Math 19620/20 Homework 3
Due: Thursday, October 25, 2018, at **5:00pm** in my mailbox in the basement of Eckhart (You can also give it to me in class on Thursday if you prefer.)

Please present your solutions clearly and in an organized way. Think of it this way: if you show it to another student in this class, he/she should be able to understand it without needing to ask you questions.

October 18

Goals:

- Practice multiplying matrices
- Understand and apply the fact that matrix multiplication corresponds to function composition.

Exercise not from the textbook:

1. Suppose $f : \mathbb{R}^m \to \mathbb{R}^p$ and $g : \mathbb{R}^p \to \mathbb{R}^n$ are linear transformations. Show that $g \circ f$ is a linear transformation. (You can find the proof in the textbook, but try to do it yourself first.)

Exercises 2.3:

- 1, 3, 5, 10, 13
- 43, 44, 45
- 57 (even though we haven't talked about inverse matrices yet, you don't need them to solve this problem)

October 23

Goals:

- Practice different ways of finding inverses
- Using inverses to find certain linear transformations.

Exercises 2.4:
Except for the first two problems, you can use Wolfram Alpha to find the inverse matrix.

- 1 (Please do this by hand in two different ways: with Theorem 2.4.5, and with Theorem 2.4.9.)
- 11 (Please do this by hand.)
- 19
- 76 (Hint: to solve $3x = 5$ for x, we multiply both sides by 3^{-1} to get $x = 5/3$.)
- 79 (Ignore the sentence "Compare with Exercise 77.")