Math 441 Name_____
Exam I
Fall 11 SHOW ALL WORK

1) Solve the given systems of linear equations by Gaussian elimination or Gauss Jordan elimination.

a) $x - 5y + 4z = -3$
$2x - 7y + 2z = -3$
$-2x + y + 9z = -1$

$$\left[\begin{array}{ccc|c} 1 & -5 & 4 & -3 \\ 2 & -7 & 2 & -3 \\ -2 & 1 & 9 & -1 \end{array}\right] \rightarrow \left[\begin{array}{ccc|c} 1 & -5 & 4 & -3 \\ 0 & 3 & -6 & 3 \\ 0 & -9 & 17 & -7 \end{array}\right]$$

$$\rightarrow \left[\begin{array}{ccc|c} 1 & -5 & 4 & -3 \\ 0 & 1 & -2 & 1 \\ 0 & -9 & 17 & -7 \end{array}\right] \rightarrow \left[\begin{array}{ccc|c} 1 & 0 & -6 & 2 \\ 0 & 1 & -2 & 1 \\ 0 & 0 & -1 & 2 \end{array}\right] \rightarrow \left[\begin{array}{ccc|c} 1 & 0 & 0 & -10 \\ 0 & 1 & 0 & -3 \\ 0 & 0 & 1 & -2 \end{array}\right]$$

$(-10, -3, -2)$

check $-10 + 15 - 8 = -3$
$-20 + 21 - 4 = -3$ ✓
$20 - 3 - 18 = -1$

b) $x - 2y - z = 0$
$-2x + 4y + 5z = 3$
$3x - 6y - 6z = 2$

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

$$\left[\begin{array}{ccc|c} 1 & -2 & -1 & 0 \\ 0 & 0 & 1 & 1 \\ 0 & 0 & -3 & 2 \end{array}\right] \rightarrow \left[\begin{array}{ccc|c} 1 & -2 & 0 & 1 \\ 0 & 0 & 1 & 1 \\ 0 & 0 & 0 & 5 \end{array}\right]$$

no solution