# Mathematics 550 Homework.

**Problem** 1. For some reinforcement about working with gradients and directional derivatives on page 82 of *Vector Calculus* do problems 11, 15, 19–26.

In doing the following max/min problems it is a very good idea to plot the function. An easy way to do this is to use Desmos

`https://www.desmos.com/3d`

**Problem** 2. For practice on finding critical points and local maxima and minima on page 88 of *Vector Calculus* do problems 1–6, and 11.

**Problem** 3. For the function

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

find the critical points and classify these as to being maximizers, minimizers, or saddle points.