MA 241 REVIEW SHEET FOR TEST 3

Look at the problems from in class and recitation.

- **3.1 Intro to Differential Equations**
  -Be able to determine if a function is a solution to a differential equation, to do problems with slope fields and Euler's method.
  -Know what an equilibrium solution is
  -Be able to draw a slope field using the method of isoclines
  -Examples p. 20 #1,3,6,7,9

- **3.2 Separable Equations**
  -Be able to do problems with Separable equations and orthogonal trajectories
  -Separable Equations WS
  -Orthogonal Trajectories WS
  -Examples p. 33 #3,5,6,7,9,10,15,18

- **3.3 Applications of Separable Equations**
  -Be able to do mixing problems, exponential growth and decay, newton's law of heating and cooling (I'll either give you the differential equation and have you derive it or I'll give you T(t)), the logistic model
  - Mixing Problems
  -Examples p. 51 #1,4,5,6,7,11,14

- **3.4 Second-Order Linear Homogeneous Differential Equations**
  -Know how to find solutions to the auxiliary equation of ay''+by'+cy=0 for all 3 cases.
  -Be able to solve initial and boundary value problems.
  - Examples p.71 #1-13 odd

- **3.5 Second-Order Linear Nonhomogeneous Differential Equations**
  -Be able to find the complementary solution
  -Find the particular solution using the Method of Undetermined Coefficients
  -Use the complementary and particular to find the general solution
  -know what to do if the complementary and the particular overlap
  -2nd Order WS
  - Examples p.81 #1, 3, 6, 13, 16

- **3.6 Applications of Second-Order Differential Equations**
  - Spring Problems: mx''+bx'+kx=0 (know the different types of damping)
  - mx''+bx'+kx=Fext
  -p. 101 # 1,3, and Spring worksheet
  - Series Problems: p. 101 #7, 9, 13