Quiz 2 **Calculus 3** **9/21/2007**

Each problem is worth 5 points. Clear and complete justification is required for full credit.

1. Let $f(x,y)=\sqrt{x^2+y^2}$. Find f_x and f_y.

$(x^2+y^2)^{1/2}$

$f_x(x,y) = \frac{1}{2}(x^2+y^2)^{-1/2}(2x) = \frac{x}{\sqrt{x^2+y^2}}$

Great!

$f_y(x,y) = \frac{1}{2}(x^2+y^2)^{-1/2}(2y) = \frac{y}{\sqrt{x^2+y^2}}$

2. Let $z = y \ln x$. Find an equation for the plane tangent to this surface at the point (1, 3, 0).

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

$f_x(x,y) = \frac{y}{x}$ $\quad f_x(1,3) = \frac{3}{1} = 3$

$f_y(x,y) = \ln x$ $\quad f_y(1,3) = \ln 1 = 0$

$z - 0 = 3(x-1) + 0(y-3)$

$z = 3x - 3$

Excellent!