MATH 817: INTRODUCTION TO MODERN ALGEBRA I FALL 2025

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Introduction

These are the lecture notes and class materials for Math 817 Introduction to Modern Algebra I in Fall 2025. This is the first of a two part course on groups, rings, and modules. In this first half, we will discuss group theory, including group actions, and introduce rings. A major goal of this course is to prepare graduate students for the PhD qualifying exam in algebra. The lecture notes draw heavily on Eloísa Grifo's notes from Fall 2024:

https://eloisagrifo.github.io/Teaching/algebra.pdf

which in turn draw from earlier lecture notes of Mark Walker and Alexandra Seceleanu. The impatient reader can go there to read ahead. The textbook

Abstract Algebra by Dummit and Foote

is a good resource covering similar material at a similar level.