MATH 336: Homework #4

Due: Thursday, October 13, 2016

Solve the below problems concerning differential equations. A (possibly improper) subset of them will be graded. All calculations should be done analytically, unless marked with an (M). (M) problems require the use of MATLAB. ES denotes the online lecture notes.

1. (10 points) (ES, p.135, #2) Problem 2 in the ODE3 section in the notes (end of chapter 2).

2. (20 points) (ES, p.135, #3) Problem 3 in the ODE3 section in the notes (end of chapter 2). Note for part (b), you can just solve one of the three cases listed if you'd like.

3. (20 points) (ES, p.136, #6) Problem 6 in the ODE3 section in the notes (end of chapter 2).

4. (20 points) (ES, p.130, #1, parts (c) and (d)(i)) Problem 1 in the ODE2 section in the notes (end of chapter 2), **parts (c) and (d)(i) only**. *Hint:* For part (c), make sure you can apply the linearization theorem to the fully nonlinear model. An answer of "we can't determine" is sometimes okay, but you must justify it.

5. (30 points) (ES, p.130-131, #2, parts (b), (c), (d) and (e)) Problem 2 in the ODE2 section in the notes (end of chapter 2), **parts (b), (c), (d) and (e) only**.