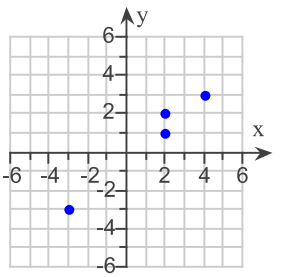
1. Use the quadratic formula to solve the equation. The equation has real number solutions.

$$-8y = 3y^2 - 3$$

$y =$ ☐

(Type a simplified answer, using fractions and radicals as needed. Use a comma to separate answers as needed.)

2. Determine whether the graph on the right is the graph of a function.



Is the given graph the graph of a function?

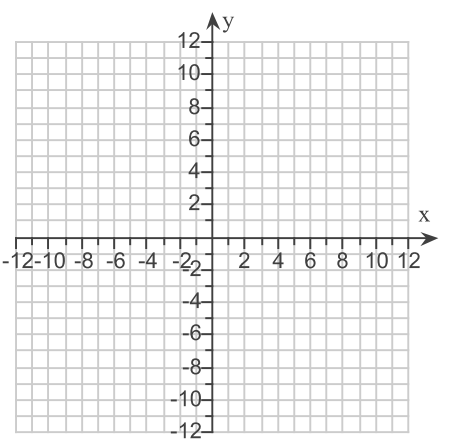
- ○ Yes
- ○ No

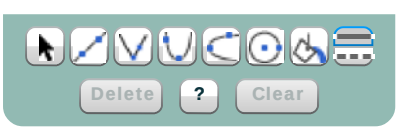
3. Sketch the graph of the quadratic function and the axis of symmetry. State the vertex, and give the equation for the axis of symmetry.

$$f(x) = (x-2)^2 + 7$$

Use the graphing tool to graph the function as a solid curve and the axis of symmetry as a dashed line.

Click to enlarge graph





The vertex is ☐.

(Type an ordered pair.)

The axis of symmetry is ☐.

(Type an equation.)

4. Given the following function, find $h(-4)$.

$$h(x) = 9x^2 + 2$$

$h(-4) =$ ☐ (Simplify your answer. Type an integer or a fraction.)

5. The cost C in dollars of manufacturing x bicycles at a production plant is given by the function shown below.

$$C(x) = 3x^2 - 1200x + 133{,}000$$

a. Find the number of bicycles that must be manufactured to minimize the cost.
b. Find the minimum cost.

a. How many bicycles must be manufactured to minimize the cost?

☐ bicycles

b. What is the minimum cost?

$☐

6. Use the square root property to solve the equation. The equation has real number solutions.

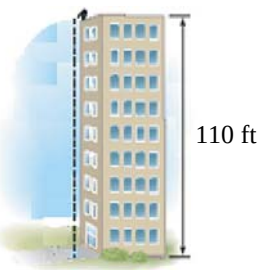
$$(3x + 1)^2 = 32$$

x = ☐

(Simplify your answer. Type an exact answer, using radicals as needed. Use a comma to separate answers as needed.)

7. A ball is thrown downward from the top of a 110-foot building with an initial velocity of 26 feet per second. The height of the ball h after t seconds is given by the equation $h = -16t^2 - 26t + 110$.

How long after the ball is thrown will it strike the ground?

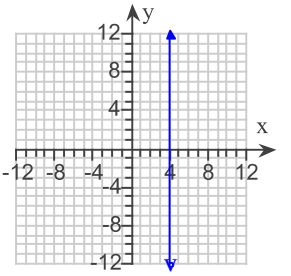


☐ sec

(Round to the nearest tenth as needed.)

8.

Find the domain and the range of the relation.



Choose the correct domain.

A. $(-\infty,4) \cup (4,\infty)$

B. $\{4\}$

C. $(-\infty,\infty)$

D. None of the above

Choose the correct range.

A. $(-\infty,4) \cup (4,\infty)$

B. $\{4\}$

C. $(-\infty,\infty)$

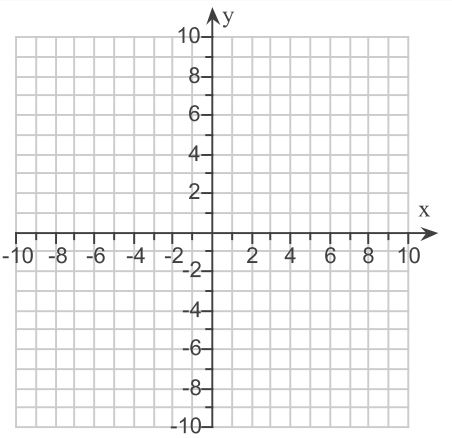
D. None of the above

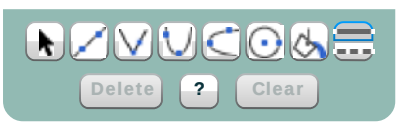
9.

Graph the function $f(x) = (x-1)^2 - 2$.

Use the graphing tool to graph the parabola.

Click to enlarge graph





10.

Solve the equation by completing the square. The equation has real number solutions.

$x^2 - 4x - 21 = 0$

$x =$ ☐

(Simplify your answer. Type an exact answer, using radicals as needed. Use a comma to separate answers as needed.)

11. Use the square root property to solve the equation.

$(x-5)^2 = -64$

$x =$ ☐

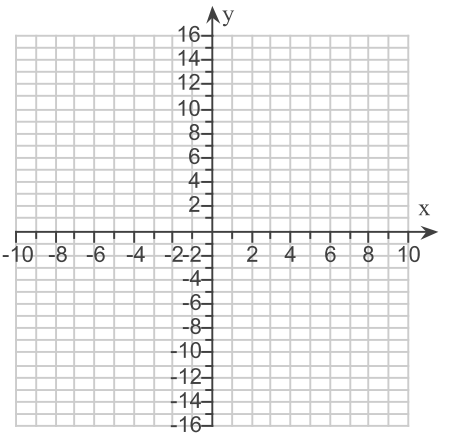
(Simplify your answer. Type an exact answer, using radicals as needed. Express complex numbers in terms of i. Use a comma to separate answers as needed.)

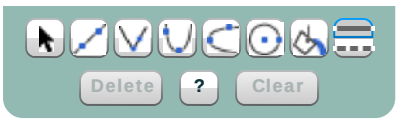
12. Sketch the graph of the quadratic function.

$f(x) = -x^2 - 8x - 15$

Use the graphing tool to graph the equation.

Click to enlarge graph





13. If a baseball is projected upward from ground level with an initial velocity of 128 feet per second, then its height is a function of time, given by $s = -16t^2 + 128t$.

What is the maximum height reached by the ball?

The maximum height reached by the ball is ☐ feet.

14. Find the domain of the given function.

$$h(x) = \frac{1}{x+8}$$

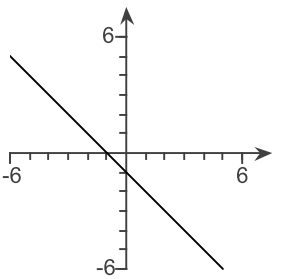
The answer is ☐. (Type your answer in interval notation.)

15. Neglecting air resistance, the distance $s(t)$ in feet traveled by a freely falling object is given by the function $s(t) = 16t^2$, where t is time in seconds. The height of a certain tower is 1010 feet. How long would it take an object to fall to the ground from the top of the building?

☐ seconds

(Round to two decimal places as needed.)

16. Use the vertical line test to determine whether the given graph is the graph of a function.



Is the graph the graph of a function? Choose the correct answer below.

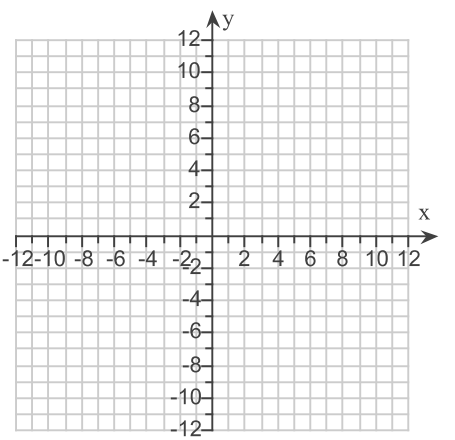
- ○ No
- ○ Yes

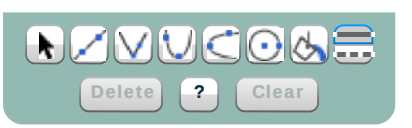
17. Sketch the graph of the quadratic function and the axis of symmetry. State the vertex, and give the equation for the axis of symmetry.

$F(x) = -2x^2 - 1$

Use the graphing tool to graph the function as a solid curve and the axis of symmetry as a dashed line.

Click to enlarge graph





The vertex is ☐.

(Type an ordered pair.)

The axis of symmetry is ☐.

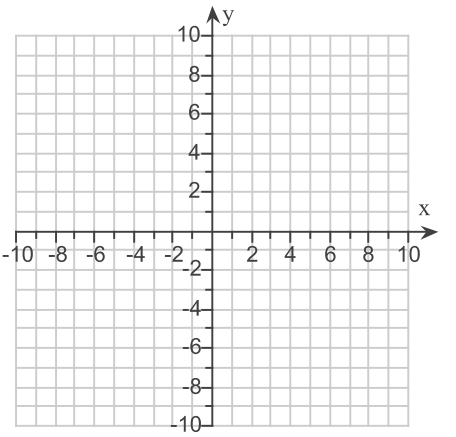
(Type an equation.)

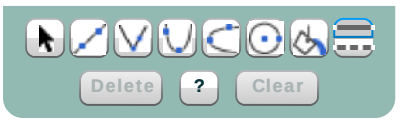
18. Sketch the graph of the quadratic function and the axis of symmetry. State the vertex, and give the equation for the axis of symmetry.

$F(x) = x^2 - 2$

Use the graphing tool to graph the function as a solid curve and the axis of symmetry as a dashed line.

Click to enlarge graph





The vertex is ☐.
(Type an ordered pair.)

The axis of symmetry is ☐.
(Type an equation.)

19. Use the discriminant to determine the number and type of the solution(s) of the equation.

$2 = -3x - 3x^2$

The equation has ☐ ▾ solution(s).
(Type an integer.)

20. Find the vertex of the graph of the quadratic function shown below. Determine whether the graph opens upward or downward, find any intercepts, and sketch the graph.

$$f(x) = -25x^2 + 10x + 3$$

The vertex is $\square$.
(Simplify your answer. Type an ordered pair.)

Does the graph open upward or downward?

- The parabola opens upward.
- The parabola opens downward.

Find any x-intercepts of the graph. Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

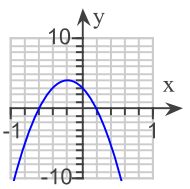
- A. The x-intercept(s) is(are) $\square$.
  (Simplify your answer. Type an ordered pair. Use a comma to separate answers as needed.)
- B. There is no x-intercept.

Find any y-intercepts of the graph. Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

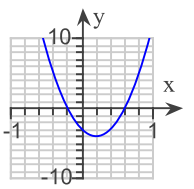
- A. The y-intercept(s) is(are) $\square$.
  (Simplify your answer. Type an ordered pair. Use a comma to separate answers as needed.)
- B. There is no y-intercept.

Choose the correct graph below.

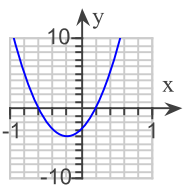
A.



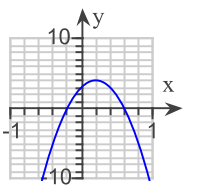
B.



C.

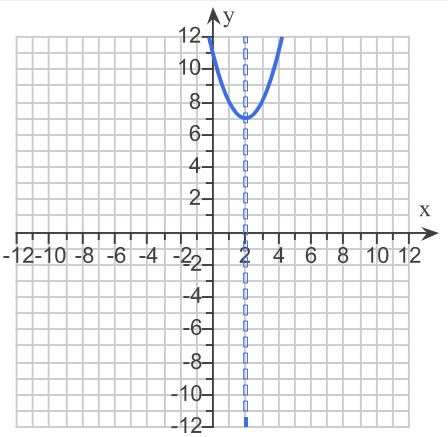


D.



1. $\frac{1}{3}, -3$

2. the second choice

3. 

(2,7)
x = 2

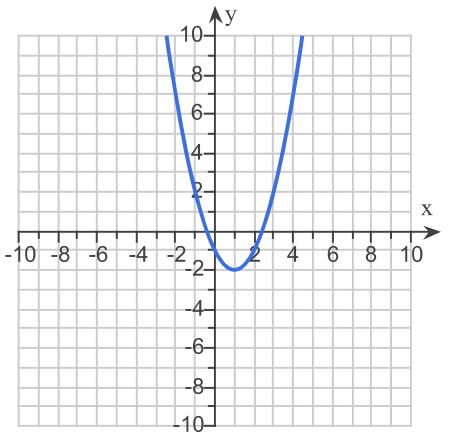
4. 146

5. 200
13,000

6. $\frac{-1+4\sqrt{2}}{3}, \frac{-1-4\sqrt{2}}{3}$

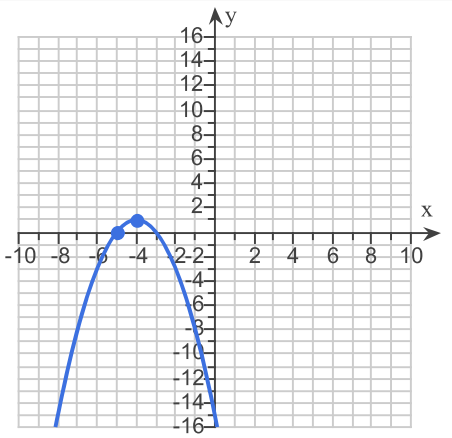
7. 1.9

8. B
C

9. 

10. $-3,7$

11. $5+8\,i, 5-8\,i$

12. 

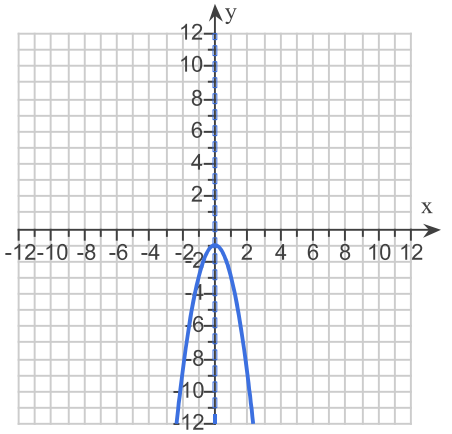
13. 256

14. $(-\infty, -8) \cup (-8, \infty)$

15. 7.95

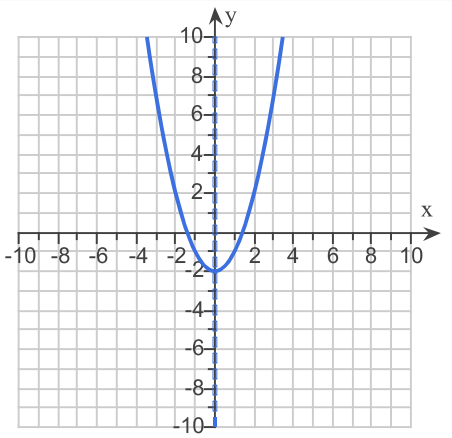
16. the second choice

17.



$(0, -1)$
$x = 0$

18.



$(0, -2)$
$x = 0$

19.

2
complex but not real

20.

$\left(\frac{1}{5}, 4\right)$
the second choice
A, $\left(-\frac{1}{5}, 0\right), \left(\frac{3}{5}, 0\right)$
A, $(0,3)$
D