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`/m333.fa07/handouts333/t3_333_B30/REVSTUFF/review_suggestions_3.tex`

- 1 This list is not in final form. Like, stuff may yet be added to it.
- 2 Test #3 is  
  
Friday  
11/30/07.
- 3 The test will cover the material of Assignments #13 – #18. See also the topic list below.
- 4 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.
- 5 Topics to know about:
  - (i) The basic definition of “eigenpair.”
  - (ii) How to put together a general-solution formula for an inhomogeneous 2OLDE with constant coefficients. And how to solve IVPs in such a situation.
  - (iii) The Undetermined-Coefficient method for constant-coefficient inhomogeneous 2OLDEs with right-hand sides  $\mathbf{g}(t)$  as in table 3.1 on page 163.
  - (iv) The Method of Variation of Parameters, which works for situations where the  $\mathbf{g}(t)$  can't be found in table 3.1, or the differential equation has variable coefficients, *or* the undetermined-coefficients “guess” doesn't fit in with our current career goals.
  - (v) The DEs which give rise to undamped beats, and the appearance of their solutions.
  - (vi) The DEs which give rise to undamped resonance, and the appearance of their solutions. I wouldn't ask you to derive this stuff, but I believe you should recognize it.
  - (vii) Problem 3.10: 10 had a discontinuous right-hand-side function.
  - (viii) Computing determinants of big square matrices.
  - (ix) Multi-solution systems of linear equations.
  - (x) Computing the inverse of a square matrix, via Gauss-Jordan elimination and via the adjugate method.

- (xi) Connection of existence of  $\mathbf{A}^{-1}$  with the determinant of  $\mathbf{A}$  and the solutions of  $\mathbf{A}\vec{x} = \vec{\theta}$ .
- (xii) Eigenstuff for square matrix  $\mathbf{A}$  with real constant entries, definitions as well as computations.
- (xiii) The Wronskian in context of  $\vec{y}' = \mathbf{A}\vec{y}$ .
- (xiv) A fundamental set of solutions (FSS) in context of  $\vec{y}' = \mathbf{A}\vec{y}$ .
- (xv) An IVP and its solution in context of  $\vec{y}' = \mathbf{A}\vec{y}$ .
- (xvi) A general-solution formula for  $\vec{y}' = \mathbf{A}\vec{y}$  from the eigenstuff of  $\mathbf{A}$ .
- (xvii) Multi-tank mixing problems set up (4.1: 30 and 4.5: 14).
- (xviii) I won't put the complex-eigenstuff on Test #3.

**6** In the old-tests collection:

- (a) the 11/11/05 Test #3: problems 1-6.
- (b) the 9/17/04 Test #1: problem 7
- (c) the 10/22/04 Test #2: problems 2-4
- (d) the 12/13/04 Final: problem 7