

## Quiz 1

NOTE: Answers without proper justification will receive NO credit

Problem 1. (2 points) Find three numbers whose sum is 34, when the sum of the first and second is 7, and the sum of the second and third is 22.

$$\begin{cases} x_1 + x_2 + x_3 = 34 \\ x_1 + x_2 = 7 \\ x_2 + x_3 = 22 \end{cases} \xrightarrow{\substack{E_1 \rightarrow E_1 - E_2 \\ E_3 \rightarrow E_3 - E_1}} \begin{cases} x_3 = 34 - 7 = 27 \\ x_1 + x_2 = 7 \\ x_1 = 34 - 22 = 12 \end{cases} \rightsquigarrow \begin{cases} x_2 = 7 - x_1 = 7 - 12 \\ = -5 \end{cases}$$

$$\text{Soln: } x_1 = 12, x_2 = -5, x_3 = 27$$

Problem 2. (3 points) Find the unique reduced echelon form of the augmented matrix associated

to the system: 
$$\begin{cases} x_1 + x_3 + x_4 - 2x_5 = 1 \\ 2x_1 + x_2 + 3x_3 - x_4 + x_5 = 0 \\ 3x_1 - x_2 + 4x_3 + x_4 + x_5 = 1 \end{cases}$$

$$B = \left[ \begin{array}{ccccc|c} 1 & 0 & 1 & 1 & -2 & 1 \\ 2 & 1 & 3 & -1 & 1 & 0 \\ 3 & -1 & 4 & 1 & 1 & 1 \end{array} \right] \xrightarrow{\substack{R_2 \rightarrow R_2 - 2R_1 \\ R_3 \rightarrow R_3 - 3R_1}} \left[ \begin{array}{ccccc|c} 1 & 0 & 1 & 1 & -2 & 1 \\ 0 & 1 & 1 & -3 & 5 & -2 \\ 0 & -1 & 1 & -2 & 7 & -2 \end{array} \right]$$

$$\xrightarrow{R_3 \rightarrow R_3 + R_2} \left[ \begin{array}{ccccc|c} 1 & 0 & 1 & 1 & -2 & 1 \\ 0 & 1 & 1 & -3 & 5 & -2 \\ 0 & 0 & 2 & -5 & 12 & -4 \end{array} \right] \xrightarrow{R_3 \rightarrow R_3/2} \left[ \begin{array}{ccccc|c} 1 & 0 & 1 & 1 & -2 & 1 \\ 0 & 1 & 1 & -3 & 5 & -2 \\ 0 & 0 & 1 & -5/2 & 6 & -2 \end{array} \right]$$

$$\xrightarrow{\substack{R_1 \rightarrow R_1 - R_3 \\ R_2 \rightarrow R_2 - R_3}} \left[ \begin{array}{ccccc|c} 1 & 0 & 0 & 7/2 & -8 & 3 \\ 0 & 1 & 0 & -1/2 & -1 & 0 \\ 0 & 0 & 1 & -5/2 & 6 & -2 \end{array} \right] \quad \underline{\text{REF!}}$$

Bonus Problem. (1 point) Write the name of another student in this class, other than yourself.