Math2210 Quiz 7 (Sections 12.5-12.7) Summer, 2008 Dylan Zwick

Name _____ Date _____

Instructions: Please show all of your work as partial credit will be given where appropriate, **and** there may be no credit given for problems where there is no work shown. All answers should be completely simplified, unless otherwise stated.

1. *(8 points)* Find the directional derivative of $f(x,y)=3x^2-2xy+5y^2$ at $\boldsymbol{p}=(3,1)$ in the direction of $\boldsymbol{a}=2\boldsymbol{i}-\boldsymbol{j}$.

Answer : _____

2. *(8 points)* In what direction $\boldsymbol{u}$ does $f(x,y)=4-x^2y^2+e^{2x}-3y$ increase most rapidly at $\boldsymbol{p}=(0,3)$?

Answer: _____

3. *(8 points)* Find $\frac{\partial z}{\partial x}$ given $F(x,y,z)=2x^2z-y^4-xyz^2=0$.

Answer: _____

4. *(8 points)* Find $\frac{\partial w}{\partial t}$ for $w=e^{xy+z}$ given $x=s+t$, $y=s-t$ and $z=t^2$.

Answer: _____

5. *(8 points)* Find the equation of the tangent plane to $3x^2+y^2+3z^2=9$ at $(1,0,\sqrt{2})$.

Answer : _____