Math 436 (Spring 2020) - Homework 3

1. **Chapter 2:** 27, 28

   Hint: for question #28, apply Lemma (2.14) in Chapter 2.

2. **Chapter 3:** 1, 2, 3

   Hint: for question #2, a nested sequence of squares gives a nested sequence of intervals in each coordinate.

3. Let X be compact space. If $\{A_i\}_{i\in\Lambda}$ is a collection of closed subsets of X such that $\bigcap_{i\in\Lambda} A_i = \emptyset$. Prove that there is a finite subcollection $\{A_{i_1}, A_{i_2}, \cdots, A_{i_n}\}$ such that

$$A_{i_1} \cap A_{i_2} \cap \cdots \cap A_{i_n} = \emptyset.$$