

**Student Learning Outcomes:**

1. Students will be able to determine a quadratic function given a description.
2. Students will be able to apply a quadratic function to geometry.

## 1 Solve Applications Involving Quadratic Functions

1. A leaping cat follows a parabolic path. The cat jumps a maximum height of 5 feet and covers 6 feet of horizontal ground distance. Find an equation of the form  $y = a(x - h)^2 + k$  which represents the path of the cat.
2. An object is projected vertically upward from the top of a building with an initial velocity of 112 ft/sec. Its distance  $s(t)$  in feet above the ground after  $t$  seconds is given by the equation  $s(t) = -16t^2 + 112t + 110$ .
  - (a) Find its maximum distance above the ground.
  - (b) Find the height of the building.

## 2 Applying a Quadratic Function to Geometry

3. A parking area is to be constructed adjacent to a road. The developer has purchased 340 ft of fencing. Determine dimensions for the parking lot that would maximize the area. Then find the maximum area.

### Student Learning Outcomes Check

1. Can you determine a quadratic function given a description?
2. Are you able to apply a quadratic function to geometry?

**If any of your answers were no, please ask about these topics in class.**