

Things to Know For The Second Exam

Exam covers Sections
2.2, 2.3, 2.7, 3.1, 3.2,
4.1-4.6

You don't need to know
any thing about "pivots"

Chapters 2 + 3

- How to add and multiply matrices (the order matters with multiplication)
- zero and identity matrices
- How to find the determinant of an $n \times n$ matrix
- Properties of determinants
($\det(A^t) = \det(A)$, etc.)

- How to show a matrix is invertible by calculating its determinant
- How to find the inverse of an invertible matrix
- Properties of Inverses
($(AB)^{-1} = B^{-1}A^{-1}$, etc.)

- What "homogeneous coordinates" means
- How to rotate, scale, and shift vectors in homogeneous coordinates & how to make the associated matrices

Chapter 4

- Examples of vector spaces
- The subspace test and how to apply it
- Definition of a basis
- Definition of dimension

- How to find a basis and the dimension for a given vector space (to show you have a basis, you need to check both spanning and linear independence)
- Definition of a linear transformation between two vector spaces and how to check that a given function is linear

- How to find the matrix of a linear transformation from \mathbb{R}^n to \mathbb{R}^m with respect to a given basis.
- Definition of isomorphism for vector spaces
- How to define and find $\text{Col}(A)$, $\text{Row}(A)$, $\text{Nul}(A)$, and $\text{Ran}(A)$ for a given matrix

— The Rank Theorem