Homefun 6
Deep Thoughts

MATH 150
15 points

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

The speed s (in m/s) of a tsunami wave depends on the depth d of the water (in m): $s = \sqrt{9.8d}$.[1]

1. Use the definition of the derivative to determine the rate of change in speed with respect to depth, $\frac{ds}{dd}$ or $s'(d)$, when the depth is 100m.
2. Without evaluating the function, what would you expect the speed to be when the depth is 101m? 99m? Why? Now evaluate $s(101)$ and compare to your expectation.
3. Would your method work well to estimate $s(150)$? Why or why not?
4. Draw a sketch of the graph of s along with a tangent line at $d = 100$. What is the slope of that tangent line?

[1] `http://www.tulane.edu/~sanelson/Natural_Disasters/tsunami.htm`