1i). Linear transformation T: U V is a function that carries element of the vector space U(domain) to vector space V(co-domain) and which has 2 properties:

Additive property: T(U1 + U2) = T(U1) + T(U2)

Multiplicative property: T(αU) = αT(U)

ii). Rank of a matrix is the dimension of the vector space generated by it’s columns. It is also the maximum number of linearly independent column vectors in the matrix.

2). X = 1 2 8

 4 7 6

 9 5 3

/X/ = 1 2 8

 4 7 6

 9 5 3

/X/ = 1 7 6 - 2 4 6 + 8 4 7

 5 3 9 3 9 5

/X/ = 1(21 – 30) – 2 (12 – 54) + 8(20 – 63)

/X/ = - 9 + 84 – 344

/X/ = - 269

/X/≠ 0 , therefore, X is a non-singular matrix

3). T: X Y

 X Y

 e . . 2

 f . . 4

 g . . 6

 h . . 8

 i . . 10

 j .

 k.

 Domain Co-domain

 T(e) = 4

 T(f) = 2

 T(g) = 6

 T(h) = 10

 T(j) = 8