Math 126B **Calculus With Analytic Geometry III** **Fall 1995**

QUIZ #8 ANSWERS

11/16/95

Suppose $T(p,q)$ is the function

$$T(p,q) = \frac{p}{q+1}.$$

1. Compute the differential dT in terms of dp and dq at the point where $p = 3$ and $q = 2$.

$$dT = \boxed{\tfrac{1}{3}dp - \tfrac{1}{3}dq}$$

2. Suppose the values $p = 2$ and $q = 3$ are known to be accurate to within ± 0.1. Use the differential to *estimate* the maximum (absolute) error in T that could be caused by errors in the values of p and q.

$$\text{Maximum error in } T = \boxed{\tfrac{1}{4}(0.1) + \tfrac{1}{8}(0.1) = \tfrac{3}{80} = .0375}$$

NOTE: There was a typo in the statement of Problem 2 above: I intended for the values to read $p = 3$ and $q = 2$ as in Problem 1, not the other way around. If you misread the second problem and thought it was referring to the same p and q values as the first, it's an understandable error; therefore, we'll also accept the following as a correct answer:

$$\text{Maximum error in } T = \boxed{\tfrac{1}{3}(0.1) + \tfrac{1}{3}(0.1) = \tfrac{1}{15} \approx 0.067}$$