Exercise: Lagrange Multiplier
Math 212

Name: Total Score: 10 pts

1. Find the shortest distance from the origin $(0,0)$ to the hyperbola $x^2 + 8xy + 7y^2 = 225$.

2. Find the points on the surface $xy^2z^3 = 2$ that are closest to the origin.

3. A package in the shape of a rectangular box can be mailed by the US Postal Service if the sum of its length and girth (the perimeter of a cross-section perpendicular to the length) is at most 108 in. Find the dimensions of the package with largest volume that can be mailed.