

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.

$$\begin{pmatrix} 1 & 0 & 0 & 0 & 1 \\ 0 & 1 & 1 & 0 & 2 \\ 0 & 0 & 0 & 1 & 1 \\ 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 \end{pmatrix}$$

**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:

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