**ECE 595 Homework 3 Due: Feb. 28, 4 PM**

1. For the following function of two variables, find the stationary points, i.e., where the gradient is zero.



Which of the stationary points, if any, is the minimum?

1. For the function , find (a) the stationary points, and (b) the gradient at  in the direction of .
2. Find the minimum point for the function, ,

using the steepest descent algorithm with the initial guess of  and a learning rate of 0.1. Show a few iterations by hand calculations. Use MATLAB to verify your calculations. Show your code and final results.

1. For the function , perform two iterations of the **steepest descent** algorithm, starting at the initial guess of .
2. Determine the eigenvalues and eigenvectors for the following matrices.
3.  (b)  (c) 
4. For the function given in Problem 4, show an iteration of **Newton’s method** using the initial guess of  . Complete the solution in MATLAB. Compare the two algorithms for this problem.