

Math 215
Homework 11

You don't need to turn in this assignment. The problems, including the ones from the text, are all important though as preparation for the exam.

Read Section 14. Exercises from the text: 14.1, 14.2, 14.4

To turn in:

1. Prove that the set

$$\{x \in \mathbb{R} \mid x^2 \in \mathbb{Q}\}$$

is denumerable.

2. Give a proof of Proposition 12.1.2 by induction on $n = |Y|$.

Hint. For the inductive step, use the Binomial Theorem to expand $(k + 1)^m$. Then, if $|Y| = k + 1$, decompose the set $\text{Fun}(X, Y)$ in terms of which subset of X is sent to the element $y_{k+1} \in Y$.

3. Page 183, Problem 7