Math 51 Homework 1

Due Friday June 24, 2016 by 1 pm

Instructions: Complete the following problems. Late homework will not be accepted. Please be sure to review the expectations for your submitted homework outlined online (such as: always including your name and ID number on the homework, stapling your homework, and guidelines for write-ups which will receive full credit).

Part I: Book problems: From Levandosky's *Linear Algebra*, do the following exercises:

- Section 1: #7, 9
- Section 2: #2ab, 3, 12, 16
- Section 3: #3, 4, 9, 13
- Section 4: # 4, 12.

Part II: Non-book problems:

1. Suppose you manage a mutual fund that invests in one thousand companies. Let $\mathbf{S}$ be the vector in $\mathbb{R}^{1000}$ whose i-th component is the number of shares of company i that you have today. Let $\mathbf{P}$ be the vector in $\mathbb{R}^{1000}$ whose i-th component is today's price per share of company i's stock (say, in dollars). Express the total value of your holdings in terms of vector operations.

2. (a) Find the intersection of the line $\{\begin{bmatrix}0\\1\end{bmatrix} + s\begin{bmatrix}3\\-1\end{bmatrix} | s \in \mathbb{R}\}$ and the line $\{\begin{bmatrix}1\\2\end{bmatrix} + t\begin{bmatrix}1\\1\end{bmatrix} | t \in \mathbb{R}\}$.
(b) Find the intersection of the line $\{\begin{bmatrix}1\\2\end{bmatrix} + s\begin{bmatrix}2\\3\end{bmatrix} | s \in \mathbb{R}\}$ and the line $\{\begin{bmatrix}3\\5\end{bmatrix} + t\begin{bmatrix}1\\1.5\end{bmatrix} | t \in \mathbb{R}\}$.