MATH 241 — HOMEWORK 9.

due on Friday, November 6.

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

Topics:

- Chapter 7. Higher-Dimensional Partial Differential Equations
    - 7.4 Statements and Illustrations of Theorems for the Eigenvalue Problem $\nabla^2 \phi + \lambda \phi = 0$
    - 7.7 Vibrating Circular Membrane and Bessel Equation
        * 7.7.1 Introduction
        * 7.7.2 Separation of Variables
        * 7.7.3 Eigenvalue Problems (One-Dimensional)
        * 7.7.4 Bessel's Differential Equation
        * 7.7.5 Singular Points and Bessel's Differential Equation
        * 7.7.6 Bessel Functions and Their Asymptotic Properties (Near $z = 0$)

Ninth Homework Assignment.

Reading:

- Read Section 7.4, and Subsections 7.7.1 to 7.7.6 from the book.
- Read your notes.

Exercises: **Problems:**

- Page 287: problems: 7.4.1
- Page 308: problems: 7.7.1, 7.7.2 (c)(d), 7.7.6, 7.7.10, 7.7.11
- Page 317: problems: 7.8.5, (only as $z \to 0$.)