Math 2110Q - Multivariable Calculus **Section 14.3 Worksheet**
Name:

1. Find the first partial of the following
   - $z = (2x + 3y)^{10}$
   - $f(x, y) = \frac{x}{(x+y)^2}$

2. Find $f_x(2, 3)$ for $f(x, y) = \tan^{-1}\left(\frac{y}{x}\right)$.

3. Find $f_x(2, 1, -1)$ for $f(x, y, z) = \frac{y}{x+y+z}$.

4. Use implicit differentiation to find $\frac{\partial z}{\partial x}$ and $\frac{\partial z}{\partial y}$ of $x^2 + 2y^2 + 3z^2 = 1$.

5. Find all second partials of $f(x, y) = x^3y^5 + 2x^4y$.