Math 2135 Fall 2018 - Review for Midterm 2

1. **Vector spaces.**
   (1) operations and their properties for vector spaces over arbirtrary fields
   (2) examples of vector spaces: tuples, functions, polynomials P_n
   (3) subspaces: definition and examples (span, null space)

2. **Basis of vector spaces.**
   (1) linear independence, spanning set, dimension
   (2) reduce a spanning to a basis, extend a linear independent set to a basis
   (3) bases for column space, row space, null space of a matrix
   (4) coordinates with respect to a basis
   (5) change of coordinate matrix

3. **Matrices.**
   (1) inverse matrices and their properties
   (2) inverse matrix via row reduction
   (3) formula for inverse of 2×2-matrix