Lesson 4

1. Calculate

a) $\begin{vmatrix} 3 & 1 \\ 2 & 5 \end{vmatrix}$

b) $\begin{vmatrix} 9 & -4 \\ 5 & 3 \end{vmatrix}$

c) $\begin{vmatrix} -2 & -1 \\ 8 & 4 \end{vmatrix}$

d) $\begin{vmatrix} 4 & 0 & -1 \\ 2 & 2 & 3 \\ -4 & 1 & 1 \end{vmatrix}$

e) $\begin{vmatrix} 2 & 0 & -1 \\ 4 & 1 & 2 \\ 6 & 1 & 1 \end{vmatrix}$

2. Solve inequalities:

a) $\begin{vmatrix} x+2 & -3 \\ 2x & 4 \end{vmatrix} \leq 2$

b) $\begin{vmatrix} 1 & 1 & 1 \\ 1 & 2-x & 1 \\ 1 & 1 & 3+x \end{vmatrix} \geq 0$

3. Solve using Cramer's rule:

a) $\begin{matrix} 2x - 3y = 5 \\ -x + 2y = -3 \end{matrix}$

b) $\begin{matrix} x + y + z = 1 \\ 2x - y + z = -2 \\ 4x + y + z = 4 \end{matrix}$

c) $\begin{matrix} x + y + z = 6 \\ 2x - 4y + z = -3 \\ 3x - y - z = -2 \end{matrix}$

d) $\begin{matrix} 2x + 3y + 2z = 2 \\ x + y + 2z = -1 \\ 2x + 4y = 6 \end{matrix}$

e) $\begin{matrix} x + y - z = 5 \\ 2x - y + z = 4 \\ 4x + y - z = 0 \end{matrix}$

A matrix is in reduced row-echelon form if it satisfies the following: In each row, the left-most nonzero entry is 1 and the column that contains this 1 has all other entries equal to 0. This 1 is called a leading 1. The leading 1 in the