

HW #2 (MATH 721)**Due: 2:30pm on WEDS, 28 Sep 2016**

Instructions: Please turn in a printed copy of your homework. Students are encouraged to **work together, ask the instructor for help, consult any available resources, and collaborate on problems via Piazza**. However, you must **write up your solutions based on your own understanding**. Supplementary electronic files (e.g. R scripts or wxMaxima files) should be emailed to the instructor as a single file (e.g. one R script, or multiple files in a ZIP file) prior to class with file name format LASTNAME-HWX.ZIP.

Exercises:

- 1) **3.7.1** (see pg 76)
- 2) **5.1.3-5.1.6**
- 3) **5.1.10**
- 4) **5.2.12**
- 5) **7.1.5**

Optional Exercises (only the above problems will count towards your assignment grade):

- 6) **3.7.3**
- 7) **3.7.4**
- 8) **3.7.6**
- 9) **5.1.11**
- 10) **5.2.2**
- 11) Find the x - and y -nullclines for the following system of equations, assuming all parameters are positive, and that state variables x and y are non-negative.

$$\begin{aligned}\frac{dx}{dt} &= r_x x - \alpha_x x^2 - \beta_{xy} x y \\ \frac{dy}{dt} &= r_y y - \alpha_y y^2 - \beta_{yx} y x\end{aligned}$$