Math 310
Assignment # 1

1. For each of the following find all solutions to the system of equations do the following: i) write down the coefficient matrix for the system, ii) write down the augmented matrix for the system, iii) do Gauss-Jordan elimination on the augmented matrix, iv) use the previous part to write down a solution set for the system of equations

   (a)

$$3x + 6y - 3z = 9$$
$$2x - 2y - 2z = 1$$

   (b)

$$2x_1 + 2x_4 = 6$$
$$x_1 + x_2 + x_3 + x_4 = 7$$
$$3x_3 + 3x_4 = 1$$

   (c)

$$3x_1 + 2x_2 + 3x_3 - x_4 = 1$$
$$3x_1 + x_3 + 4x_4 = 20$$
$$3x_1 + x_3 - 3x_4 = 11$$
$$2x_1 - 2x_2 + x_3 + 4x_4 = 14$$

2. Let A and B be $n \times n$ matrices.

   (a) Use the distributive law (twice) to expand the quantity $(A + B)(A - B)$.

   (b) Explain why $(A + B)(A - B)$ need not equal $A^2 - B^2$ (as it does for real numbers).