

Math 1451, Honor Calculus Practice 7, Spring 2016.

March 7, 2016

PSID: \_\_\_\_\_ Name: \_\_\_\_\_

1. Find the rate of change of  $f(x, y) = xe^y$  at the point  $P(2, 0)$  in the direction from  $P$  to point  $Q(\frac{1}{2}, 2)$ .

2. Find the local maximum and minimum values and saddle points of  $f(x, y) = x^4 + y^4 - 4xy + 1$ .

3. Find extreme values of the function  $f(x, y) = x^2 + 2y^2$  on the circle  $x^2 + y^2 = 1$ .

4. Maximize the function  $f(x, y, z) = x + 2y + 3z$  subject to the constraint  $x - y + z = 1$  and  $x^2 + y^2 = 1$ .