Math 3298 Worksheet 19: extrema of multivariate functions

Group members (2 to 4): _____

(1) Minimize the distance from the origin to the surface given by $z^2 = 4xy + 1$.

(2) Suppose you are feeling lucky and decide to take a hike on the active volcano Mount St. Helens. You take the path indicated by the heavy ellipse on the contour (topographic) map below.

Indicate the location of your highest and lowest point, and sketch the gradient of the height function (the function whose contours are drawn; height is in meters) at those points.

Then pick a third point and draw the gradient of the height function there as well.