Name: _____

MATH 108
Spring 2023
HW 14: Due 05/01

"Of the many forms of false culture, a premature converse with abstractions is perhaps the most likely to prove fatal to the growth of a masculine vigour of intellect."

–George Boole

Problem 1. (10pt) Consider the following system of equations:

$$\begin{aligned} 3x - 2y &= -8 \\ -x + 3y &= 5 \end{aligned}$$

(a) Find the coefficient matrix, A.

(b) Show that A has an inverse.

(c) Use your answer from (b) to find the solution to the system of equations.

Problem 2. (10pt) The RREF form of a matrix coming from a system of equations is shown below. Determine if there is a solution. If so, find the solution(s). If not, explain why the system does not have a solution.

$$\begin{pmatrix} 1 & 0 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 & -4 \\ 0 & 0 & 1 & 0 & 6 \\ 0 & 0 & 0 & 1 & 4 \end{pmatrix}$$

Problem 3. (10pt) The RREF form of a matrix coming from a system of equations is shown below. Determine if there is a solution. If so, find the solution(s). If not, explain why the system does not have a solution.

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