

## MATH 241 — HOMEWORK 3.

due on Friday, September 25.

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

### Topics:

- Chapter 2. Method of Separation of Variables
- 2.1 Introduction
  - 2.2 Linearity
    - \* 2.3 Heat Equation with Zero Temp. at Finite Ends
      - (2.3.2) Separation of Variables
      - (2.3.3) Time-Dependent Equation
      - (2.3.4) Boundary Value Problem
      - (2.3.5) Product Solutions and Superposition
      - (2.3.6) Orthogonality of Sines
    - \* 2.4 Worked Examples
      - (2.4.1) Heat Conduction in a Rod with Insulated Ends

### Third 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.** Do problems 2.3.5 and 2.3.6 from the book (page 52) but use Euler’s formula for both of them. Explain why this is actually the same as the method in the book.

#### **Problems:**

- Page 34: problems: 2.2.4
- Page 51: problems: 2.3.1 (a),(d), 2.3.2 (e),(g), 2.3.3 , 2.3.8