

## Math 320 Linear Algebra Assignment # 1

1. For each of the following find all solutions to the system of equations do the following:

### USING ROW REDUCTION TO SOLVE A LINEAR SYSTEM

1. Write the augmented matrix of the system.
2. Use the row reduction algorithm to obtain an equivalent augmented matrix in echelon form. Decide whether the system is consistent. If there is no solution, stop; otherwise, go to the next step.
3. Continue row reduction to obtain the reduced echelon form.
4. Write the system of equations corresponding to the matrix obtained in step 3.
5. Rewrite each nonzero equation from step 4 so that its one basic variable is expressed in terms of any free variables appearing in the equation.

(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. Find the coefficients  $a, b$  and  $c$  so that the graph of  $f(x) = ax^2 + bx + c$  passes through the points  $(1, 6)$ ,  $(-1, 16)$  and  $(2, 10)$ . You may use any method you want.