

Chemistry 5850 Fall 2005 Assignment 3

Due: Monday, October 3.

Weight of this assignment: 20 marks

Consider the following set of differential equations:

$$\begin{aligned}\frac{dx}{dt} &= y, \\ \frac{dy}{dt} &= z, \\ \frac{dz}{dt} &= -az + y^2 - x.\end{aligned}$$

Carry out a linear stability analysis of the equilibrium point. Investigate the behavior of this system numerically. In your report, show as many different types of behavior as possible, and discuss the bifurcations you encounter.