

## 242 - Differential Equations: Test 3 Study Guide

Henson - Summer 09

### TEST 3 TOPICS:

1. Setting up mass-spring oscillator problems given damping, mass, etc.
2. Solving homogeneous MSO problems with no external forces,  $f(t) = 0$  ( $\leftarrow$  homogeneous)
3. Finding the general solutions to a DE using two known solutions found by the auxiliary equation. ( $c_1y_1 + c_2y_2$ )
4. Solving MSO problems where the roots of the auxiliary equation are complex.
5. Solving nonhomogeneous D.E.'s of a nice type (exponentials,  $\sin(t)$ ,  $\cos(t)$ , polynomials) - This uses the Method of Undetermined Coefficients
6. Solving nonhomogeneous D.E.'s using the table provided with combinations of basic force functions.
7. Finding extra solutions using the Superposition Principle
8. Finding the form of a solution using the Method of Undetermined Coefficients

\*Skip variation of parameters