Homework 2
Due: Oct. 1 (Thursday)

Question 1.

Solve Exercise 6 of Chapter 2 of Lax.

Question 2.

Solve Exercise 7 of Chapter 2 of Lax.

Question 3.

Let X be a finite dimensional vector space. Prove that a vector $x = 0$ if and only if $f(v) = 0$ for all $f \in X'$.

Question 4.

Let V be a subspace of a finite dimensional vector space X. Let $f_1, f_2, ..., f_n \in X'$ and let the linear functions $f'_1, f'_2, \ldots, f'_n$ their restrictions on V.

- Prove that if $f'_1, f'_2, ..., f'_n$ are linearly independent then $f_1, f_2, \ldots, f_n$ are linearly independent.

- Prove that if $X' = \langle f_1, f_2, \ldots, f_n \rangle$ then $V' = \langle f'_1, f'_2, \ldots, f'_n \rangle$.

Question 5.

Solve Exercise 2 Chapter 3 of Lax.