MATH 211- EXAM II -OCTOBER 20, 2004

1)Determine for the planes x-y-z=1 and 2x+3y-z=5

a)The equation of the line of intersection
b)The angle between the two planes

2)Determine for the position vector $\mathbf{R} = (t^2 + 1)\mathbf{i} + t^3\mathbf{j} + (t - 2)\mathbf{k}$,
a)The acceleration vector at t=1
b)The equation of the plane containing the acceleration and velocity vectors at t=1

3)Evaluate the limits if they exist (show all work)

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

b) $\lim_{(x,y)\to(0.0)} \frac{xy}{4x^2+4y^2}$

c) $\lim_{(x,y)\to(0,0)} \frac{y}{x^2+y}$

4)For the function $z = x + \ln y + xy^2 \cos x$
Evaluate at the point $(\frac{\pi}{2}, 2)$

a) $\frac{\partial z}{\partial x}$
b) $\frac{\partial^2 z}{\partial x \partial y}$
c) $\frac{\partial^3 z}{\partial x \partial y^2}$

5)Determine the local extrema locations (critical points) for

a) $z = xy^2 + \frac{x^2}{2} + y^2 + 10$
b) $z = 2(x + 1)^2 + 3(y - 2)^2 + 6(y-2)$

6)Determine, using the chain rule, for $w = xe^z + zy$

a) $\frac{dw}{dt}$ at t=1, where x=$\frac{1}{t}$, y=t^3 and z=t-1
b) $\frac{\partial w}{\partial v}$ at u=1 and v=1, where x=u^2+v , y=uv^2 , z=$v^2 - u^2$