

MATH 3A HOMEWORK 1

DUE: Monday, Oct 3

READING ASSIGNMENT: Read Sections 1.1-1.3.

PROBLEMS FROM TEXTBOOK:

Section 1.1: 3, 7, 8, 12, 16, 20, 23

Section 1.2: 2, 5, 8, 12, 19, 22

Section 1.3: 10, 11, 16, 22, 25, 31

ADDITIONAL PROBLEMS:

1) Let $A = \begin{bmatrix} 6 & 0 & 4 & 7 \\ 2 & 0 & 1 & 9 \\ 5 & 0 & 3 & 5 \end{bmatrix}$. Which of the following matrices is not row equivalent to A .

(a) $B = \begin{bmatrix} 12 & 0 & 8 & 14 \\ 2 & 0 & 1 & 9 \\ 1 & 0 & 1 & 2 \end{bmatrix}$

(b) $C = \begin{bmatrix} 6 & 0 & 4 & 7 \\ 0 & 0 & 1 & -20 \\ 2 & 1 & 3 & 0 \end{bmatrix},$

(c) both of them are

(d) none of them are.

2) A system of 5 linear equations and 7 variables could not have:

(a) 0 solutions.

(b) 1 solution.

(c) infinitely many solutions.

(d) More than one of these is possible.

(e) All of these are possible numbers of solutions.

Explain your answer.

3) Determine if the following statements are true or false. Explain your answers.

(a) Adding a row of a linear system with itself does not change the solution set of the linear system.

(b) Suppose a linear system has a unique solution. Then in the corresponding coefficient matrix, there is a pivot in every column.

(c) Suppose $\vec{v} = \begin{bmatrix} 2 \\ 1 \\ 4 \end{bmatrix}$. Then $\vec{w} = \begin{bmatrix} -2 \\ 3 \\ 1 \end{bmatrix}$ is in $\text{span}\{\vec{v}\}$.

(d) Let A be a 3×3 matrix. Suppose A has a pivot in every row. Then the span of the column vectors of A is all of \mathbb{R}^3 .