

# Review for exam I

## Things to Know for Exam I

(i) Basic facts from linear algebra as presented in the lectures.

There will be 5 True-False and or short answer questions questions.

For these study highlighted comments and statements in the class notes, and know simple calculations for which the answer can just be written down.

(ii) Be able to verify that a given set of numbers is a solution to a linear equation or a system of linear equations.

(iii) Be able to write the general solution to a system of equations directly from the RREF of the augmented matrix.

(iv) Know how to convert a system of equations to an augmented matrix and then how to use elementary row operations to put the augmented matrix into RREF

(v) Know how to find a set of basic solutions to a homogeneous system of equations.

(vi) Know how to find the rank of a matrix.

## Things to Know for Exam I

- (vii) Know how to convert a systems of linear equations into a single matrix equation.
- (viii) Know how to determine if the inverse of a square matrix  $A$  exists, and how to find the inverse of  $A$  using elementary row operations on the augmented matrix  $[A \mid I_n]$  or using the determinant formula in the  $2 \times 2$  case.
- (ix) Know how to solve a linear system of equations by writing a matrix equation and using the inverse of the coefficient matrix.
- (x) Know how to evaluate matrix expressions involving addition, scalar multiplication and transpose of matrices.
- (xi) Know when a product of matrices exists and how to evaluate matrix expressions containing the product of matrices.
- (xii) Know how to convert row operations to elementary matrices and how to convert elementary matrices to row operations.
- (xiii) Know how to write an invertible matrix or its inverse as a product of elementary matrices.
- (xiv) If  $A$  is obtained from  $B$  by elementary row operations, know how to find  $C$  such that  $CA = B$ .