**Math2210  Quiz 6** (Sections 12.2-12.4)          Summer, 2008          Dylan Zwick

Name _____ Date _____

<u>Instructions</u>:  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.  *(10 points)* Find the slope of the tangent to the curve of intersection of the surface

$z = \frac{1}{2}\sqrt{9x^2 + 9y^2 - 36}$  and the plane  $y = 1$  at the point  $\left(2, 1, \frac{3}{2}\right)$ .

slope = _____

2.  *(5 points each)* Find the limit (or show that it does not exist).

(a)  $\displaystyle\lim_{(x,y)\to(0,0)} \frac{\sin(x^2 + y^2)}{-3x^2 - 3y^2}$ .

Answer : _____

(b)  $\displaystyle\lim_{(x,y)\to(0,0)} \frac{4xy}{x^2 + y^2}$

Answer: _____

3. *(10 points)* Find the gradient of f, $\nabla f$ , for $f(x,y)=\dfrac{-4x^3y-x}{y^2}$

$\nabla f$ =_____

4. *(10 points)* Find the equation of the tangent plane to $f(x,y)=y+2\text{xy}-6x^3y^2$ at $p_o=(1,1)$ .

Tangent Plane : _____