Math. 302-01
Spring, 2005
R. B. Kearfott

Fourth Examination
Friday, March 11, 2005

Instructions: This exam should be done on your own paper. Your name should be on each sheet and on the back of the last sheet; the answers should appear written carefully and in order. If in doubt, show intermediate steps: Full credit may not be given, even for correct answers, unless work is arranged clearly and explained. This exam is closed book. You may leave after handing in your exam paper, but be sure to check your answers carefully. You may keep this exam sheet. Each entire problem is worth 50 points.

1. Find the maximum and minimum values of
$$f(x, y) = x^2 - 2x + y^2 + 2y + 2$$
subject to
$$g(x, y) = x^2 + y^2 \le 4.$$

2. Find and classify all critical points of
$$f(x, y) = \frac{x^3}{3} - xy^2 + y^2.$$