Last update: Thu Oct 25 17:47:34 MDT 2007

/m333.fa07/handouts333/t2_333_A26/REVSTUFF/review_suggestions_2_tex

1 This list is now in final form.

2 Test #2 is

Friday
10/26/07.

3 The test will cover the material of Assignments #8 – #13 and ____. See also the topic list below.

4 I have jettisoned the spring-mass problems to keep the exam length down.

5 You must have a simple scientific calculator for the exam. The moral equivalent of a TI-30: arithmetic, logarithms, exponentials, trig functions, inverse-trig functions, but no text-storage memory, no wireless capability, no graphing capability, and no computer-algebra system.

6 Topics to know about:

(i) What an operator is.

(ii) What a linear operator is.

(iii) initial conditions for second-order differential equations.

(iv) What is a linear differential equation? A homogeneous differential equation? An inhomogeneous differential equation?

(v) The existence and uniqueness of solutions to initial-value problems involving second-order linear differential equations.

(vi) Writing a $\mathbf{2}\boldsymbol{OLDE}$ in terms of a linear operator.

(vii) What a linear combination is.

(viii) Matrix Cramer for two equations in two unknowns.

(ix) What an FSS for a $\mathbf{2}\boldsymbol{OLDE} = \mathbf{0}$ is.

(x) Why an FSS is important.

(xi) Finding an FSS for $\mathbf{2}\boldsymbol{OLDE} = \mathbf{0}$ $\boldsymbol{CC}$, a second-order homogeneous linear differential equation with constant real coefficients.

(xii) The genesis of the characteristic equation for a $\boldsymbol{2OLDE = 0\ CC.}$

(xiii) If a given $\boldsymbol{2OLDE = 0\ CC}$ has characteristic equation $\boldsymbol{ar^2 + br + c = 0,}$ with $\boldsymbol{a,}$ $\boldsymbol{b,}$ and $\boldsymbol{c}$ all real, be able to come up with an FSS comprised of real-valued functions in each of these cases:

(A) quadratic discriminant positive

(B) quadratic discriminant zero

(C) quadratic discriminant negative

(a) $\boldsymbol{b = 0}$

(b) $\boldsymbol{b \neq 0}$

(xiv) The Reduction-of-Order trick for growing an FSS from a single solution. We will encounter other ideas like this.

(xv) The structure of the solution of an inhomogeneous $\boldsymbol{2OLDE}$ (complementary and particular solutions).

(xvi) How to solve initial-value problems involved with inhomogeneous second-order differential equations.

(xvii) The possible graphs of solutions of initial-value problems for $\boldsymbol{2OLDE = 0\ CC,}$ where the coefficients are real.

(xviii)

7 From the 10/21/05 Test #2, relevant problems: 5

8 From the 10/22/04 Test #2, relevant problems: 1, 2, 3, 5.