

You must show all your work to receive credit. Calculators are allowed.

Problem 1: (3 points) Find scalars  $x, y, z$  that satisfy

$$x \begin{bmatrix} 1 \\ 1 \\ 1 \end{bmatrix} + y \begin{bmatrix} 0 \\ 1 \\ 2 \end{bmatrix} + z \begin{bmatrix} 2 \\ 3 \\ 2 \end{bmatrix} = \begin{bmatrix} -1 \\ 0 \\ 3 \end{bmatrix}$$

system is 
$$\begin{bmatrix} 1 & 0 & 2 \\ 1 & 1 & 3 \\ 1 & 2 & 2 \end{bmatrix} \begin{bmatrix} x \\ y \\ z \end{bmatrix} = \begin{bmatrix} -1 \\ 0 \\ 3 \end{bmatrix}$$

augmented matrix 
$$\left[ \begin{array}{ccc|c} 1 & 0 & 2 & -1 \\ 1 & 1 & 3 & 0 \\ 1 & 2 & 2 & 3 \end{array} \right]$$

rref is 
$$\left[ \begin{array}{ccc|c} 1 & 0 & 0 & 1 \\ 0 & 1 & 0 & 2 \\ 0 & 0 & 1 & -1 \end{array} \right]$$

Solution :

$$\begin{array}{l} x = 1 \\ y = 2 \\ z = -1 \end{array}$$