Name (Please Print) _____ Rec. Instr.

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Your Signature _____ Class Time _____

ANALYTIC GEOMETRY AND CALCULUS III
Exam III
April 13, 1995

(16) 1. Find an equation for the tangent plane to the surface $xyz^3 + yz^2 = 4$ at the point $P_0 = (1, 2, 1)$.

Answer _____

(16) 2. What does it mean to say that $f(x, y) = xe^y$ is differentiable at $P_0 = (1, 0)$?

(18) 3. What is the precise rate of change of $f(x, y, z) = x^3 e^y + xz$ at $P_0 = (4, 0, 16)$ in the direction toward $P_1 = (2, 1, 4)$?

Answer _____

(18) 4. Let $f(x, y) = 3x^2 - 2xy + 5y^2$. Find and classify the critical points of f.

(16) 5. Evaluate $\int_{-1}^{1}\int_{0}^{y} xye^{x^2}dxdy$.

Answer _____

(16) 6. Express the double integral of $f(x, y) = xy^2 + x^2$ over the region D bounded by the curves $y = x^2$ and $x = y^2$ as an iterated integral.