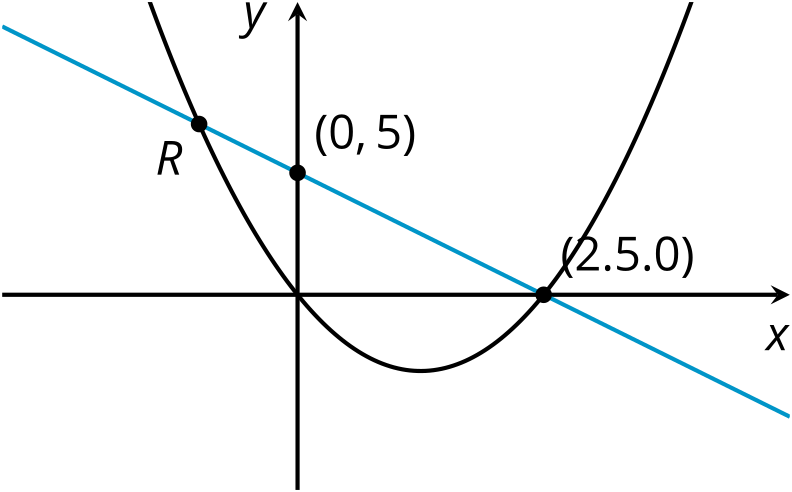
### Lesson 24 Practice Problems

1. The function represents the height of an object seconds after it is launched into the air. The function is defined by . Height is measured in meters.

* Answer each question without graphing. Explain or show your reasoning.
  1. After how many seconds does the object reach a height of 33 meters?
  2. When does the object reach its maximum height?
  3. What is the maximum height the object reaches?

1. The graphs that represent a linear function and a quadratic function are shown here.

* 
* The quadratic function is defined by .
* Find the coordinates of without using graphing technology. Show your reasoning.

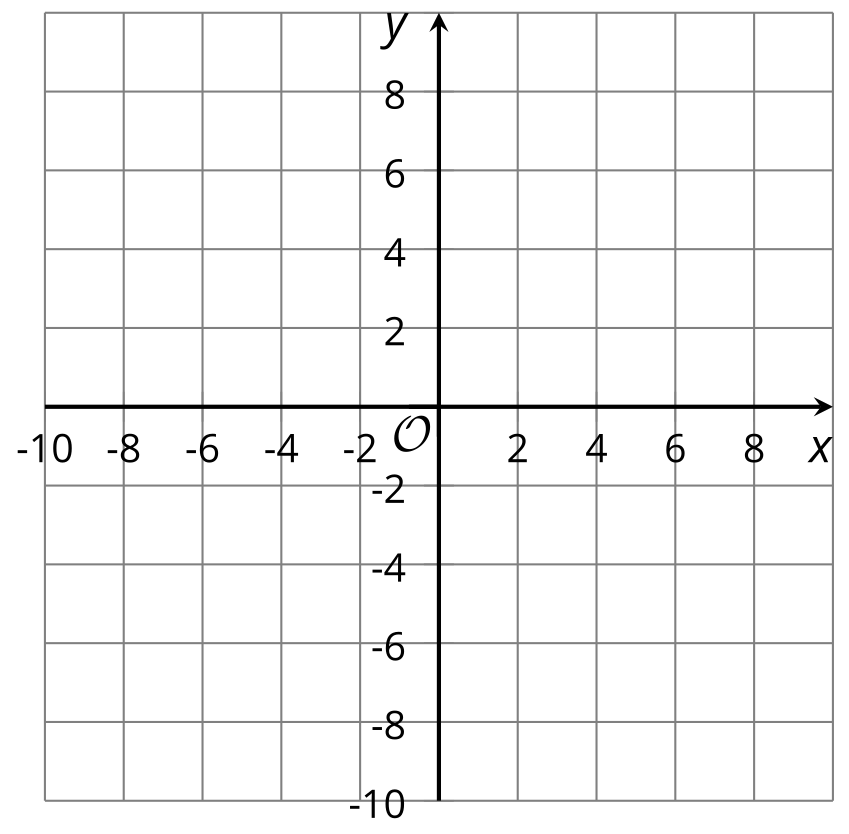
1. Diego finds his neighbor's baseball in his yard, about 10 feet away from a five-foot fence. He wants to return the ball to his neighbors, so he tosses the baseball in the direction of the fence.

* Function , defined by , gives the height of the ball as a function of the horizontal distance away from Diego.
* Does the ball clear the fence? Explain or show your reasoning.

1. Clare says, “I know that is an irrational number because its decimal never terminates or forms a repeating pattern. I also know that is a rational number because its decimal forms a repeating pattern. But I don’t know how to add or multiply these decimals, so I am not sure if and are rational or irrational."
   1. Here is an argument that explains why is irrational. Complete the missing parts of the argument.
      1. Let . If were rational, then would also be rational because . . . .
      2. But is not rational because . . . .
      3. Since is not rational, it must be . . . .
   2. Use the same type of argument to explain why is irrational.

* (From Unit 7, Lesson 21.)

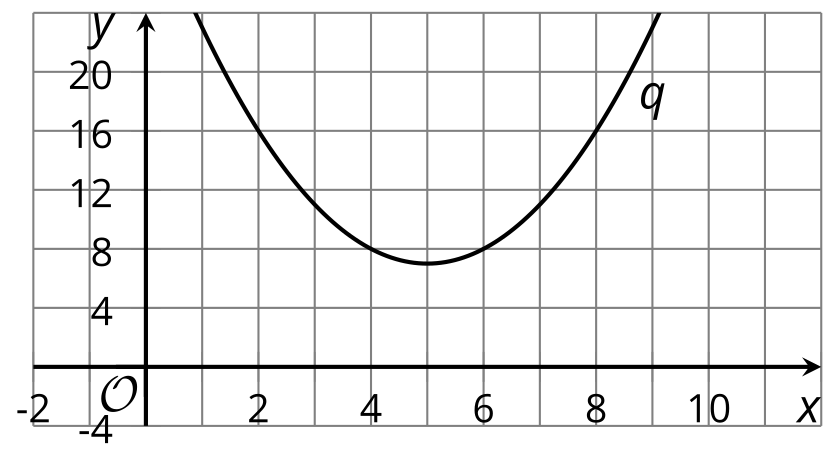
1. The following expressions all define the same quadratic function.
   1. What is the -intercept of the graph of the function?
   2. What are the -intercepts of the graph?
   3. What is the vertex of the graph?
   4. Sketch a graph of the quadratic function without using technology. Make sure the -intercepts, -intercept, and vertex are plotted accurately.

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* (From Unit 7, Lesson 22.)

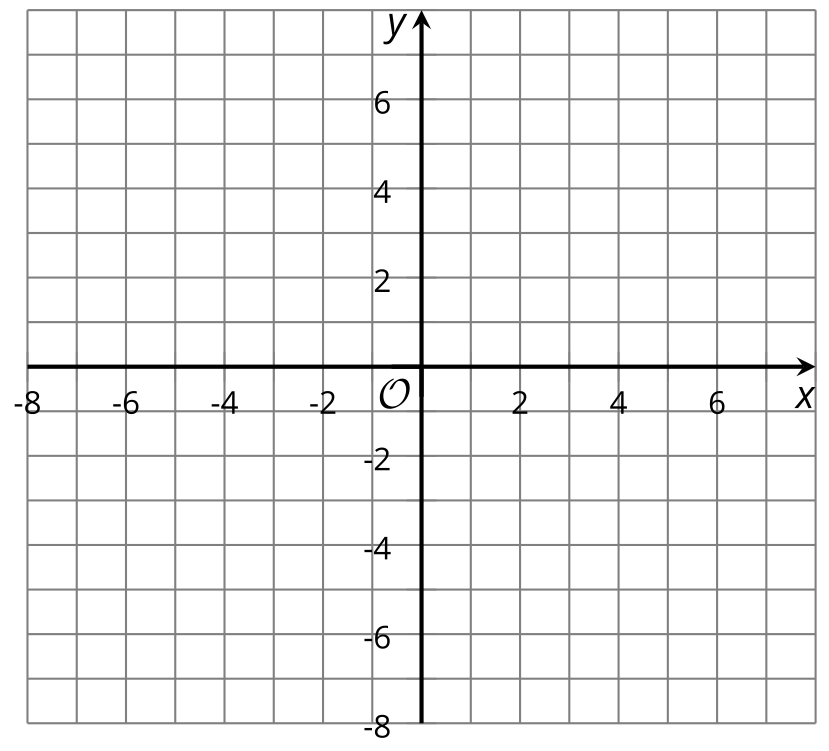
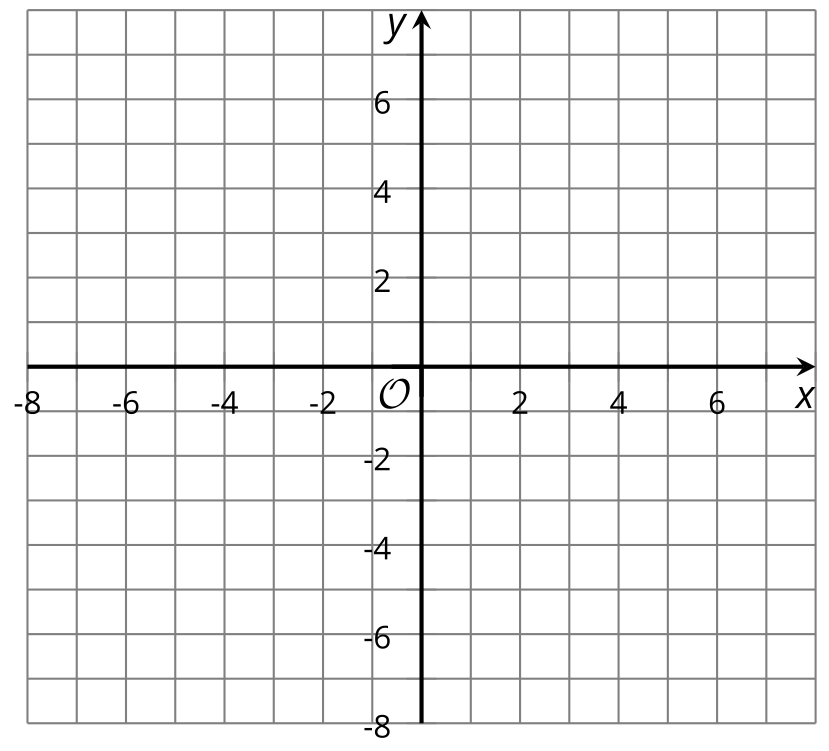
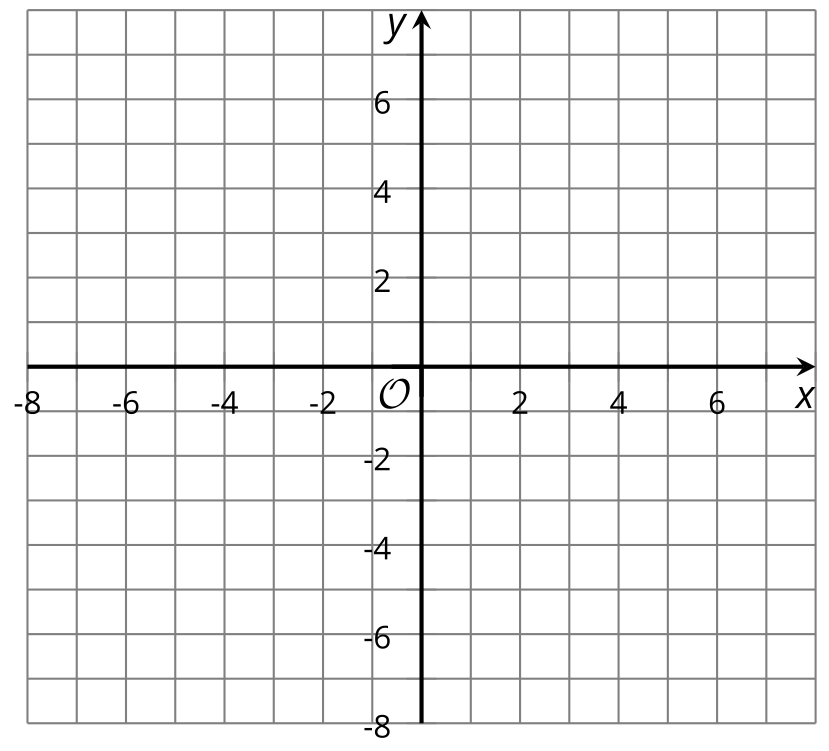
1. Here are two quadratic functions:  and .

* Andre says that both  and have a minimum value, and that the minimum value of is less than that of . Do you agree? Explain your reasoning.
* (From Unit 7, Lesson 23.)

1. Function is defined by the equation .

* Function is represented by this graph.
* Which function has the smaller minimum? Explain your reasoning.
* 
* (From Unit 7, Lesson 23.)

1. Without using graphing technology, sketch a graph that represents each quadratic function. Make sure the -intercepts, -intercept, and vertex are plotted accurately.

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* (From Unit 7, Lesson 22.)



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