Name: _____

MATH 108
Fall 2021
HW 4: Due 10/05

"There are three choices in this life: be good, get good, or give up."
–Dr. Gregory House, House

Problem 1. (10pt) Find the matrix associated with the system of equations below.

$$\begin{aligned} 2x_1 - x_2 + 5x_3 &= 5 \\ x_1 \qquad\quad + x_3 &= -1 \\ 3x_2 - 6x_3 &= 4 \end{aligned}$$

Problem 2. (10pt) Write the system of equations associated to the matrix below.

$$\begin{pmatrix} 1 & -1 & 3 & 5 & 6 \\ 0 & 1 & 4 & 9 & -2 \\ 1 & 2 & 0 & -6 & 3 \\ 2 & -1 & 4 & 1 & 7 \end{pmatrix}$$

Problem 3. (10pt) Use matrix methods to solve the system of equations below. Show all your work.

$$6x_1 - x_2 = 13$$
$$2x_1 + 3x_2 = 1$$

Problem 4. (10pt) Use matrix methods to solve the system of equations below. Show all your work.

$$\begin{aligned} x_1 - x_2 + x_3 &= 2 \\ 2x_1 + 2x_2 - x_3 &= 9 \\ x_2 - 3x_3 &= 8 \end{aligned}$$

Problem 5. (10pt) Use WolframAlpha's `RowReduce` to find the solution to the following system of equations:

$$\begin{aligned} -6x_1 - x_2 + 7x_3 - 4x_4 + 3x_5 &= 83 \\ 2x_1 + 5x_2 + 2x_3 + 5x_4 + 7x_5 &= \frac{67}{3} \\ -8x_1 - x_2 - 9x_3 - 10x_4 &= -111 \\ 7x_1 - 6x_2 + 3x_3 - 5x_4 + 9x_5 &= \frac{97}{2} \\ 12x_1 - 4x_2 - x_3 + 5x_4 + 6x_5 &= 0 \end{aligned}$$