

Math 333 (2015) - Homework 1

Due: September 10, 2015.

NAME: _____

Most of the homework is a selection of exercises chosen from the textbook.

Show your work in each problem.

Staple this sheet to the front of your assignment

- 1) Section 1.1: #12
- 2) Section 1.2: #5
- 3) Section 1.3: #1 (Use the $\mathbb{R}^{m \times n}$ notation)
- 4) Section 1.4: #10
- 5) Section 1.4: #20
- 6) Section 1.4: #39
- 7) Section 1.4: #45
- 8) Section 1.4: #46
- 9) Let $A \in \mathbb{R}^{3 \times 3}$ be given by

$$A = \begin{bmatrix} 1 & 2 & 3 \\ 1 & 4 & 1 \\ 2 & 1 & 8 \end{bmatrix}$$

Using standard Gaussian elimination $A \sim B$ where B is upper triangular with ones on the diagonal:

$$B = \begin{bmatrix} 1 & * & * \\ 0 & 1 & * \\ 0 & 0 & 1 \end{bmatrix}$$

Here I do not mean reduced echelon form but rather echelon form with ones on the diagonal. Find elementary matrices E_i such that

$$E_3 E_2 E_1 A = B$$

as demonstrated in class. E_3 should be a diagonal scaling matrix.