MATRICES

What should be the condition of Identity Matrix

A*A-1=I

If any Matrix is having inverse of same

So there will be three conditions:-

1. Determinant of A!=0
2. It should be square matrix i.e 2*2 or 3*3 ant etc.
3. AB=BA=I

If B is inverse of A and A is inverse of B then it will give you Identity Matrix.

4*1/4=1.

So by using this concept

Lets solve this equation by using Matrix method

4x+2y=8

5x+3y=11

MATRICES

[4 2]   [x]= [8]
[5 3]   [y]   [11]

A   X   B

:- A is Coefficient of Unknown variable and B Is scalar or constant values.

1. AX=B   ---Eq.(1)
2. Can we multiply A-1 at both sides, So we will get

AA-1B=A-1B

We can club it by using Associativity Rule.

IX=A-1B

X=A-1B

Lets find A-1 by considering as a=4,b=2,c=5,d=3

A-1=1/(ad-bc)[d -b]
                    [-c   a]

MATRICES

1. =1/2[2]
   [4]

   Or X=1 and Y=2

   Lets put values of x and y in equations

   4*1+2*2=8

   This is solution for particular equation

Q1. X1+X2+X3=3
X1-X2 =0
X1-X2+X3 =1 Solve this 3*3 Matrix

MATRICES

Solve this by using the A-1 formula as

A-1=Adj(A)/|A|-1

Linear Trabsformation

Let take U(f) and V(f) are two vector spaces
A mappingF: such that U→ V is called Linear Transformation of u into v if

1. f(x+y)=f(x)+f(y)
2. 2.f(ax)=a.f(x)

x,y belongs to U

f(x) and f(y) are the elements of V
The mapping who will satisfy these two conditions will be called as linear transformations

LINEAR TRANSFORMATION

How we can solve this:

T.V3(R)→ V2(R) by

T(x1,x2,x3)=(x1-x2,x1+x3)

Let
(x1,x2,x3)=x belongs to V3
Whereas x1 and x2 are points

T(x+y)=T[(x1,x2,x3) + (y1,y2,y3)]
=T[(x1+y1, x2+y2, x3+y3)]
X1 X2 X3

AS per formula
=T[(x1+y1-x2-y2,x1+x3+y1+y3)]
Rearrange the points
=T[(x1-x2+y1-y2,x1+x3+y1+y3)]
So we can add X coordinates in X and Y coordinates in Y as per dimensions

LINEAR TRANSFORMATION

$(x1-x2,x1+x3) +(y1-y2,y1+y3)$

$T(x1,x2,x3) +T(y1,y2,y3)$
$T(x)+T(y)$

2) Let we take 2^{nd} condition

$T(ax)=T[a(x1,x2,x3)]$
$T(ax1,ax2,ax3)$

If it will multiplied that a with x1,x2,x3
ax1 will become x coordination and other y and z

$=T[(ax1-ax2),(ax1+ax3)]$
$=a(x1-x2,x1+x3)$
$aT(x)$
Hence T is Linear Transformation