Math 2110Q - Multivariable Calculus **Section 14.4-14.5 Worksheet**
Name:

1. Find an equation of the tangent plane to the surface $z = \frac{x}{y^2}$ at the point $(-4, 2, 1)$.

2. Explain why the function is differentiable at the given point. Then find the linearization $L(x, y)$ of the function at that point.

$$f(x, y) = 1 + x \ln(xy - 5), \quad (2, 3)$$

3. Use the chain rule to find $\frac{dz}{dt}$ for

$$z = fracx - yx + 2y,\ x = t^2,\ y = 2t - 1.$$

4. Find $\frac{dz}{dt}$ of the above function by first substituting for x and y in the equation of z.

5. Use the chain rule to compute $\dfrac{\partial z}{\partial u}$ where

$$z = x^4 + x^2y,\ \ x = s + 2t - u,\ \ y = stu^2$$

when $s = 4,\ t = 2,\ u = 1$.