Math 134 - Homework 5

1. (Based on Strogatz Exercise 3.6.2) Consider the system $\dot{x} = h + rx - x^2$. When $h = 0$, this system undergoes a transcritical bifurcation at $r = 0$.

   (a) Sketch the bifurcation diagram of x^* against r for $h < 0$, $h = 0$, and $h > 0$.

   (b) Sketch the bifurcation diagram of x^* against h for $r < 0$, $r = 0$, and $r > 0$.

2. Problem 3.5.8 in Strogatz.

3. Problems 4.3.3, 4.3.6, 4.3.4, 4.1.3, 4.1.5 and 4.1.6. We will cover the material needed to solve these problems by Wednesday.