $|x| > 4$

   $|x| \leq 4$

8. Solve for x: $|-4x - 4| < 16$

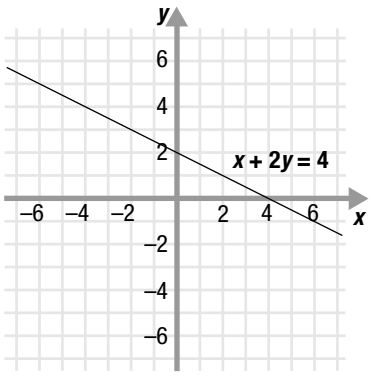
EVALUATE

Practice Test

Take this practice test to be sure that you are prepared for the final quiz in Evaluate.

1. Graph the inequality $y > \frac{2}{3}x - 1$.

2. The graph of the line $x + 2y = 4$ is shown in Figure 4.3.5. Circle the point(s) below that satisfy the inequality $x + 2y \leq 4$.



(0, 0)

(5, 2)

(–3, –1)

(8, –4)

Figure 4.3.5

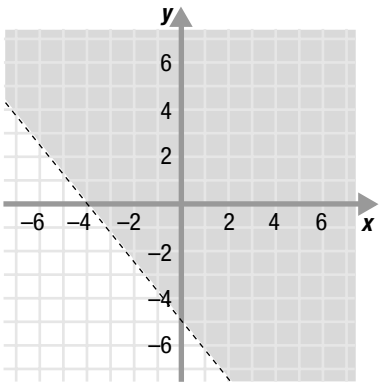
3. Graph the inequality $y \leq 2x - 1$.

4. Circle the point(s) below that satisfy the linear inequality $y \leq 4$.

(23, 56) (0, 0)

(8, –14) (–6, 7)

5. Circle the inequality below that has a solution represented on the graph shown in Figure 4.3.6.



$5x + 4y > -20$

$4x - 5y < 20$

$4x + 5y > -20$

$5x - 4y < 20$

Figure 4.3.6

6. Graph the inequality $y \leq 2x + 3$.

7. The graph of the equation $y = -\frac{1}{2}x - 2$ is shown in Figure 4.3.7. Circle the point(s) below that satisfy the inequality $y > -\frac{1}{2}x - 2$.

(1, 2)

(–3, 3)

(–5, 6)

(2, –5)

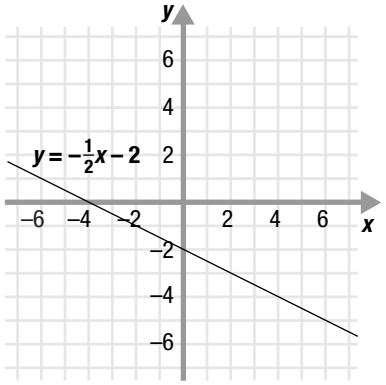
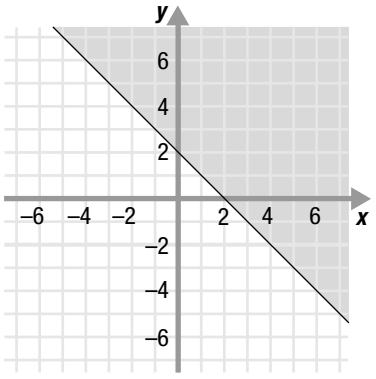


Figure 4.3.7

8. Circle the inequality below that has a solution represented on the graph shown in Figure 4.3.8.



$y > -x + 2$

$y < -x + 2$

$y \leq -x + 2$

$y \geq -x + 2$

Figure 4.3.8

EVALUATE

Practice Test

Take this practice test to be sure that you are prepared for the final quiz in Evaluate.

1. The sum of two numbers is 25. When twice the larger number is subtracted from four times the smaller number, the result is 4. What are the two numbers?
2. Sunil has 19 five dollar and ten dollar bills worth a total of $150. How many of each does she have?
3. Last year a small college accepted 363 students out of the 1340 people that applied. If the college accepted 30% of the female applicants and 25% of the male applicants, how many women applied?
4. The local coffee shop combines two kinds of beans to make a blended mixture of beans. If Ethiopian Harrar beans cost $7.25 per pound, and Arabian Mocha beans cost $13.70 per pound, how many pounds of each should be used to make 3 pounds of a blend that costs $10.26 per pound?
5. In 7 years Deac will be twice as old as Irina. Four years ago he was three times as old as Irina was then. How old are each of them now?
6. Admission to a skating rink is $4.25 for children and $7.50 for adults. If one evening the skating rink collected $930 and 150 people were admitted, how many children went skating?
7. Nobutaka needs 200 ml of 6% HCl. If he has solutions of 5% HCl and 9% HCl, how many milliliters of each should he mix together?
8. Alexis had $2375 to invest last year. She put some of her money in a savings account that paid 4% interest and the rest of her money in a mutual fund that paid 11% interest. If she earned $168.50 in interest, how did she divide her money between the two accounts?

EVALUATE

Practice Test

Take this practice test to be sure that you are prepared for the final quiz in Evaluate.

1. Graph the system of inequalities below. Use the grid in Figure 5.3.2. Then write the coordinates of the plotted points that are solutions of this system.

$$y < \frac{2}{3}x + 1$$
$$x + y \geq -6$$

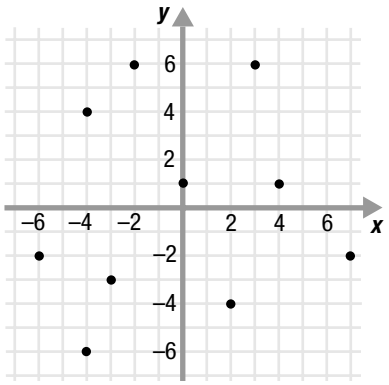


Figure 5.3.2

2. Graph the system of inequalities below to find its solution.

$$x + 2y \leq 4$$
$$y > 3$$

3. Graph the system of inequalities below. Use the grid in Figure 5.3.3. Then write the coordinates of the plotted points that are **not** solutions of either inequality in this system.

$$2x - 5y < 15$$
$$3x + 4y \leq -5$$

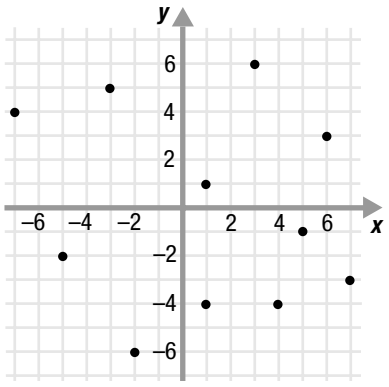


Figure 5.3.3

4. Graph the system of inequalities below to find its solution.

$$y \leq x + 3$$
$$y \geq x - 4$$

5. Graph the system of inequalities below to find its solution.

$$x \leq 2$$
$$y \geq -3$$
$$2y \leq 3x + 2$$

6. Graph the system of inequalities below. Use the grid in Figure 5.3.4. Then write the coordinates of the plotted points that are solutions of this system.

$$y \geq 0$$
$$x \geq -6$$
$$y \leq -\frac{1}{2}x + 2$$

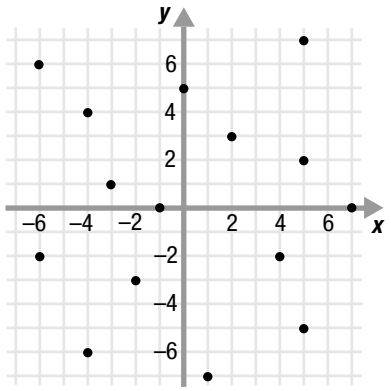


Figure 5.3.4

Practice Test

Take this practice test to be sure that you are prepared for the final quiz in Evaluate.

1. A positive number, a, has principal square root 1.1.
   a. What is another square root of a?
   b. What is the value of a?
2. The number $\sqrt[3]{-30}$ lies between what two consecutive integers?
3. Simplify the quotient of these square roots: $\frac{\sqrt{147}}{\sqrt{3}}$
4. Use prime factorization to simplify this radical: $\sqrt{28u^3}$ Here, u is a nonnegative number.
5. Find: $\sqrt{99} + \sqrt{44} - \sqrt{50} - \sqrt{2}$
6. Multiply $3 - 5\sqrt{2}$ by its conjugate. Enter the result.
7. For each given radical expression, rationalize the denominator.
   a. $\frac{5}{\sqrt[3]{-6}}$
   b. $\frac{3}{1+\sqrt{7}}$
8. Solve this equation for x: $3\sqrt{5-x} = 12$

EVALUATE

Practice Test

Take this practice test to be sure that you are prepared for the final quiz in Evaluate.

Assume that x, y, and z are positive numbers.

1. Simplify: $\sqrt[5]{x} \cdot \sqrt{x}$

2. Rewrite the expression using rational exponents.

$\sqrt[5]{243^3}$

3. Circle the real number(s) in the list below:

$\sqrt{-100}$

$\sqrt[3]{-125}$

$\sqrt[4]{-16}$

$\sqrt[6]{-729}$

4. Simplify: $\left(\frac{8y^{-\frac{1}{2}}}{7^{\frac{3}{2}}x}\right)^2$

5. Simplify: $\sqrt{\frac{169}{225}}$

6. Calculate: $\sqrt{(-29)^2}$

7. Which of the radical expressions below is simplified?

$\sqrt{\frac{3}{16}}$

$\frac{xy}{\sqrt{8}}$

$\frac{\sqrt{25}}{}$

$\frac{\sqrt[3]{3}}{2}$

8. Simplify: $\sqrt{\frac{81x^2y^2}{121z}}$

9. Simplify: $6\sqrt{5x} + 3\sqrt{125x} - 3$

10. Find: $(3\sqrt{5} - 8)(3\sqrt{5} + 8)$

11. Find: $(3\sqrt{2} + 3)(2\sqrt{2} - 6)$

12. Find: $\frac{\sqrt{y}}{\sqrt[3]{y}}$

EVALUATE

Practice Test

Take this practice test to be sure that you are prepared for the final quiz in Evaluate.

1. Write this quadratic equation in standard form and identify a, b, and c.

   $$1 + 2x(x - 8) = x + 3$$

2. Solve the equation $6x^2 - 24x = 0$ by factoring.

3. Circle the quadratic equations.

   $x = 22 + 1$

   $2 = (x - 3)^2$

   $x^2 = x^2 + \frac{3}{x^2} + 8x$

   $x(x + 9) = 4$

   $x^2 - 9 = 7x + 2$

4. Solve $2x^2 - x - 15 = 0$.

5. Circle the expressions below that are equal to 8.

   $-\sqrt{64}$ $\qquad$ $\frac{\sqrt{256}}{\sqrt{4}}$

   $\sqrt{(-8)^2}$ $\qquad$ $\frac{\sqrt{192}}{3}$

   $\sqrt{9 + 16}$ $\qquad$ $\sqrt{\frac{64}{5}} \cdot \sqrt{5}$

6. Solve $x^2 = 343$ using the square root property.

7. Solve this equation for x:

   $$x = \frac{\frac{\sqrt{20}}{\sqrt{3}}}{\frac{\sqrt{8}}{\sqrt{3}}}$$

8. Solve $(x - 5)^2 = 164$ using the square root property.

EVALUATE

Practice Test

Take this practice test to be sure that you are prepared for the final quiz in Evaluate.

1. Complete the square for this expression.

   $x^2 + 9x + ?$

   What is the perfect square?

2. Solve $4x^2 + 8x = 152$ by completing the square.

3. After completing the square by adding 16 to both sides, the result is $(x + 4)^2 = 2$. What was the original equation?

4. Solve $4x^2 - 5x + 1 = 0$ by completing the square.

5. Circle the equation below that has the solution $x = \frac{-2 \pm 3\sqrt{2}}{2}$.

   $x^2 + 4x - 7 = 0$

   $2x^2 + 4x - 7 = 0$

   $2x^2 + 4x + 7 = 0$

   $x^2 - 4x - 7 = 0$

6. Use the quadratic formula to solve this quadratic equation:

   $6x = 1 - 5x^2$

7. Circle the quadratic equations below that have no real solutions.

   $x^2 + 5x - 9 = 0$

   $x^2 + 4x + 11 = 0$

   $x^2 - x + 1 = 0$

   $4x^2 + 5x + 1 = 0$

   $2x^2 - 10x - 3 = 0$

   $x^2 + 2x + 5 = 0$

8. Find the two values for b for which the quadratic equation $9x^2 + bx + 36 = 0$ has two equal real solutions.

9. The quadratic equation $x^2 - 7x + c = 0$ has a discriminant of 45. What is the value of c? What are the solutions of the equation?

10. The sum of the solutions of a quadratic equation is $\frac{3}{2}$. The product of its solutions is 3. What is the equation?

11. Find a quadratic equation whose two solutions are –3 and $\frac{1}{5}$.

12. Find the greatest possible value of c in the quadratic equation $2x^2 - 7x + c = 0$ for which there are two real solutions.

EVALUATE

Practice Test

Take this practice test to be sure that you are prepared for the final quiz in Evaluate.

1. Find:

   a. $(7 + 2i) + (4 + 6i)$

   b. $(7 + 2i) - (4 + 6i)$

2. Circle the expressions below that are equal to $8 + 4i$.

   $(2i)(4i + 2)$

   $3i + 6i - i$

   $-8i^2 - 4i^3$

   $\sqrt{-64}$

3. Find: $(3 + \sqrt{-16}) + (2 + \sqrt{-9})$

4. Find: $(4 + 2i)(3 + 5i)$

5. Find: $(5 + 3i)(5 - 3i)$

6. Find: $2 \div (4 + 7i)$

7. Circle the expressions below that are equal to i.

   i^4

   i^{37}

   $(i^5)^{10}$

   $-i^3$

8. Use the quadratic formula to find the solutions of each equation below.

   a. $x^2 + 3x + 7 = 0$

   b. $x^2 - 5x + 9 = 0$

   c. $3x^2 + 2x + 1 = 0$

EVALUATE

Practice Test

Take this practice test to be sure that you are prepared for the final quiz in Evaluate.

1. Which of the points below satisfy the function $y = 3x^2 + 1$?

   (0, 1) (–2, 13)

   (3, 8) (1, 4)

   (–4, 11)

2. Given the function $f(x) = x^2 + 3x$, find:

   a. $f(0)$

   b. $f(3)$

   c. $f(–2)$

   d. $f(–5)$

3. Use the graph of the function $y = x^2 – 2$, shown on the grid in Figure 11.1.21, to find its domain and range. Write the domain and the range in interval notation.

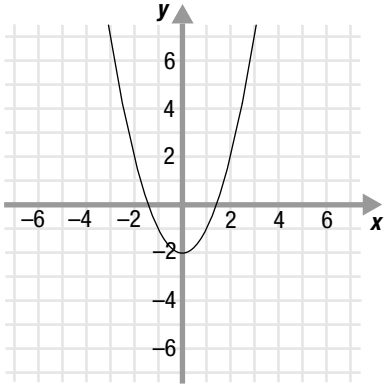


Figure 11.1.21

4. Given the functions $f(x) = 4x – 5$ and $g(x) = 1 – 3x$, find:

   a. $f(7)$

   b. $g(7)$

   c. $f(–2)$

   d. $g(–2)$

5. The graph of the function $y = 2x$ is shown on the grid in Figure 11.1.22.

   a. Find the equation of line A.

   b. Find the equation of line B.

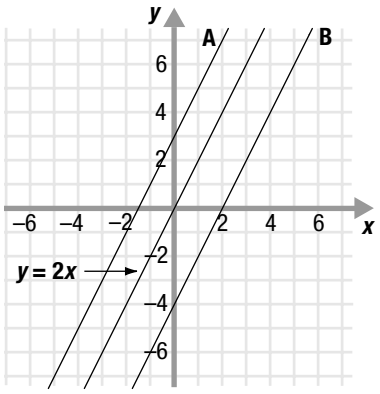


Figure 11.1.22

6. The graph of the function $y = |x – 5|$ is shown on the grid in Figure 11.1.23. Use this graph to find the domain and range of $y = |x – 5|$. Write the domain and the range in interval notation.

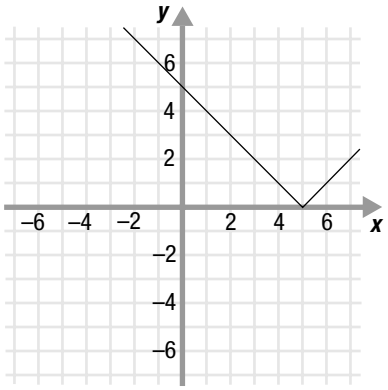


Figure 11.1.23

7. The graphs of the functions $y = |x| + 3$ and $y = -|x| + 3$ are shown on the grid in Figure 11.1.24. Use these graphs to decide which of the statements below are true.

   Both functions have the same domain.

   Both functions have the same range.

   The point (0, 3) satisfies both equations.

   The point (3, 0) satisfies both equations.

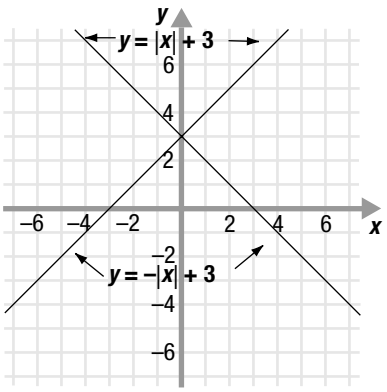


Figure 11.1.24

8. The graph of the function $y = x$ is shown on the grid in Figure 11.1.25. Circle the points below that lie on the graph of $y = x - 4$.

   (5, 1)

   (2, –2)

   (1, 3)

   (0, –4)

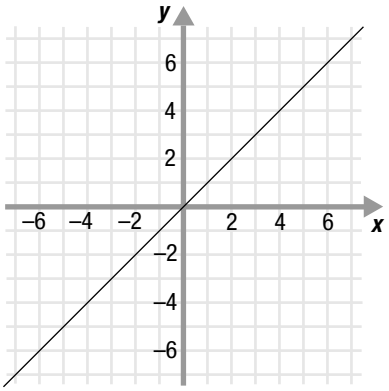


Figure 11.1.25

9. The graph of the parabola $y = x^2 - 4x - 5$ is shown on the grid in Figure 11.1.26. Use this graph to help you find the x-intercepts of the function.

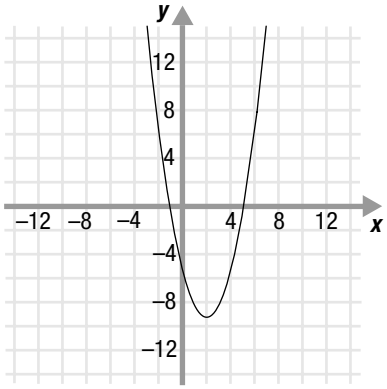


Figure 11.1.26

10. The graphs of the parabolas $y = x^2 - 4$ and $y = 2x^2 - 8$ are shown on the grid in Figure 11.1.27. Use these graphs to decide which of the statements below are true.

    Both functions have the same domain.

    Both functions have the same range.

    Both graphs have the same vertex.

    Both graphs have the same x-intercepts.

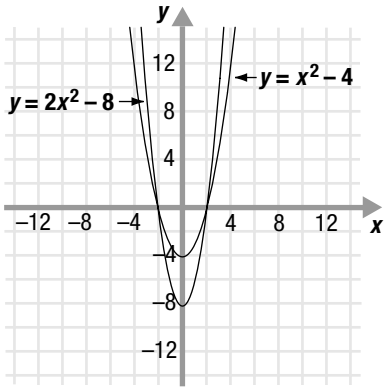


Figure 11.1.27

11. Circle the functions below that are **not** quadratic functions.

    $y = 2x^2$

    $y = 4x + 1$

    $f(x) = -3x + 7$

    $y = x^2 - 5x + 8$

    $f(x) = -6 + x^2$

12. The graph of the parabola $y = x^2 + 4x + 3$ is shown on the grid in Figure 11.1.28. If the graph is moved up 3 units, what is the vertex of the new parabola?

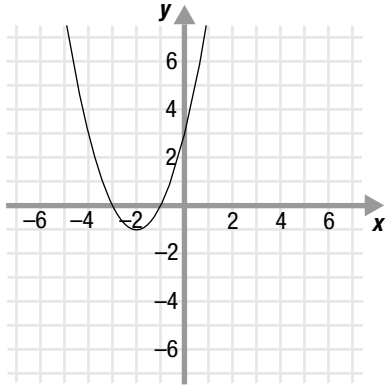


Figure 11.1.28

13. The graph of the function $f(x) = \frac{1}{4}x^3 - 2$ is shown on the grid in Figure 11.1.29. Use this graph to find the values of:

    a. $f(2)$

    b. $f(0)$

    c. $f(-2)$

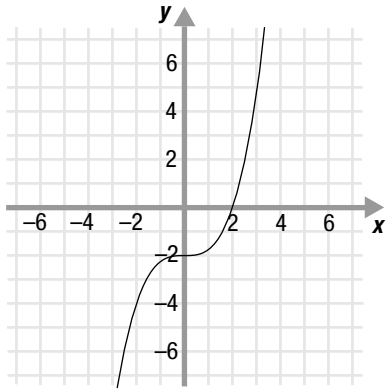


Figure 11.1.29

14. The graph of $y = 2|x - 1| + 4$ is shown on the grid in Figure 11.1.30. Use the graph to decide which of the statements below are true.

    The domain of $y = 2|x - 1| + 4$ is all real numbers.

    The range of $y = 2|x - 1| + 4$ is the interval $[4, \infty)$.

    For each input value, x, there is only one output value y.

    For each output value, y, there is only one input value x.

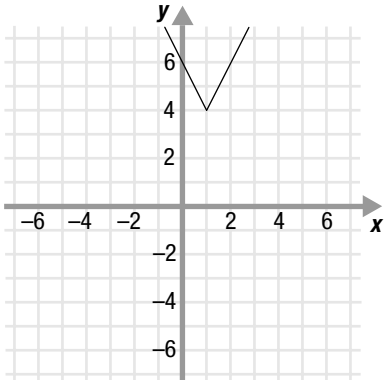
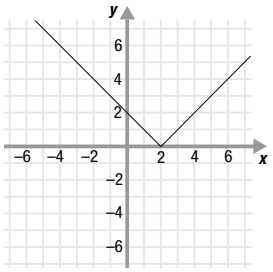
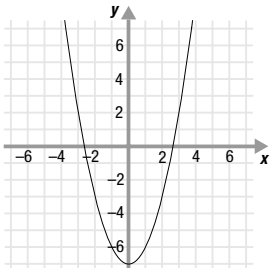
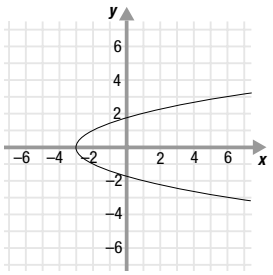


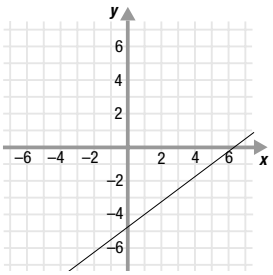
Figure 11.1.30

15. Determine which of the graphs below are functions by using the vertical line test.

a.


b.


c.


d.


16. The graph of the function $y = -x^2 - 4x + 5$ is shown on the grid in Figure 11.1.31. Use this graph to:

    a. Find the domain of the function $y = -x^2 - 4x + 5$.

    b. Find the range of the function $y = -x^2 - 4x + 5$.

    c. Find the vertex of the function $y = -x^2 - 4x + 5$.

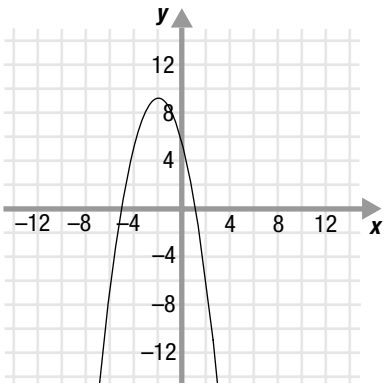


Figure 11.1.31

EVALUATE

Practice Test

Take this practice test to be sure that you are prepared for the final quiz in Evaluate.

1. Solve for x: $\frac{1}{x} - \frac{4}{3} = \frac{x}{4}$
2. What value of u can you substitute into the equation $5x^{-8} + 3x^{-4} - 2 = 0$ to get an equation in standard quadratic form?
3. Solve for y: $y^3 - 28 = 4y - 7y^2$
4. Solve for w: $\left(\frac{w-4}{w}\right)^2 = 5\left(\frac{w-4}{w}\right) - 6$
5. Solve for x: $\sqrt{x^2 + 6} - x = 3$
6. Solve for y: $\sqrt{y+8} - \sqrt{y+1} = 2$
7. Solve for x: $\sqrt[4]{x^3 + 54} - 2 = 1$
8. Solve for w: $(w+5)^{\frac{2}{3}} - 5 = -1$
9. Graph the parabola $y = x^2 - x - 2$. Use your graph to find the solutions of the quadratic equation $x^2 - x - 2 = 0$.
10. Graph the parabola $y = x^2 - 4x$ and the line $y = -3$. Use your graphs to find the solutions of the equation $x^2 - 4x = -3$.
11. The graphs of four parabolas are shown on the grid in Figure 13.1.1. Use these graphs to decide which of the equations below have one positive solution and one negative solution.

    $0 = x^2 + \frac{9}{2}x + 5$ (use graph a)

    $0 = \frac{1}{2}x^2 - \frac{5}{2}x - 3$ (use graph b)

    $0 = \frac{1}{3}x^2 - \frac{4}{3}x + 1$ (use graph c)

    $0 = x^2 - \frac{8}{3}x - 1$ (use graph d)

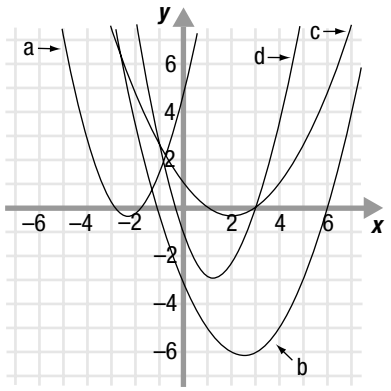


Figure 13.1.1

12. Graph the parabolas below. Use your graphs to determine for what values of c the equation $x^2 + 2x + c = 0$ has no solution.

    $y = x^2 + 2x - 3$

    $y = x^2 + 2x + 1$

    $y = x^2 + 2x + 4$

EVALUATE

Practice Test

Take this practice test to be sure that you are prepared for the final quiz in Evaluate.

1. The graph of the function $y = \frac{1}{2}x^2 + \frac{5}{2}x - 3$ is shown on the grid in Figure 13.3.22. Use this graph to solve the inequality $\frac{1}{2}x^2 + \frac{5}{2}x - 3 < 0$.

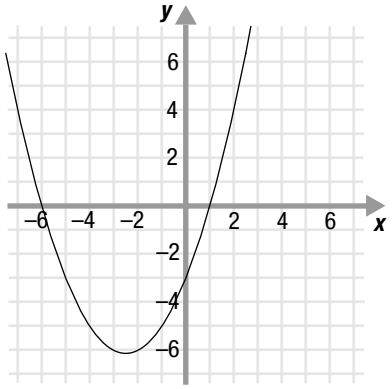


Figure 13.3.22

2. Solve the inequality $x^2 - 10 \leq 3x$ using the test point method.

3. Solve the inequality $x^2 - 8x \geq -16$ using the test point method.

4. The graph of $y = x^2 + 5x + 8$ is shown on the grid in Figure 13.3.23. Use this graph to decide whether each statement below is true or false.

   a. The solution of the inequality $x^2 + 5x + 8 > 0$ is all real numbers.

   b. The solution of the inequality $x^2 + 5x + 8 < 0$ is all real numbers.

   c. The solution of the equation $x^2 + 5x + 8 = 0$ is all real numbers.

   d. The inequality $x^2 + 5x + 8 > 0$ has no solutions.

   e. The inequality $x^2 + 5x + 8 < 0$ has no solutions.

   f. The equation $x^2 + 5x + 8 = 0$ has no real solutions.

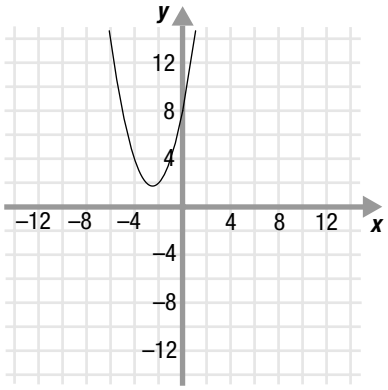


Figure 13.3.23

5. Solve the rational inequality $\frac{x-2}{x+3} > 0$ using the test point method.

6. Solve the rational inequality $\frac{1-2x}{x+9} \leq 0$ using the test point method.

7. Solve the rational inequality $\frac{x^2-4}{x+5} < 0$.

8. The graph of the function $y = \frac{x^2+2}{x+1}$ is shown on the grid in Figure 13.3.24.

   Find the solution of the inequality $\frac{x^2+2}{x+1} \geq 0$.

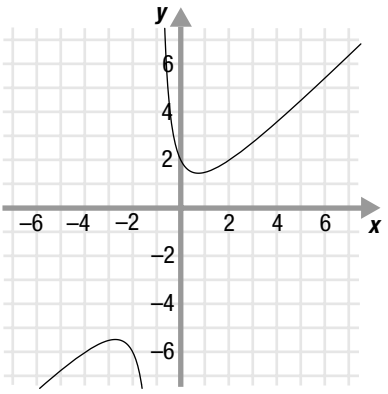


Figure 13.3.24

9. The graphs of $y = x^2 - 2x - 8$ and $y = 2x^2 - 4x - 16$ are shown on the grid in Figure 13.3.25. Find the values of x that satisfy both $x^2 - 2x - 8 \geq 0$ and $2x^2 - 4x - 16 \geq 0$.

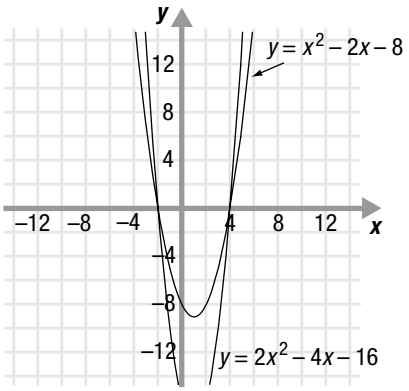


Figure 13.3.25

10. The graph of $y = \frac{1}{64}x^4 - \frac{5}{16}x^2 + 1$ is shown on the grid in Figure 13.3.26.

    Find where $\frac{1}{64}x^4 - \frac{5}{16}x^2 + 1 < 0$.

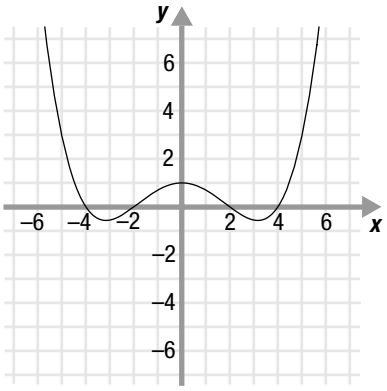


Figure 13.3.26

11. The graph of $y = \frac{x-1}{x^2 + x - 20}$ is shown on the grid in Figure 13.3.27. Use the graph of the function to find the solution of the inequality $\frac{x-1}{x^2 + x - 20} \geq 0$.

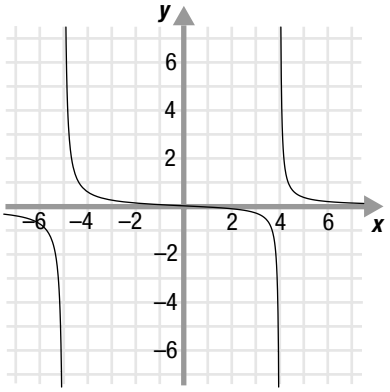


Figure 13.3.27

12. Given the function $y = \frac{x^2 - 9}{x - 5}$, for each value of x below, determine whether y is positive, negative, 0, or undefined.

    a. –10

    b. –3

    c. 0

    d. 5

    e. 14