Math 677. Fall 2009.
Homework #1.
Due Thursday 09/10/09 in class.

Solutions should represent individual work, with all necessary details. Only facts discussed in class or given in the main textbook can be used without proof. Only selected problems will be graded. No homework will be accepted after the due date has passed.

Part I. Complete the following exercises from "Diffential Equations and Dynamical Systems" by Perko, 3rd edition.

Problem Set 1: # 2, 3
Problem Set 2: # 3
Problem Set 3: # 4, 8
Problem Set 4: # 2, 4
Problem Set 5: # 1, 5

Part II. Prove the following properties of e^A:

(1) if A is diagonalizable, so is e^A
(2) if A is symmetric, then e^A is positive definite
(3) $\det(e^{At}) = e^{\mathrm{tr}A}$
(4) $e^{At} = T^{-1}e^{TAT^{-1}t}T$.