Math 2443-006   Quiz I   Name: SOLNS .

Q1].. Consider the surface $z = y\cos(x - y)$.

(a) Compute the partial derivatives

$$\frac{\partial z}{\partial x} \quad \text{and} \quad \frac{\partial z}{\partial y}$$

$$\frac{\partial z}{\partial x} = -y\sin(x-y)\frac{\partial(x-y)}{\partial x} = -y\sin(x-y)$$

$$\frac{\partial z}{\partial y} = \frac{\partial y}{\partial y}\cos(x-y) - y\sin(x-y)\frac{\partial(x-y)}{\partial y}$$

$$= \cos(x-y) + y\sin(x-y)$$

$\downarrow f_y(2,2) = 1$

$f_x(2,2) = 0$

(b) Find the equation of the tangent plane to this surface at the point $(2, 2, 2)$.

$$z - z_0 = f_x(x_0, y_0)(x - x_0) + f_y(x_0, y_0)(y - y_0)$$

$$x_0 = 2, \quad y_0 = 2, \quad z_0 = 2$$

$$z - 2 = 0(x-2) + 1(y-2)$$

$$\boxed{z = y}$$