

## HOMEWORK 6 - MATH 110

DUE DATE: Friday, October 18

INSTRUCTOR: George Voutsadakis

Read each problem very carefully before starting to solve it. Each problem is worth 3 points. It is necessary to show your work. Correct answers without explanations are worth 0 points.

GOOD LUCK!!

1. Solve the  $2 \times 2$  system of equations

$$\begin{cases} 2x - y = 3 \\ x - 3y = -1 \end{cases}.$$

2. Solve the  $2 \times 2$  systems

$$\begin{cases} x + 4y = 2 \\ 3x + 12y = 8 \end{cases} \quad \text{and} \quad \begin{cases} x - 2y = 3 \\ 5x - 10y = 15 \end{cases}$$

3. Use the method of **Gauss Elimination** that was presented in class to solve the system of equations

$$\begin{cases} x - y = 3 \\ -4x + y = 3 \end{cases}.$$

4. Two college students organizing a party, in which they are expecting 18 participants, went to their neighborhood store and bought a few six packs of CoorsLight<sup>®</sup> and a few six packs of Budweiser<sup>®</sup>. The six pack of Coors costs \$3, whereas the six pack of Budweiser costs \$5. The two friends joined finances and reasoning and they figured that they have available \$35 for the beer and that each of the participants will probably consume around 3 bottles of whichever beer they are offered. Can you help them decide how many six packs of each beer they should buy?

5. Let

$$A = \begin{bmatrix} 1 & -2 \\ 3 & 5 \end{bmatrix}, \quad B = \begin{bmatrix} -2 & -1 \\ 5 & 7 \end{bmatrix}.$$

Compute  $A + B$ ,  $A - B$  and  $2A - 3B$ .

6. Is the matrix  $A$  given in number 5 invertible? If yes, can you find its inverse  $A^{-1}$  and verify that  $AA^{-1} = A^{-1}A = I$ ?