Homework 1

1. Use row operations to transform the following matrices to their reduced row echelon forms (RREF). Make sure to specify the operations you use at each step.

(a)		(e)	
	$\begin{vmatrix} 1 & 2 \\ 3 & 4 \end{vmatrix}$		$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$
(h)			$\begin{bmatrix} 0 & 0 & 1 & -2 & -3 \\ -1 & -7 & -4 & 2 & 7 \end{bmatrix}$
(D)	$\begin{bmatrix} 2 & 1 & 0 \\ 0 & 0 & 1 \end{bmatrix}$	(f)	
	$\begin{bmatrix} -3 & 2 & 1 \end{bmatrix}$		$\begin{bmatrix} 2 & -4 & 2 \\ 3 & 4 & 5 \end{bmatrix}$
(c)	[0 0 1]		$\begin{vmatrix} 3 & -4 & 5 \\ 0 & 1 & 1 \end{vmatrix}$
			$\begin{bmatrix} -3 & 5 & -4 \end{bmatrix}$
	$\begin{bmatrix} 1 & 0 & 0 \end{bmatrix}$	(g)	
(d)	$\begin{bmatrix} -1 & 2 & 0 \end{bmatrix}$		$ \begin{bmatrix} 1 & 3 & 9 & 2 & -1 \\ 1 & 0 & 3 & -4 & 3 \end{bmatrix} $
			$\begin{bmatrix} 0 & 1 & 2 & 3 & -1 \\ 2 & 2 & 0 & 5 & -1 \end{bmatrix}$
	$\begin{bmatrix} 0 & 1 & -2 \end{bmatrix}$		$\begin{bmatrix} -2 & 3 & 0 & 5 & 4 \end{bmatrix}$

2. Solve the following systems of linear equations.

(a)

$$\begin{cases} x - 5y = 1\\ 3x - 7y = 5 \end{cases}$$
(d)

$$\begin{cases} x + 3y + 5z = 7\\ 3x + 5y + 7z = 9\\ 5x + 7y + 9z = 1 \end{cases}$$

(b)

$$\begin{cases}
x - 3y = 5 \\
-x + y + 5z = 2 \\
y + z = 0
\end{cases}$$
(c)

$$\begin{cases}
x - 3y + 4z = -4 \\
3x - 7y + 7z = -8 \\
-4x + 6y - z = 7
\end{cases}$$

$$\begin{cases} x_1 - 7x_2 + 6x_4 &= 5\\ x_3 - 2x_4 &= -3\\ -x_1 + 7x_2 - 4x_3 + 2x_4 &= 7 \end{cases}$$

(f)

(f)
$$\begin{cases} x+y &= 1\\ y+z &= 2\\ z+x &= 3\\ x-y-2z &= 4 \end{cases}$$