

## Human Cannonball Stunts

You are working as a safety coordinator for a variety show in Las Vegas where one of the acts involves a human cannonball.

Check out the view from the performer's perspective: <https://youtu.be/VcgPMxbgapE>

1. The performer wants to increase the height of her act for a future show, so you run a simulation and show her the results on a graph found at: <https://www.geogebra.org/geometry/sqqvsrwv>
  - a. Approximately how high will the NEW stunt set up project the performer?
  - b. How much higher will the performer travel compared to earlier acts as described in the video?
  - c. Approximately how far will the NEW stunt set up project the performer?
  
2. Analyzing the simulation graph found at <https://www.geogebra.org/geometry/sqqvsrwv>, approximate three points on the parabolic path of the new act.
  - a. Initial take-off point
  - b. Vertex
  - c. Landing point
  
3. Model the path of the performer as a quadratic function comparing horizontal distance and vertical distance where  $x$  represents horizontal distance and  $f(x)$  represents vertical distance.
  
  
  
  
  
  
  
  
  
  
4. Test the above quadratic function by graphing it at <https://www.geogebra.org/geometry/sqqvsrwv>
  
  
  
  
  
  
  
  
  
  
6. Using the function  $h(t) = -13t^2 + 49t + 7$  where  $t$  represents time and  $h(t)$  represents height of the simulated stunt, calculate, to the nearest tenth of a second, how long it will take the performer to land assuming that the safety air bag is position on the ground.