

Homework 2: Section 3.1

Due Tuesday, September 12

- I. Cartesian products
 - A. Read about Cartesian products on page 507 and in the example at the bottom of page 48.
 - B. (10 points) page 51 #7.
 - C. (10 points) #8 parts (a) and (b).
- II. (10 points) Addition and Multiplication Tables
 - A. page 52 #13 part (b). Note that the answers for part a are in the back of the book.
 - B. page 53 #24
- III. (10 points) Choose **one** of the following two exercises. You can do both if you want to, but only turn in one of the two.
 - A. Fundamental: page 51 #9.
 - B. Challenging: Let $\mathbb{Q}[\sqrt{2}]$ be the set given by

$$\mathbb{Q}[\sqrt{2}] = \{a + b\sqrt{2} \mid a, b \in \mathbb{Q}\}.$$

Prove that $\mathbb{Q}[\sqrt{2}]$ is a subfield of \mathbb{R} .