

REVIEW 2

1. A surface is given by equation $xyz + x + y + e^z = 2$. Find an equation of the tangent plane to the surface at point $(2, -1, 0)$.
2. Given $f(x, y) = e^{x^2+y^2}$, $x = u \sin v$, and $y = u \cos v$, use a chain rule to find $\frac{\partial f}{\partial u}$ and $\frac{\partial f}{\partial v}$.
3. Find all the second partial derivatives of the function $f(x, y) = \sqrt{x^2 - y^5}$.
4. Find all the critical points of the function $f(x, y) = xy e^{x-2y}$ and classify them as local maxima, minima, saddle point(s), or none of these.
5. Find the largest and smallest values of $2x^3 + 4y^2$ subject to the constraint $x^2 + 4y^2 \leq 4$.
6. Find the integral $\int_R (2y-x) dA$ over the region R on the xy -plane defined by the inequalities $0 \leq x \leq 1$ and $0 \leq y \leq 2 - x$.