

Math 2135 Spring 2019 - Review for Midterm 1

1. Matrices.

- (1) elementary row operations, (reduced) row echelon form, pivot columns
- (2) multiplication of matrix by column vector

2. Systems of linear equations.

- (1) coefficient and augmented matrix
- (2) solving a linear system by row reduction, pivot columns, free variables, give solution in parametrized vector form
- (3) consistency and number of solutions of systems
- (4) solutions of homogenous systems $Ax = 0$ and inhomogenous systems $Ax = b$, nullspace of A

3. Fields.

- (1) axioms of fields, examples $\mathbb{R}, \mathbb{Q}, \mathbb{C}, \mathbb{Z}_2, \mathbb{Z}_3, \dots$, properties of fields
- (2) linear systems over arbitrary F

4. Vector spaces.

- (1) axioms of vector spaces over F , examples F^n , functions, \dots , properties of vector spaces
- (2) linear combination of vectors, span, column space, row space of matrices
- (3) axioms of subspaces, examples
- (4) linearly independent vectors, basis, spanning set theorem