# Homework 8–21-241 Lec5, Matrices and Linear Transformations

Name: _____
Section: _____

**Instructions:** Complete the following problems, clearly labeling the problems. Staple this sheet, with your name and section filled in, to the top of your work. Failure to attach this sheet will result in a one point deduction in the grade. The assignment will be graded out of ten points.

**DUE: November 13, 2015**

## Book Problems

- Section 6.1: 6, 10, 14, 26, 38, 48, 49
- Section 6.2: 2, 6, 15

## Other Problems

1. Which of the ten axioms for a vector space (see the definition on page 429 of your textbook) fail for the set $V = \mathbb{R}^2$ with addition defined in the usual way and scalar multiplication defined by

$$c \begin{bmatrix} a \\ b \end{bmatrix} = \mathbf{0}$$

   for $a, b, c \in \mathbb{R}$?

2. Let $S = \{\mathbf{v}_1, \ldots, \mathbf{v}_k\}$ be a set of vectors in vector space $V$. Show that $S$ is linearly dependent if and only if one of the vectors in $S$ is a linear combination of the other vectors in $S$.