

Assignment 6

due: Thursday, April 26, in class

Problem 1: Consider the system $\dot{x} = x - 3y$ and $\dot{y} = 0.25x + 3y$.

- a) Transform the system into one second order differential equation and find the (general) solution for x and y .
- b) Solve the system using eigenvalues and eigenvectors.

Problem 2: Consider the system $\dot{x} = x + 5y + 18$ and $\dot{y} = 0.25x - y + 9$.

- a) Find the general solution of this system.
- b) Find the particular solution for the initial conditions $x(0) = 6$ and $y(0) = 0$.

Problem 3: For both systems above

- a) Draw a phase diagram.
- b) Find all stationary points.
- c) Determine the nature of those stationary points.