

Quiz 2-20-25

①

3 pts

State the domain of $f(x,y) = \sqrt{64-x^2-y^2}$.

ANS: $\{(x,y) \mid x^2+y^2 \leq 64\}$ ← ANY form ok

②

3 pts

Let $f(x,y) = \int_x^y \sqrt{t^2+1} dt$. Find $\frac{\partial f}{\partial x}$ and $\frac{\partial f}{\partial y}$.

ANS: $\frac{\partial f}{\partial x} = -\sqrt{x^2+1}$ $\frac{\partial f}{\partial y} = \sqrt{y^2+1}$

③

4 pts

Let $g(x,y) = x^2 y^4$. Find the equation of the tangent plane to g at $x_0=3$, $y_0=2$.

ANS: $\vec{n} = \langle g_x, g_y, -1 \rangle = \langle 2xy^4, 4x^2y^3, -1 \rangle$
 $\Rightarrow \langle 2(3)(2)^4, 4(3)^2(2)^3, -1 \rangle$
 $\Rightarrow \langle 96, 288, -1 \rangle$

point: $(3, 2, 144)$

$\rightarrow 96(x-3) + 288(y-2) - (z-144) = 0$

or
 $96x + 288y - z = 720$

or
 $z = 96x + 288y - 720$

} any is fine.