

## Fireworks and Quadratic Functions

You are considering becoming a pyrotechnician.

Watch a video highlighting the type of work that you would be doing: <https://youtu.be/Osonavkd41U>

To learn more about the profession, you discover that if you know size of a firework shell and the angle in which the firework is launched, you can determine the speed in which the firework will travel, the height that the firework will reach, and the distance the firework will travel horizontally if the firework does not detonate.

Review the graphs at <http://www.pyroinnovations.com/display-fireworks-facts.html>

1. Analyzing the first graph from the above resource, determine the speed of a firework with a 12 inch shell travel.
  
  
  
  
  
  
  
  
  
  
2. Analyzing the second graph from the provided resource pertaining to a firework with a 12-inch shell launched at a 75-degree angle, determine the following:
  - a. What is the height in which the firework will reach?
  
  
  
  
  
  
  
  
  
  
  - b. What is the horizontal distance that the firework travels when the firework reaches its maximum height?
  
  
  
  
  
  
  
  
  
  
  - c. Calculate the distance that the firework will travel horizontally if the firework does not detonate.
  
  
  
  
  
  
  
  
  
  
  - d. Model the vertical height of the firework as a function of horizontal distance.