

Math 7110 – Homework 8 – Due: November 15, 2021

Practice Problems:

Test practice:

Problem 1. Dummit and Foote 8.3 # 1, 2

Type solutions to the following problems in L^AT_EX, and email the tex and PDF files to me at dbernstein1@tulane.edu by 10am on the due date. Please title them as [lastname].tex and [lastname].pdf. When preparing your solutions, you must follow the rules as laid out in the course syllabus.

Graded Problems:

Problem 2. Recall that we have the following containments:

fields \subset Euclidean domains \subset P.I.D.s \subset U.F.D.s \subset integral domains \subset commutative rings with 1

For each of the following rings, say where on the above spectrum they appear and give a *brief* defense of your answer:

- (1) $\mathbb{C}[x]$
- (2) $\mathbb{R}[x]$
- (3) $\mathbb{Q}[x]$
- (4) $\mathbb{Z}[x]$
- (5) $\mathbb{R}[x]/(x^2 + 1)$
- (6) $\mathbb{C}[x]/(x^2 + 1)$
- (7) $\mathbb{Z}[x]$
- (8) $\mathbb{Z}[i]$
- (9) $\mathbb{Z}[2i]$

Problem 3. Dummit and Foote, 8.3 # 5