

Notes on the Final Exam

- The exam will be approximately 1.5 times as long as a normal exam.
- We'll have two hours to complete the exam.
- About 1/4 to 1/3 of the exam will be over the newest material (chapter 6).
- What will be provided for the exam:
 - Partial tables for the Laplace, Fourier and Fourier sine/cosine transforms.
 - The eigenfunction summary page.
- You may put together one page of notes on anything you wish.
- How to study for this exam:
 - Review chapter 6.
 - Go through the old exams and old study guides. Make notes as you go so that you remember what things on your list were handy to have.
- Try to organize your thoughts along the following ways:
 1. What techniques did we have to solve first order PDEs?

In chapter 1, we looked at “special” PDEs that could be cast as ODEs. In chapter 5, we primarily used a change of coordinates. We can also use transforms to solve a first order PDE, depending on the conditions (is $x > 0$ or $a < x < b$, for example).
 2. Be able to identify the “big three” PDEs.
 3. What techniques did we have to solve second order PDEs?

We primarily used separation of variables. This led us to the eigenvalue problem and Fourier series. Finally, we had the transform method.

Remember that we also talked about solving the homogeneous PDE and/or homogeneous boundary conditions, then discussed how to solve the nonhomogeneous cases for both.
 4. What were some of the main conclusions of the Fourier series? (Hint: What kinds of convergence results did we get).