

242 - Differential Equations: Test 2 Study Guide

Henson - Summer 09

TEST 2 TOPICS:

**Make sure to know all derivative rules and integration techniques from Calc I and II.

One Compartment Systems:

1. Tank problems
2. Population growth - Malthusian model, logistic model, or regression analysis (uses calculator)
3. Heating and cooling problems - Either constant outside temp (easier sol.) or fluctuating outside temp (sine curve)

*Know how to compute K given the time constant

Newtonian Mechanics:

1. Falling object affected only by gravity and wind resistance.
2. Parachute problems

Approximating solutions to first order ODE's:

1. Improved Euler's method
2. Taylor's Method

Comments -

* Skip section 3.5

** The other approximation method from 3.7 (Runge Kutta method), is a programmable approximation technique. Since we do not assume programming knowledge, you will only be responsible for the Taylor's Method (which you can do by hand).

*** As stated in class, some formulas will be given. If you are unsure of a formula that may or may not be given, email me.

**** The course competency problem for Test 2 will be a saltwater tank problem.