MATH 2418

Exam 2 Reviews

3.2

The Nullspace of A: Solving Ax = 0 and Rx = 0

**Book**

Chapter main points

1. The nullspace N(A) in Rn contains all solutions x to Ax = 0. This includes 0.
2. Elimination (from A to U to R) does not change the nullspace
3. The RREF has all pivots equal to 1 and zeros above and below.
4. If column j of R is free (no pivot\_, there is a special solution to Ax = 0 with xj = 1
5. Number of pivots = number of non-zero rows in R = rank r. There are n-r free columns
6. Every matrix m < n has nonzero solutions Ax = 0 in its null space.

Facts

(E32E31E21) A = U **--->** (E21-1E31-1E32-1) A = U **--->** A = LU

Rules

**Class**

**Recitation**