Name: ID #: Section #:

Q1) [**2.5pts**] Find $\lim\limits_{(x,y)\to(0,0)} \dfrac{xy\cos y}{3x^2+y^2}$, if it exists, or show that the limit does not exist.

Solution:

Q2) [**2.5pts**] If $w = \dfrac{x}{y+2z}$, find $\dfrac{\partial^3 w}{\partial z \partial y \partial x}$ and $\dfrac{\partial^3 w}{\partial x^2 \partial y}$.

Solution:

Q3) [**2.5pts**] Find an equation of the tangent plane to the surface $z = y\ln x$ at the point $(1, 4, 0)$.

Solution:

Q4) [**2.5pts**] Let $M = xe^{y-z^2},\ x = 2uv,\ y = u - v,\ z = u + v$. Find $\dfrac{\partial M}{\partial u}$ and $\dfrac{\partial M}{\partial v}$ when $u = 3$ and $v = -1$.

Solution:

Name: ID #: Section #:

Q1) [**3pts**] Determine the set of point at which the function is continuous:

$$f(x,y) = \begin{cases} \frac{x^2y^3}{2x^2+y^2}, & (x,y) \neq (0,0) \\ 1, & (x,y) = (0,0) \end{cases}$$

Solution:

Q2) [**2pts**] Find all second partial derivatives of $v = \dfrac{xy}{x-y}$.

Solution:

Q3) [**3pts**] Find linearization $L(x,y)$ of $f(x,y) = \sqrt{x+e^{4y}}$ at the point $(3,0)$.

Solution:

Q3) [**2pts**] If $yz = \ln(x+z)$, find $\dfrac{\partial z}{\partial x}$ and $\dfrac{\partial z}{\partial y}$.

Solution: