

Due October 6, 2010 5:00 PM

MTH 2140 Quiz 4

Instructions: This is a self-scheduled quiz. You can work for as long as you like, but you can't take breaks. You are not allowed to work in groups or discuss problems with other people and you are not allowed to use notes, books, web browsers, calculators, etc. Please place the quiz in my mailbox (in MH250) or in the box outside of my office (MH 257) sometime before Wednesday at 5 PM.

1. Determine the stability type (e.g. spiral source, saddle, etc.) for the equilibrium at the origin for the following linear systems

(a)
$$\begin{aligned}\dot{x} &= 3x - 4y \\ \dot{y} &= 2x - 3y\end{aligned}$$

(b)
$$\begin{aligned}\dot{x} &= 3x - 4y \\ \dot{y} &= 3x - 3y\end{aligned}$$

(c)
$$\begin{aligned}\dot{x} &= 3x - 4y \\ \dot{y} &= 4x - 4y\end{aligned}$$

2. Solve the initial value problem

$$\dot{Y} = AY; Y(0) = (2, -1)$$

where $A = \begin{pmatrix} 1 & -1 \\ 2 & 3 \end{pmatrix}$