## Problem 1

a)

Linear dependent since we have a\_2 = -2a\_1 - a\_3

b)

i) just prove (A(B+C))\_ij = (AB + BC)\_ij.

ii) (ABC)^T = (A(BC))^T = (BC)^T A = C^T B^T A^T

c) We choose to solve the second set of linear equation, since it produces all integer elements in **L**

the lower triangular matrix **L** is [[2,0,0],[-1,3,0],[1,0,1]] and the **x** is [1,2,4]

## Problem 2

a)

Similar to 98’s paper, the l\_2 norm is 5.

b) don’t think we are taught this anymore

c) same as 98’s paper

## 

## Problem 3

a)

same as 98’s paper

b)

similar to 98’s paper

c)

A^-1 = [[1,c],[0,b^-1]]

where for every element c\_i = sigma k =1 to n (a\_k \* b^-1\_ki)

## Problem 4

a)

minimam is (0,-1).

The hessian is [[2,0],[0,-2y]]

b)

The proof is trivial.

But what is the usefulness of this………….!!!

Generalisation:

If the i-th column is different from the identity matrix **I**, then the b\_i needs to be 0 so that we have **Ab = b.**

c)

proof seems to be trivial if I am not mistaken.