MATH-332: Linear Algebra <u>Chapter</u>: 4

Vector Spaces

<u>Section</u> 4.6: Rank

pgs. 262 - 271 *July 13, 2009*

<u>Lecture:</u> Rank

Topics:	Row Space
	The Rank Theorem
	Invertible Matrix Theorem
Problems	Prac: 1, 2, 3, 4
	Prob: 7, 15, 17, 18, 21, 27, 28, 31

Section Goals

- Understand how the concept of Rank is an important tool for classifying the classical matrix spaces.

- Study the solubility of $\mathbf{Ax} = \mathbf{b}$ using the concept of row-space, column-space, null-space and their associated dimensions.

Section Objectives

- Define the row-space of a matrix and using it define the rank of a matrix stating its equivalence to the dimension of the column space.

- State and prove the rank-nullity theorem 4.6.114 on page 265 and using it expand on the invertible matrix theorem of chapter 2.