Quiz 6
Math 251

Name:

1. [2] TRUE/FALSE: Circle T in each of the following cases if the statement is *always* true. Otherwise, circle F. Let f be a function.

   T F If $f'(c) = 0$, then f has a local maximum or minimum at c.

   T F If f is continuous on (a, b), then f attains an absolute maximum value $f(c)$ and an absolute minimum calue $f(d)$ at some numbers c and d in (a, b).

Show your work for the following problems. The correct answer with no supporting work will receive NO credit (this includes multiple choice questions).

2. [4] Find the following:

$$\lim_{x\to 0} \frac{x + \sin x}{x + \cos x} \qquad \lim_{t\to 0} \frac{5^t - 3^t}{t}$$

3. [4] Consider the function $g(x) = 1 + 2x + x^3 + 4x^5$

   (a) Show that g has at least one root. Explain your reasoning clearly and *cite* and theorems you use.

   (b) Show that g has at most one root. Explain your reasoning clearly and *cite* and theorems you use.