

Last Name: _____

First Name: _____

Student ID: _____

Quiz 8

Question 1. (5 marks) Find the linearization $L(x,y)$ of the following function at $(0,3)$.

$$f(x,y) = y + \sin(x/y)$$

Question 2. (5 marks) Use the chain rule to find $\frac{\partial u}{\partial \alpha}$, $\frac{\partial u}{\partial \beta}$, and $\frac{\partial u}{\partial \gamma}$ when $\alpha = -1$, $\beta = 2$, and $\gamma = 1$, given $u = xe^{ty}$, $x = \alpha^2\beta$, $y = \beta^2\gamma$ and $t = \gamma^2\alpha$.

Question 3. (5 marks) Find the directional derivative in the direction of the vector $\mathbf{v} = \langle 5, 10 \rangle$ of the function $f(r, s) = \arctan(rs)$ at the point $(2, 1)$.