Homework #11
Due Date:
Reading Assignment: Chapter 6
Problems:

1. Exercises 6.1–1(i)

2. Exercises 6.1–4. (This exercise is as follows. Let $V \subset \mathbb{R}^n$ be a subspace of $\mathbb{R}^n$, and let $P : \mathbb{R}^n \rightarrow \mathbb{R}^n$ and $R : \mathbb{R}^n \rightarrow \mathbb{R}^n$ be the linear transformations defined respectively by projecting onto and reflecting across $V$. Find the eigenvalues and eigenvectors of both $P$ and $R$. For the answers of the eigenvectors, please give the eigenspace $E(\lambda)$ for each eigenvalue $\lambda$ of $P$ and $R$.)

3. Exercises 6.1–9

4. Exercises 6.1–10(a) (Hint: it is true)

5. Exercises 6.2–11

6. Exercises 6.3–9

7. $A$ and $B$ are two $n \times n$ matrices. Prove that $AB$ and $BA$ have the same set of eigenvalues by proving that a scalar $\lambda \neq 0$ is an eigenvalue of $AB$ if and only if it is an an eigenvalue of $BA$. (Hint: consider $y = Bx$, where $ABx = \lambda x$)