

Quiz 6 - Math 53
October 16, 2008

Name _____

1a)[3pts] Consider the function $f(x, y) = x^3 + y^3$ on the domain $x^4 + y^4 \leq 2$. Which points in the *interior* of the domain are candidates to be maxima or minima? For each of these points, what does the second derivative test tell you?

1b)[3pts] Use Lagrange multipliers to determine which points on this boundary $x^4 + y^4 = 2$ can be minima or maxima of the function $f(x, y) = x^3 + y^3$. Evaluate f at these points and any candidate points from part (a) to determine the maximum and minimum values of f .

2)[3pts] Use Lagrange multipliers to determine which point on the surface $z = x^2 + y^2$ is closest to the point $(3, 3, 1)$. (Hint: solve for x , y , and z in terms of λ and try guessing $\lambda = -2$.)