Wenhao Li $22, 23, 24$

NAME: (print!) _____   **Section:** _____

E-MAIL SCANNED .pdf OF COMPLETED QUIZ to DrZcalc3@gmail.com (Attach-ment: 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!

```
df/dx*dx/dr+df/dy*dy/dr=(2x+2y^2)*1+(4xy+6y^2)*3
df/dx*dx/ds+df/dy*dy/ds=(2x+2y^2)*2+(4xy+6y^2)*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+2zz'=(5y)(xz)'
2x+2zz'=(5y)(z+xz')
2x+2zz'=5yz+5xyz'
2zz'-5xyz'=5yz-2x
z'(2z-5xy)=5yz-2x
z'=(5yz-2x)/(2z-5xy)

2y+2zz'=(5x)(yz)'
2y+2zz'=(5x)(z+yz')
2x+2zz'=5xz+5xyz'
2zz'-5xyz'=5xz-2x
z'(2z-5xy)=5xz-2x
z'=(5xz-2x)/(2z-5xy)
```