

# Math 322-001- Matrix Algebra

## Exam 1 Review

### Fall 2015

#### List of sections from textbook

- Chapter 1 - Sections 1-5 and 7-9
- Chapter 2 - Sections 1-3

**List of important terms:** (You should know the meaning of these and be prepared to state a definition)

- Chapter 1 - System of Linear Equations; consistent/inconsistent system; augmented matrix; pivot; free variable; (reduced) echelon form; general solution; particular solution; column/row vector; scalar; linear combination; span; homogeneous system; trivial solution; linearly independent; linear transformation; domain of transformation; image/range of transformation; onto transformation; one-to-one transformation
- Chapter 2 - Diagonal matrix; identity matrix; transpose of matrix; inverse of a matrix; invertible/nonsingular matrix

#### List of procedures/algorithms you will be expected to know:

- Chapter 1 - Reducing a (possibly augmented) matrix to (reduced) echelon form; solving a system of equations; finding the general form of the solution to a matrix equation; multiplying a matrix with a vector; determine if  $\{\mathbf{v}_1, \dots, \mathbf{v}_n\}$  is independent; find a matrix corresponding to a linear transformation
- Chapter 2 - Matrix multiplication; finding inverse of a matrix; formula for  $2 \times 2$  inverse

#### List of results or formulas you will be expected to know:

- Chapter 1 - Parallelogram rule for vector addition; Theorem 1.4.4
- Chapter 2 -  $(AB)^T = B^T A^T$ ;  $(AB)^{-1} = B^{-1} A^{-1}$ ;  $(A^T)^{-1} = (A^{-1})^T$ ; Theorem 2.3.8; Theorem 1.9.11; Theorem 1.9.12

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#### Suggested problems from the text:

- 1.1: 7, 9, 11, 13, 23
- 1.2: 7, 9, 13, 21, 23, 25

- **1.3:** 7, 11, 13, 15, 23
- **1.4:** 7, 13, 19, 21, 23
- **1.5:** 5, 11, 17, 23
- **1.7:** 5, 13, 21, 23, 25
- **1.8:** 3, 5, 15, 19, 21
- **1.9:** 3, 7, 9, 13, 17, 23
- **2.1:** 11, 15, 19, 21, 23
- **2.2:** 5, 7, 9, 13, 21,
- **2.3:** 5, 7, 11, 17, 23