Name: _____

MATH 108
Spring 2024
HW 18: Due 04/17

"The problem is, if all you care about in the world is the velvet rope, you will always be unhappy, no matter which side you're on."
— Tahani Al-Jamil, The Good Place

Problem 1. (10pts) The following matrix is the 'RREF' of an augmented matrix coming from a system of equations. Did this system of equations have a solution? If the system of equations had a solution, find all the possible solutions. If the system did not have a solution, explain why.

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

Problem 2. (10pts) Consider the matrix...

$$M = \begin{pmatrix} 1 & 8 \\ 1 & 4 \end{pmatrix}$$

(a) Compute $\det M$.

(b) Does M^{-1} exist? Explain. If M^{-1} exists, find M^{-1}.

Problem 3. (10pts) Use 'the method of inverses' to solve the following system of linear equations:

$$\begin{aligned} 2x - 9y &= -15 \\ -7x + 4y &= 25 \end{aligned}$$