

Math 323, Homework 4, Due Thursday February 6.

1. Find the necessary and sufficient condition on the integers D_1 and D_2 for the fields $\mathbb{Q}[\sqrt{D_1}]$ and $\mathbb{Q}[\sqrt{D_2}]$ to be isomorphic.
2. Section 7.6 Problem 1.
3. Section 7.6 Problem 2.
4. Section 7.6 Problem 4.
5. (a) Let F be a field. Prove that the ring $F[x]/(x^2 - x)$ is isomorphic to $F \times F$.
(b) Is it true that $F[x]/(x^2)$ is isomorphic to $F \times F$?
6. Section 8.1 Problem 7.
7. Section 8.1 Problem 9.
8. Section 8.1 Problem 11.