

Homework 5–21-241 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: Friday, October 16, 2015

Book Problems

- Section 4.1: 6, 12
- Section 4.2: 10, 14, 26, 36, 46, 52, 56
- Section 4.3: 8, 16, 24

Other Problem

1. For a function $f : A \mapsto B$ for some sets A and B , f is onto, or surjective, if and only if for each $b \in B$, there is some $a \in A$ such that $f(a) = b$. We call f one-to-one, or injective, if and only if for any $x, y \in A$ such that $f(x) = f(y)$, we have that $x = y$.

Let $T : \mathbb{R}^n \mapsto \mathbb{R}^n$ be a linear transformation with standard matrix A , that is, $T(\mathbf{x}) = A\mathbf{x}$ for each $\mathbf{x} \in \mathbb{R}^n$. Show that A is invertible if and only if T is one-to-one and onto.