NAME: (print!) Daniel Gameiro   **Section:** 23

E-MAIL SCANNED .pdf OF COMPLETED QUIZ to DrZcalc3@gmail.com (Attachment: q9FirstLast.pdf) ASAP BUT NO LATER THAN Oct. 5, 8:00pm

1. Find $\frac{\partial f}{\partial r}$ and $\frac{\partial f}{\partial s}$ as **functions of** r **and** s , if

$$f(x,y) = x^2 + 2xy^2 + 2y^3 \quad ,$$

and the variables are related by $x = r + 2s$ and $y = 3r + 2s$. You do not need to simplify!

$$\frac{df}{dx} = 2x + 2y^2 \qquad \frac{df}{dy} = 4xy + 6y^2$$

$$\frac{dx}{dr} = 1 \qquad \frac{dx}{ds} = 2 \qquad \frac{dy}{dr} = 3 \qquad \frac{dy}{ds} = 2$$

$$\frac{df}{dr} = \left(2(r+2s) + 2(3r+2s)^2\right) \cdot 1 + \left(4(r+2s)(3r+2s) + 6(3r+2s)^2\right) \cdot 3$$

$$\frac{df}{ds} = \left(2(r+2s) + 2(3r+2s)^2\right) \cdot 2 + \left(4(r+2s)(3r+2s) + 6(3r+2s)^2\right) \cdot 2$$

2. Find $\frac{\partial z}{\partial x}$ and $\frac{\partial z}{\partial y}$ if

$$x^2 + y^2 + z^2 = 5xyz + 1 \quad .$$

$$2x + 2z \cdot \frac{dz}{dx} = 5yz + 5xy \cdot \frac{dz}{dx}$$

$$\frac{dz}{dx}(2z - 5xy) = 5yz - 2x \qquad \frac{dz}{dx} = \frac{5yz - 2x}{2z - 5xy}$$

$$2y + 2z\frac{dz}{dy} = 5xz + 5xy\frac{dz}{dy}$$

$$\frac{dz}{dy}(2z - 5xy) = 5xz - 2y \qquad \frac{dz}{dy} = \frac{5xy - 2y}{2z - 5xy}$$