

MATH 241 — HOMEWORK 2.

due on Friday, September 18.

Textbook: “*Applied Partial Differential Equations with Fourier Series and Boundary Value Problems*”, fifth edition
by Richard Haberman

Topics:

- Chapter 1: Heat Equation
 - 1.1 Introduction
 - 1.2 Derivation of the Conduction of Heat in a One-Dimensional Rod
 - 1.3 Boundary Conditions
 - 1.4 Equilibrium Temperature Distribution
 - * 1.4.1 Prescribed Temperature
 - * 1.4.2 Insulated Boundaries
 - 1.5 Derivation of the Heat Equation in Two or Three Dimensions

Second Homework Assignment.

Reading:

- Read Sections 1.1, 1.2, 1.3, 1.4 and 1.5 from the book.
- Read your notes.

Exercises:

Problem 1. Derive the formula for the Laplacian in cylindrical coordinates (Formula 1.5.19 in the book.)

Problem 2. Derive the formula for the Laplacian in spherical coordinates (Formula 1.5.22 in the book.)

Problem 3. Derive the formula for the 2-dimensional Laplacian in polar coordinates.

Exercises:

- Page 13: problems: 1.3.2, 1.3.3
- Page 18: problems: 1.4.1 (a),(g), 1.4.4, 1.4.7 (a),(c), 1.4.11