NAME:

**Quiz 2b; Math 225**

This exam is a closed book, no notes, no "crib sheets" quiz. Calculators are permitted. There are five problems on this quiz. Good luck!

1. (4 points) Given the function $f(x, y) = y^3 \ln(1 + x^2 + y^2)$, compute $\frac{\partial f}{\partial x}$ and $\frac{\partial f}{\partial y}$.

2. (4 points) If $f(x, y, z) = 2z^2 \cos(x - y) - e^{xz}$, compute $f_{xz}(x, y)$.

3. (4 points) Use the chain rule to compute the partial derivatives $\frac{\partial z}{\partial s}$ and $\frac{\partial z}{\partial t}$ if $z = \ln(xy^2)$ and $x = s - t$, $y = e^{2s+t}$.

4. Compute the directional derivative of the function $f(x, y) = \sqrt{x^2 + y^2}$ in the direction of the unit vector $\mathbf{u} = \langle 3/5, -4/5 \rangle$.

5. Compute the equation for the tangent plane to the graph of $f(x, y) = (x + y)/(x - y)$ at the point $(2, 1, 3)$.