

MATH 251 SPRING SEMESTER 2008
Final Exam study guide

Exam Date/Time: Wednesday, May 7, 12:20 to 2:10 pm
Format: 150 points in 13 questions (7 x multiple-choice, and 6 x partial-credit)
The exam is cumulative, with approx. 60% based on new (chapter 10) material.

A table of Laplace transforms (a copy of table 6.2.1 from the textbook) will be provided during the exam.

Topics to study

All the topics from the midterm exams:

http://www.math.psu.edu/tseng/class/Math251/MATH251_SP2008_exam_1_guide.pdf

http://www.math.psu.edu/tseng/class/Math251/MATH251_SP2008_exam_2_guide.pdf

Plus,

1. Separation of variables
2. Two-point eigenvalue problems; finding eigenvalues / eigenfunctions
3. Fourier series; Euler-Fourier formulas
4. The Fourier Convergence Theorem
5. Even and odd functions; Even and odd periodic extensions
6. Solution of heat conduction problems (w/ different boundary conditions)
7. Steady-state solution of the heat conduction equation

The topics below are explicitly NOT covered on the final exam:

- a. Exact equations
- b. Mixing/Compound interest/air resistance problems
- c. Reduction of order
- d. Undetermined coefficients method
- e. Higher (3+) order linear equations with constant coefficients
- f. Predator-prey problems
- g. Laplace/potential equations

Comments: Students should know basic integration techniques; partial differentiation; the general long-term behavior of different types of solutions; stability/ phase portrait/damping classifications; Laplace transforms; computing Fourier coefficients and determine the convergence of Fourier series; and each of the steps used to solve a second order linear PDE initial-boundary value problem.