

Show all work. 5 points each.

1. Find the critical points of $f(x, y) = x^3 - 12xy + 8y^3$ and use the second derivative test to determine if they are local max, local min or saddlepoints.

2. **SET UP** the Lagrange multiplier system of equations to maximize $f(x, y, z) = xyz$ subject to the constraint $x^2 + 2y^2 + 3z^2 = 6$.