**Lesson 4**

1. Calculate

a) $\left|\begin{matrix}3&1\\2&5\end{matrix}\right|$

b) $\left|\begin{matrix}9&-4\\5&3\end{matrix}\right|$

c) $\left|\begin{matrix}-2&-1\\8&4\end{matrix}\right|$

d) $\left|\begin{matrix}4&0&-1\\2&2&3\\-4&1&1\end{matrix}\right|$

e) $\left|\begin{matrix}2&0&-1\\4&1&2\\6&1&1\end{matrix}\right|$

2. Solve inequalities:

a) $\left|\begin{matrix}x+2&-3\\2x&4\end{matrix}\right|\leq 2$

b) $\left|\begin{matrix}1&1&1\\1&2-x&1\\1&1&3+x\end{matrix}\right|\geq 0$

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



