

Unit 8 Discussion Example – Post 1: Initial Thread

Human Cannonball

- a) The initial velocity, v , must be between 75 and 150 feet per second (fps), so I'll choose $v = 75$ fps.

The height, h , must be at least 10 feet off the ground but not more than 30, so I'll choose $h = 20$ feet.

- b) Substitute v and h in the equation to determine how many seconds it will take to land safely on the ground, $y = 0$ feet.

$$y = -16t^2 + vt + h$$

$$0 = -16t^2 + 75t + 20$$

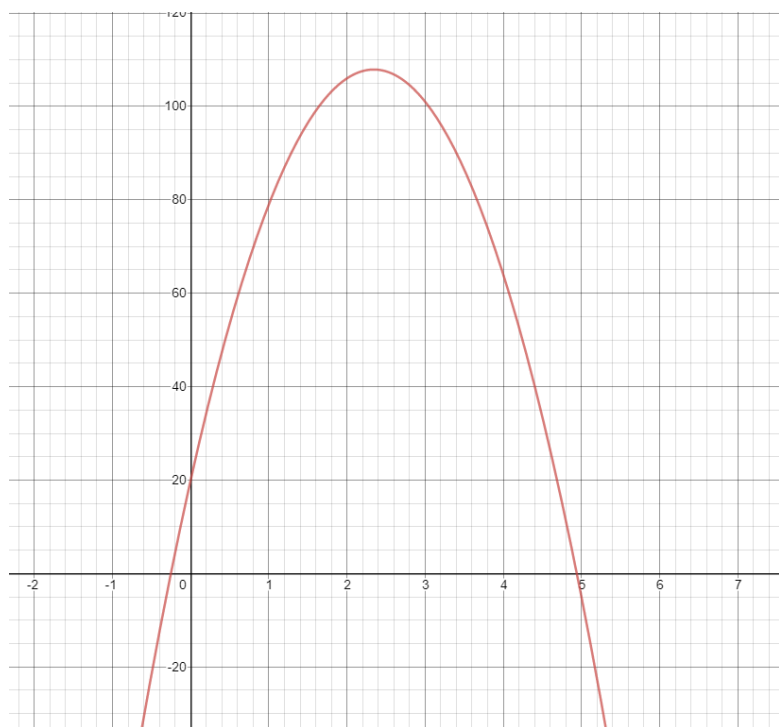
Using the Quadratic Formula and my calculator, I will solve for t .

$$t = -0.25 \text{ seconds}$$

$$t = 4.94 \text{ seconds}$$

We disregard $t \approx -0.25$ seconds as a solution since time cannot be negative and determine that $t \approx 4.94$ seconds is the reasonable solution. The human cannonball (you!) will safely land on the ground in 4.94 seconds.

- c) Here is the parabola graphed from <https://www.desmos.com/calculator/pfdwlq5qht>



- d) Looking at the parabola on the graph, it looks like the vertex is at about (2.2, 108).
- e) The x-intercepts are (-0.25, 0) and (4.94, 0) from my calculation and also see how the graph. This is how long it will take for the human cannon ball to safely land back on the ground, height = 0 feet. The vertex shows how HIGH the human cannonball will fly! Wow, looks like I will fly about 108 feet up!!