

Homefun 3

Duck!

MATH 150
15 points

Directions: Work in groups of 2 to 4 in class and then finish outside of class as necessary. Each group should submit **ONE** solution page for the group. (Be sure everyone's name is on it!)

A falling object has a height h at time t given by $h(t) = -\frac{1}{2}at^2 + v_0t + h_0$, where h is in meters, t is in seconds, a is the acceleration due to gravity, and v_0 and h_0 are the initial velocity and height of the object, respectively.

An astronaut on the moon throws a stuffed duck downward at 3 m/s from the edge of a crater 60 m deep.

1. Look up the acceleration due to gravity on the moon.
2. What is the function $h(t)$? Assume that $h = 0$ at the bottom of the crater.
3. For $t \geq 0$, show that h is one-to-one (and therefore has an inverse). [Hint: the graph is a parabola. Where is its vertex?]
4. Find the inverse of h . What does it represent?
5. After how many seconds is the stuffed duck 15m above the crater floor?