NAME: _____ **Panther ID:** _____

Worksheet Aug. 24 - MAC 2311, Fall 2015

1) Assume you are driving along the turnpike.

(a) At 9am, you are at mile marker 20. At 12noon, you are at mile marker 240. What has been your average velocity between 9am and 12noon?

(b) Now assume that t hours after 9am, you are at mile marker $s(t)$. How would you compute your average velocity over the time interval $[t_1, t_2]$?

(c) Should your instantaneous velocity during the time interval $[t_1, t_2]$ always equal to the average velocity?

2) Let $s(t) = -16t^2 + 96t$ be the height (in feet) of a stone above the ground t seconds after it is thrown upwards.

(a) Compute the average velocity of the stone in the first two seconds.

(b) Sketch the graph of the function $s(t) = -16t^2 + 96t$.

(c) On this graph, give a geometric interpretation of the average velocity you computed.

(d) What is the average velocity in the first tenth of a second?

(e) What is the average velocity over the interval $[0, h]$?

(f) What happens to this average velocity over the interval $[0, h]$ as h gets closer to zero? Can you think of a meaning for this "limit" as h goes to zero?

(g) Can you do this computation for average velocities over intervals $[t_0, t_0 + h]$? What would the limit of this average velocity as h goes to zero represent?