

Midterm 2 Review

The midterm will cover vector spaces/determinants/matrices as functions. You are responsible for everything from Midterm 1 through last Friday (the 20th).

From Jacob: You should know the following:

3.4 (all), 4.1 (except Thm 11 and Corollary)

4.3 (all), 4.4 (you should know how to use Thm 17 to compute the inverse and use that to solve equations. I don't care about Cramer's rule).

Chapter 5 - (all, except the Chemistry).

The notes I wrote about bases, spans etc...

6.1 (except Thm 3 and the Chemistry)

6.2 (rotations in the plane ... although you should study class notes, not the book here)

Also, you should be able to describe geometrically the functions $A: \mathbb{R}^n \rightarrow \mathbb{R}^m$ associated to given $m \times n$ matrices A .

Practice Problems

From Jacob:

3.4 - 1, 2, 6, 7, 11

4.1 - 1, 3, 8, 15

4.3 - 1, 2, 3, 4, 7

(hint: if $r \in \mathbb{R}$ and A is $n \times n$, then
 $\det(rA) = r^n \det(A)$)
 \Leftarrow also, prove this \rightarrow

4.4 - 1, 3, 5, 6, Props of Adjoint.

5.1 - 2, 3, 4, 5

5.2 - 2, 3, 4, 6, 7, 10

5.3 - 2, 4, 5, 9, 10

6.1 - 1, 2, 3c, 6

Describe Geometrically $A: \mathbb{R}^3 \rightarrow \mathbb{R}^3$ if

(1) $A = \begin{pmatrix} 0 & 2 & 0 \\ 2 & 0 & 0 \\ 0 & 0 & 1 \end{pmatrix}$

(2) $A = \begin{pmatrix} -1 & 0 & 0 \\ 0 & -1 & 0 \\ 0 & 0 & -1 \end{pmatrix}$