QUIZ 6

1. Find an equation for the plane tangent to the unit sphere at the point $(1/\sqrt{3}, 1/\sqrt{3}, 1/\sqrt{3})$.

soln: surface takes the form $g(x,y,z) = c$ where $g(x,y,z) = x^2+y^2+z^2$ & $c = 1$.

$$0 = \nabla g(x_0,y_0,z_0) \cdot (x-x_0, y-y_0, z-z_0)$$

$$= (2x_0, 2y_0, 2z_0) \cdot (x-x_0, y-y_0, z-z_0)$$

$$= \frac{2}{\sqrt{3}}(x-1/\sqrt{3}) + \frac{2}{\sqrt{3}}(y-1/\sqrt{3}) + \frac{2}{\sqrt{3}}(z-1/\sqrt{3}). \quad //$$

2. Find the directional derivative of $f(x,y) = x^2+y^2$ at the point $(1,1)$ in the direction $(1,0)$.

soln: This is just $f_x(1,1) = 2$. //