

Math 203 — Second Derivative Test

Problem 1. Find all critical points of the following functions and use the Second Derivative Test to classify them.

a. $f(x, y) = \frac{1}{2}x^2 + 2y^2 - 8y + 4x$

b. $f(x, y) = 4 + x^3 + y^3 - 3xy$

c. $f(x, y) = x^2 + y^3 - 3y + 1$

Problem 2. Use CalcPlot3d to visualize the graphs and contour plots of the functions in Problem 1 and informally verify that your classifications of critical points are accurate.