

Homework 9

Math 469 (section 500), Spring 2019

This homework is due on Thursday, March 21 (the day of the exam).

0. (*This problem is not to be turned in.*) Section 4.12 #1

1. Read Sections 4.1–4.4. List all results and definitions from those sections that you did *not* see in your Differential Equations class.
2. Consider the following system of differential equations:

$$\begin{aligned}\frac{dx}{dt} &= xy - 25 \\ \frac{dy}{dt} &= x + y - 10\end{aligned}$$

- (a) Is the system autonomous or non-autonomous? Linear or nonlinear?
 - (b) Find all equilibria.
3. Solve the following initial-value problem:

$$\begin{aligned}\frac{dx}{dt} &= -\frac{x}{t} + e^{2t} \\ x(1) &= 3\end{aligned}$$