Professor Fred Katiraie Calculus I; Quiz Six

Name:_____ Due Date: 7/11ᵗʰ/06

1. A kite is flying 100 feet above the ground at the end of a string 125 feet long. The girl flying the kite lets out the string at a rate of 1 foot per second. If the kite remains 100 feet above the ground, how fast is its horizontal distance from the girl increasing?

2. A student 5 feet tall is 10 feet away from a lamppost 15 feet tall. She is walking away from the lamppost at 2 feet per second. How fast is the tip of her shadow moving away from the foot of the lamppost?

3. A frugal young man has decided to extract one of his teeth by tying a stout rubber band from his tooth to the chain on a garage door opener which runs on a horizontal track 3 feet above his mouth. If the garage door opener moves the chain at $\frac{1}{4}$ ft/sec, how fast is the rubber band expanding when it is stretched to a length of 5 feet?

4.	Two straight roads intersect at right angles in Newtonville. Car A is on one road moving toward the intersection at a speed of 50 miles/hour. Car B is on the other road moving away from the intersection at a speed of 30 miles/hour. When car A is 2 miles from the intersection and car B is 4 miles from the intersection, how fast is the distance between the cars changing?

5.	If the diagonal of a square increases at the rate of 1 inch/second, how fast is the area changing when the side of the square is 13 inches?

6.	A piece of land is shaped like a right triangle. Two people start at the right angle at the same time, and walk at the same speed along different legs of the triangle while spraying the land. If the area covered is changing at 8 square meters per second, how fast are the people moving when they are 4 meters from the right angle? (Round approximations to two decimal places.)

7.	A man 6 ft tall walks at a rate of 1.5 ft/s away from a lamppost that is 25 ft high. At what rate is the length of his shadow changing when he is 60 ft away from the lamppost?