

**Math355**  
**Review Sheet Test 1**  
**Sept 16, 2005**

**Sect 6.1**

- Know how to add, subtract matrices and when you can perform those operations and when you can't.

**Sect 6.2**

- Know how to multiply matrices and when you can multiply matrices and when you can't.

- (2) on p. 313

- (4) on p. 314

- (5) on p. 315

**Sect 6.3**

- Know how to perform Gauss Elimination to solve a system of linear equations.

**Suggested problems:** 1, 3, 5, 7, 9, Example 3, Example 4, Example 5.

**Sect 6.4**

- Know how to find the rank of a matrix.

- Know how to determine linear independence or linear dependence of a set of vectors.

**Suggested problems:** 1, 3, 5, 7, 9, 11, 13.

**Sect 6.5**

- The definition of homogeneous linear system.

**Sect 6.6**

- Know how to evaluate determinant of a 2x2 and 3x3 matrices.

**Suggested problems:** 5, 7, 9, Example 5, Example 6.

**Sect 6.7**

- (1) on p. 350.

- (7) on p. 355.

- (10) on p. 356.

- Know how to find an inverse of a 2x2 matrix using the formula (4\*) on p. 353.

- Know how to find an inverse of a 3x3 matrix using Gauss-Jordan Elimination.

**Suggested problems:** 1, 3, 5, 7, 9, 10, 11, 12, 13, 14.

**Sect 7.1**

- Know the definition of eigenvalue and eigenvectors and know how to find them from a matrix.

- Theorem 1 and Theorem 2.

**Suggested problems:** 1, 3, 5, 7

### Sect 7.3

- Definitions of symmetric, skew-symmetric, and orthogonal matrices (p.381).

Example 1.

- Rotation matrix (6) on p. 382.

- Theorem 2 and its proof.

- Theorem 3

- Theorem 4 and its proof.

**Suggested problems:** 1, 3, 7, 11.

### Sect 7.4

-  $\bar{A} = [\bar{a}_{jk}]$  and  $\bar{A}^T = [\bar{a}_{kj}]$

- Definitions of Hermitian, skew-Hermitian and unitary matrices.

Example 1.

- (7) and (8) on p. 389.

- Theorem 2 and its proof.

- Theorem 2 and Theorem 4.

**Suggested problems:** #5 and 7.