Math 20550 Calculus III Tutorial **Name:** _____
February 26, 2015

Tutorial Worksheet

Show all your work.

1. Find the tangent plane and the normal line to the surface $x^2y + xz^2 = 2y^2z$ at the point $P(1, 1, 1)$.

2. Find the local maxima, minima, and saddle points of the function $z = x^3 + y^3 - 3xy + 1$.

3. Identify the maximum and minimum values attained by $z = x^2y - 2x^2$ within the triangle T bounded by the points $P(0,0)$, $Q(2,0)$, and $R(0,4)$.

4. Identify the maximum and minimum values attained by $z = 4x^2 - y^2 + 1$ within the region R bounded by the curve $4x^2 + y^2 = 16$.