Outline
This is an outline of the material that you will be responsible for on the midterm exam. The questions will be similar to the problems in the homework assignments.

Reminder: Midterm Exam is on Tuesday, February 13th in class

• Basic Classification of PDE’s (Order, Linear vs. Non-linear, Homogeneous vs. Non-Homogeneous)
• First Order Linear PDE’s $a(x, y)u_x + b(x, y)u_y = 0$
  – Solution by Method Characteristics (Geometric Approach)
  – Solution by Change of Coordinates (Algebraic Approach)
• Classification of Linear Second Order PDE’s
  – Elliptic
  – Hyperbolic
  – Parabolic
• Solutions of Initial Value Problems for 1-D Wave Equation (Hyperbolic PDE)
  – Causality
  – Energy Method
• Solutions of Initial Value Problems for 1-D Diffusion Equation (Parabolic PDE)
  – Maximum Principle
  – Energy Method
• Solutions of Boundary Value Problems for 2-D Laplace Equation on a Disk (Elliptic PDE)
  – Maximum Principle
  – Mean Value Theorem