

Name: \_\_\_\_\_ MATH 210 Quiz 6 (Oct 14, 2005) no calculators!

(1) Let  $f(x, y, z) = 1 + x^2 + y^3 + z^5$ . You would like to find the maximum value  $f_{max}$  of the function  $f$  on the ellipsoid  $x^2 + 2y^2 + 3z^3 = 2$  using Lagrange multipliers.

Set up the system of equations to do this. (Do not solve!!!)

Suppose you have the solution(s) to the system above, what would you do to find  $f_{max}$ ?

(2) Your goal is to find a point on the intersection of the paraboloid  $z = x^2 + y^2$  and a sphere  $(x - 1)^2 + y^2 + z^2 = 5$  that is **the closest to the origin**.

Use Lagrange multipliers to set up the system. (Solve not!!!)