Name: _____

Please write clearly and show all of your work.

1. Suppose that $f(x, y) = x^2y - 3yx + 5y^3$. Find all first and second partial derivatives of f.

2. Suppose that $z = x^3y + \sin(x + y) - 3\cos(xy)$, that $x = t^2 - s$ and that $y = 2st$. Use the Chain Rule to find $\frac{\partial z}{\partial t}$.