Math 54 Worksheet 1

1. Solve the following system of equations:

$$3x_1 + 6x_2 = -3$$
$$5x_1 + 7x_2 = -2$$

2. For the following systems of equations
(1)Find an echelon form of the augmented matrix
(2)Find the reduced echelon form of the augmented matrix
(3)Determine if the system is consistent or not
(4)Find the solutions to the original equations
a.

$$x_2 + 4x_3 = -5$$
$$x_1 + 3x_2 + 5x_3 = -2$$
$$3x_1 + 7x_2 + 7x_3 = 6$$

b.

$$x_1 + 3x_2 + 6x_3 = 8$$
$$x_1 + 3x_2 + 5x_3 = 7$$
$$2x_1 + 6x_2 + 13x_3 = 17$$

c.

$$4x_1 + 8x_2 - 4x_3 = 8$$
$$-2x_1 - 8x_2 + 2x_3 = 0$$
$$3x_1 + 5x_2 + 3x_3 = 1$$

3. Determine the value(s) of h such that the matrix is the augmented matrix of a consistent linear system.

$$\begin{bmatrix} 1 & 4 & -1 \\ 3 & h & -6 \end{bmatrix}$$

4. Suppose we have a system of 2 equations of 2 unknowns. Can this system have (1) infinite solutions? (2) A unique solution?(3) No solutions?
5. Suppose we have a system of 3 equations of 2 unknowns. Can this system have (1) infinite solutions? (2) A unique solution?(3) No solutions?
6. Suppose we have a system of 2 equations of 3 unknowns. Can this system have (1) infinite solutions? (2) A unique solution?(3) No solutions?
*7. Suppose a,b,c,d are constants, and the following system is consistent for any f and g. What can you say about the numbers a,b,c,d?

$$\begin{bmatrix} a & b & f \\ c & d & g \end{bmatrix}$$