

COMPUTER PROJECT 6

Local Extrema for a Function of 3 Variables

DUE: 01/07/2022

Instructions: Use *Mathematica* to solve the following problems. Email a copy of your finalized notebook to byoung@wyoingseminary.org with the subject "Computer Project 6."

For this project, consider the function

$$f(x, y, z) = (x^2 - 3xy + y^2 - 4yz + z^2) e^{-(x^2+y^2+z^2)}.$$

- 1.) Find all critical points for f (there should be 7 of them).
- 2.) Classify each critical point as a local maximum, local minimum, or saddle point using the eigenvalues of the Hessian matrix (the test should not be inconclusive for any of the critical points).