

MATH 241 Spring, 2010 Quiz #5 Name: _____

For full credit you must show sufficient work that the method of obtaining your answer is clear. There is no need to “simplify” answers.

1. The function $z = f(x, y) = \tan^{-1}(xy)$ is defined everywhere on the (x, y) -plane except along the x and y -axes.

a. Compute $\text{grad } f = \vec{\nabla} f$.

b. Compute $\frac{\partial^2 z}{\partial x \partial y} = f_{yx}$; then give $\frac{\partial^2 z}{\partial y \partial x} = f_{xy}$.

2. Compute $\frac{\partial z}{\partial t}$ in terms of x , y , s , and t if $z = xy^2 \sin x$, $x = st^3$, and $y = s^4 t$.