

Linear Algebra (MATH 3333) Spring 2009 Section 2

Homework 5

Due: Wed. Feb. 25th, start of class

Instructions: Please read the homework policies and guidelines posted on the course webpage. You may **not** use a calculator (or computer). Make sure to write your name, course and section numbers in the top right corner of your solution set, as well as the assignment number on top. Page/section numbers refer to the course text.

Reading

Look over Section 4.1 and read Sections 4.2 and 4.3, up to p. 200, in the text.

Conceptual Questions (not to be turned in)

1. What is a vector space and why did we define it?
2. What is the relation between images of linear transformations and vector spaces.

Written Assignment

Total: 100 points

Each problem is worth 10 points except those marked otherwise.

Section 4.2 (pp. 196–197): 1, 2, 7 (5 pts), 8 (5 pts), 13, 21, 24

Section 4.3 (pp. 205–206): 2 (5 pts), 5, 6 (no justification is needed for 5 and 6)

Problem A: (15 pts) Draw the cone $C = \{(x, y, z) | x^2 + y^2 = |z|\}$. Is it the image of some linear transformation $A : \mathbb{R}^m \rightarrow \mathbb{R}^3$? Justify your answer (prove it).