Pledge:

3/31/2009 MATH261 Calculus I Name:_____
Dr. Lunsford Quiz 10 (20 Points Total)

I. Find the indicated limits. You must show at least one intermediate step for full credit. (3 points each, 9 total)

(a) $\lim_{x\to 0}\dfrac{x^2+\sin(3x)}{x}$

(b) $\lim_{w\to\infty} w\tan\left(\dfrac{4}{w}\right)$

(c) $\lim_{t\to 0}\dfrac{t\cos t}{e^{2t}}$

II. A plane flying horizontally above the ground with constant speed of 300 km/h passes over a ground radar station at an altitude of 1 km. At what rate is the distance from the plane to the radar station increasing one minute later? Hint: Let x be the distance from the plane to the radar station and y be the horizontal distance of the plane to the radar station (both in km). In the drawing below $x=1$ km and $y=0$ km. Please answer the following questions. (11 points total)

(a) Draw the picture on the right at a later time. Be sure to clearly label all variables on your picture. (2 points)

(b) Please state your goal for this problem in terms of the variables x and y. (2 points)

(c) Please state what you are given in terms of the variables x and y. (2 points)

(d) Find a relationship between the variables x and y that holds for all time of interest for this problem. (2 points)

(e) Solve the problem. Clearly indicate your answer. (3 points)