

MAT 1302E, Fall 2011

Assignment 1

Professor: Catalin Rada

Due date: September 27, 2011

For all of the questions below, you must show each step in any row reduction and state what operation you are performing at each step.

1. **(5 points)** Solve the following system. Check your answer.

$$\begin{aligned} -x_1 - 2x_2 - x_3 &= -\frac{3}{2} \\ x_1 + x_2 &= \frac{1}{2} \\ 2x_1 + 2x_2 + x_3 &= 1 \end{aligned}$$

2. **(4 points)** Determine if the system corresponding to the following augmented matrix is consistent or inconsistent (you do not need to completely solve the system if it is consistent).

$$\left[ \begin{array}{cccc|c} 3 & 1 & 3 & 1 & 0 \\ 3 & 3 & 2 & 6 & 2 \\ 6 & 4 & 5 & 7 & 5 \end{array} \right]$$

3. **(6 points)** Find the general solution of the following system. Indicate which variables are basic and which are free. Check your answer.

$$\begin{aligned} x_1 &+ 2x_3 + 3x_4 = -5 \\ x_1 + x_2 + 3x_3 + 2x_4 &= -3 \\ 2x_1 + 3x_2 + 9x_3 + 9x_4 &= -4 \end{aligned}$$