2/22/2006	MATH261 Calculus I	Name:
Dr. Lunsford	Quiz 5	(20 Points Total)

An ant crawls along a yardstick. When Dr. L. starts observing the ant, it is at the 16 inch mark on the yardstick (we will consider this as time x = 0). Suppose the ant's position on the yardstick is given by the function $f(x) = 16 - x^2$ where f(x) is in inches and x is in seconds. A graph of the ant's position versus time is given below. Please answer the following questions.

(a) Find the slope of the secant line from x = 1 to x = 3 seconds. Graph this line on the graph of the position function to your right. Clearly indicate your answer on the graph. (3 points)

(b) Explain the meaning of the slope of the secant line you found in part (a) in the context of this problem. (2 points)



(c) Find the velocity of the ant at time x = 1 second (you must use one of the limit definitions of the derivative at a point). (4 points)

(d) Find the equation of the line whose slope is the velocity you found in part (c). Accurately graph this line on the graph of the position function above and clearly indicate your answer on the graph. (4 points)

(e) Use the limit definition of the derivative to find f'(x), the derivative function of f(x). (5 points)

(f) At what time will the ant walk off the yardstick? (2 points)