640:251:01-03 **Quiz** **2/19/97**

1. Suppose $z = \dfrac{x^2 y}{y+1}$. Compute $\dfrac{\partial z}{\partial x}$ and $\dfrac{\partial z}{\partial y}$.

2. If $F(x,y) = \dfrac{10x^2 + y^2}{x^2 - 7y^2}$, then:

a) Compute both $\lim\limits_{x \to 0} F(x,0)$ and $\lim\limits_{y \to 0} F(0,y)$.

b) Does $\lim\limits_{(x,y) \to (0,0)} F(x,y)$ exist? Explain your answer briefly.

3. If $G(s,t) = te^{s-t}$, compute $\dfrac{\partial^2 G}{\partial s^2} + \dfrac{\partial^2 G}{\partial t^2}$.

4. Suppose $H(x,y) = f(x^2 + y)$ where f is an unknown differentiable function of one variable. Compute $\dfrac{\partial H}{\partial x} - 2x\dfrac{\partial H}{\partial y}$.