Secants and Tangents

These exercises accompany the Java applet "Army vs. Navy: The Long Trip"

We will use the applet to investigate the relationship between secants and a tangent, and average velocity and instantaneous velocity.

Set t_1 at 3.5, t_0 at 0.5, and use the applet to generate a numerical solution for the slope of the secant lines/average velocities as t_0 is increased by 0.5 to 3.5.

t_0	**slope of secant/average velocity (mph)**
0.5	
1.0	
1.5	
2.0	
2.5	
3.0	
3.5	

Table 1: The average velocities as t_0 approaches t_1.

What is the relationship between the slope of the secant line and average velocity in this situation?

Describe what happens to the slope of the secant lines as t_0 approaches t_1.

What is the relationship between the limiting value of the slopes of secant lines and a tangent line, and the limiting value of average velocities and instantaneous velocity?