2014 APRIL 20 Sunday Wk - 16 • 110-255

Unit-5
Matrices and solution of Linear Equations.

* Solve following equation by Gauss elimination:

7 am

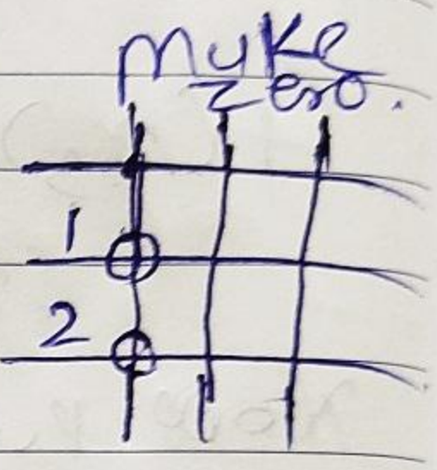
$x - y + 2z = 3$

8 $x + 2y + 3z = 5$

$3x - 4y - 5z = -13$

9 Sol:- Now Augmented Matrix.

10 $$[A|B] = \begin{bmatrix} 1 & -1 & 2 & : & 3 \\ 1 & 2 & 3 & : & 5 \\ 3 & -4 & -5 & : & -13 \end{bmatrix}$$



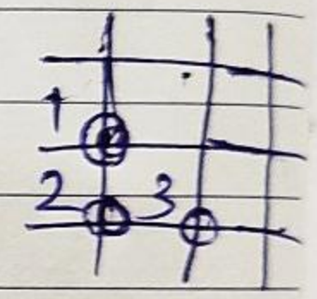
11

Now,

12 $R_2 \to R_2 - R_1$

$R_3 \to R_3 - 3R_1$

$$= \begin{bmatrix} 1 & -1 & 2 & : & 3 \\ 0 & 3 & 1 & : & 2 \\ 0 & -1 & -11 & : & -22 \end{bmatrix}$$



1 pm

Now,

2 $R_3 \to 3R_3 + R_2$

$$= \begin{bmatrix} 1 & -1 & 2 & : & 3 \\ 0 & 3 & 1 & : & 2 \\ 0 & 0 & -32 & : & -64 \end{bmatrix}$$

3

Now $1x - 1y + 2z = 3$ ——— (1)

4 $0x + 3y + 1z = 2$ ——— (2)

$0x + 0y - 32z = -64$. ——— (3)

5

From eqn. (3), $-32z = 64$

6 $z = 2$

7 Now, Put z in eqn. (2), $3y + 2 = 2 \Rightarrow y = 0$

Now, Put y and z in eqn. (1),

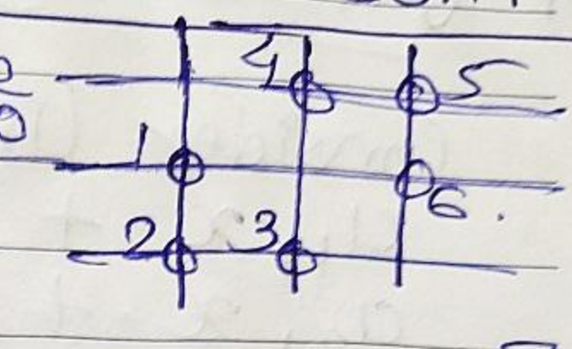
$x - 0 + 2(2) = 3$

$x = -1$

* Solve the ~~system~~ equition using (Gauss Jordon Method)

$2x + y + z = 10$
$3x + 2y + 3z = 18$
$x + 4y + 9z = 16.$

make zero



Sol:-

$x + 4y + 9z = 16$
$2x + y + z = 10$
$3x + 2y + 3z = 18$

$$[A|B] = \begin{bmatrix} 1 & 4 & 9 & : & 16 \\ 2 & 1 & 1 & : & 10 \\ 3 & 2 & 3 & : & 18 \end{bmatrix}$$

Now,

$R_2 \to R_2 - 2R_1$
$R_3 \to R_3 - 3R_1$

$$= \begin{bmatrix} 1 & 4 & 9 & : & 16 \\ 0 & -7 & -17 & : & -22 \\ 0 & -10 & -24 & : & -30 \end{bmatrix}$$

Now,

$R_3 \to 7R_3 - 10R_2$
$R_1 \to 7R_1 + 4R_2$

$$= \begin{bmatrix} 7 & 0 & -5 & : & 24 \\ 0 & -7 & -17 & : & -22 \\ 0 & 0 & 2 & : & 10. \end{bmatrix}$$

Now,

$R_1 \to 2R_1 + 5R_3$
$R_2 \to 2R_2 + 17R_3$

$$= \begin{bmatrix} 14 & 0 & 0 & : & 98 \\ 0 & -14 & 0 & : & 126 \\ 0 & 0 & 2 & : & 10 \end{bmatrix}$$

Now.

$14x = 98 \Rightarrow x = 7$
$-14y = 126 \Rightarrow y = -9$
$2z = 10 \Rightarrow z = 5.$

Two heads are better than one. But not if both are stupid.