

Group: _____

Name: _____

ma138 Worksheet 10, October 3rd, 2017

Use Gaussian elimination to solve the linear systems. If a system has infinitely many solutions, use parameters for the free variables to describe all solutions.

1.

$$\begin{cases} 7x + 2y = 14 \\ 6x + 4y = 20 \end{cases}$$

2.

$$\begin{cases} 2x - 6y = -3 \\ -4x + 12y = 6 \end{cases}$$

3. (Express your answer in terms of b_1 and b_2)

$$\begin{cases} 2x + 5y = b_1 \\ x + 3y = b_2 \end{cases}$$

4.

$$\begin{cases} x - 5y + z & = -157 \\ 2x + 3z & = 144 \\ 3x - 4y - z & = -161 \end{cases}$$

5. Below is the augmented matrix for a linear system with variables x_1, x_2, x_3, x_4 and x_5 . Luckily for you, the matrix is already in reduced row echelon form. All that's left to do is identify the free variables and the pivot variables, and use them to write all possible solutions to the linear system.

$$\left[\begin{array}{ccccc|c} 1 & 0 & 4 & 0 & 3 & 8 \\ 0 & 1 & 3 & 0 & -2 & -8 \\ 0 & 0 & 0 & 2 & 5 & 6 \\ 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 \end{array} \right]$$