## + ULTIMATE MATHEMATICS + U

Sclutions of D-3 PAGE
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$$\frac{O_{NS}\cdot 1}{hau} + \frac{1}{3}y = 5 \quad \text{and} \quad 2x + 6y = 8$$

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1A1= 6-6=0 Now we have check (A of A) B

$$AOJA = \begin{bmatrix} 6 & -3 \\ -2 & 1 \end{bmatrix}$$

$$|A| = 6 - 6 = 0 \quad \text{New we have check } (A \text{ od} A) B$$

$$A \text{ of } A = \begin{bmatrix} 6 & -3 \\ -2 & 1 \end{bmatrix} \begin{bmatrix} 5 \\ 8 \end{bmatrix} = \begin{bmatrix} 30 - 24 \\ -10 + 8 \end{bmatrix} = \begin{bmatrix} 6 \\ -2 \end{bmatrix} \neq 0$$

$$\therefore \text{ Symmetric in } \text{ In constant } \text{ (Mispeint in work sheet)} = 0$$

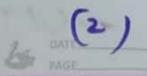
$$0n2 + 91cm - 4uahors$$
  
 $3x - y - 2z = 2$ ,  $0x + 2y - z = -1$ ,  $3x - 5y = 3$ 

$$A = \begin{bmatrix} 3 & -1 & -2 \\ 0 & 2 & -1 \\ 3 & -5 & 0 \end{bmatrix}, B = \begin{bmatrix} 2 \\ -1 \\ 3 \end{bmatrix}$$

$$A = \begin{bmatrix} -5 & 10 & 5 \\ -3 & 6 & 3 \\ -6 & 12 & 6 \end{bmatrix}$$

Since 1A10 and AMA) B +0 = In consident Any

## (D-3) Solution



ON13+ 9rum equations 5x-y+xz=5; 2x+3y+5z=2; 5x-2y+6z=-1 hen  $A = \begin{bmatrix} 5 & -1 & 7 \\ 2 & 3 & 5 \\ 5 & -2 & 6 \end{bmatrix}$ ;  $B = \begin{bmatrix} 5 \\ 2 \\ 1 \end{bmatrix}$ 1A = 5 (18 +10) +1 (12-25) +4 (-4-15) - 140-13-76 = 51 +0 -- Systam is consistent Ans ON 6 + Grun equations in (proper form) then eyapon can be weeten in the form  $\begin{bmatrix} 1 & -1 & 2 \\ 3 & 4 & -5 \\ 2 & -1 & 3 \end{bmatrix} \begin{bmatrix} x \\ y \end{bmatrix} = \begin{bmatrix} 7 \\ -5 \\ 12 \end{bmatrix}$ (0) A X=B Where  $A = \begin{bmatrix} 1 & -1 & 2 \\ 3 & 4 & -5 \end{bmatrix}$ ,  $X = \begin{bmatrix} 2 \\ 2 \end{bmatrix}$ ;  $B = \begin{bmatrix} 7 \\ -8 \\ 12 \end{bmatrix}$ 1A = 1(12-5) +1(9+10) +2(-3-8) = 7 +19 -22 = 4 to E have unique solyhon 

$$A^{-1} = \frac{1}{141} \cdot AoJA$$

$$A^{-1} = \frac{1}{4} \cdot \begin{pmatrix} 7 & 1 & -3 \\ -19 & -1 & 11 \\ -11 & -1 & 7 \end{pmatrix}$$

we have AXEB => X = A-13

$$= \begin{cases} 49 - 5 - 36 \\ -133 + 5 + 132 \\ -77 + 5 + 84 \end{cases}$$

$$\begin{bmatrix} y \\ y \\ z \end{bmatrix} = 4 \begin{bmatrix} 8 \\ 4 \\ 12 \end{bmatrix}$$

=> x=2, y=1, Z=3 is fur Reyand Solution Ms.

Ous 4 and ON 5 -> same as One No 6 (Doyanusey)

these equations can be wellfon in the fair

$$\begin{bmatrix} 2 & 3 & 10 \\ 4 & -6 & 5 \\ 6 & 9 & -20 \end{bmatrix} \begin{bmatrix} 1/2 \\ 1/2 \end{bmatrix} = \begin{bmatrix} 4 \\ 1 \\ 2 \end{bmatrix}$$

(or ) A X = B

Les (4)

$$A = \begin{bmatrix} 2 & 3 & 10 \\ 4 & -6 & 5 \\ 6 & 9 & -20 \end{bmatrix} \quad ; B = \begin{bmatrix} 4 \\ 1 \\ 2 \end{bmatrix} \quad ; X = \begin{bmatrix} 1/x \\ 1/y \\ 1/z \end{bmatrix}$$

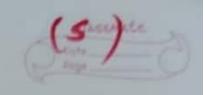
:- System. as consistent and have unique solution

$$A \times = B$$

$$= Y \times = A^{-1}B$$

$$\begin{bmatrix}
\frac{1}{1} \\ \frac{1}{1} \\ \frac{1}{2}
\end{bmatrix} = \begin{bmatrix} \frac{1}{1} \\ \frac{1}{3} \\ \frac{1}{4} \\ \frac{1}{5} \end{bmatrix} = \frac{1}{1} = \frac{1}{2} = \frac{1}{$$

# (Q3) Selutions



ON 8 + SILM Equatory

242 - 342 + 344 = 10442

342 - 42 + 44 = 10442

342 - 42 + 244 = 13442

Pivole all these equations by XXZ

2 -3 +3 =10

女+ + + = 10

录一女十章=13

Proceed Barne as ONS No. 7 (Re yoursey)

 $xs.9 + 9icm A = \begin{bmatrix} 2 & -3 & 5 \\ 3 & 2 & -4 \\ 1 & 1 & -2 \end{bmatrix}$ 

1A1= 2(-4+4) +3(-6+4) +5(3-2)

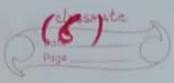
(1)= 0-6+5=-1

 $AdyA = \begin{bmatrix} 0 & -1 & 2 \\ 2 & -9 & 23 \\ 1 & -5 & 13 \end{bmatrix}$ 

 $A^{-1} = -\frac{1}{7} \begin{bmatrix} 0 & -1 & 2 \\ 2 & -9 & 23 \\ 1 & -9 & 13 \end{bmatrix} = \begin{bmatrix} 0 & 1 & -2 \\ -2 & 9 & -23 \\ -1 & 5 & -13 \end{bmatrix}$ 

2x-3y+5z=11; 3x+2y-4z=-5 and x+y-2z=-3

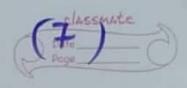
#### (0-3) Solutions



their equations can be written in the form A X=B when  $X = \begin{bmatrix} X \\ Y \\ 2 \end{bmatrix}$ ,  $B = \begin{bmatrix} 11 \\ -5 \\ -5 \end{bmatrix}$  $\Rightarrow X = A^{-1}B$   $\Rightarrow X = \begin{bmatrix} 0 & 1 & -2 \\ -2 & 9 & -23 \end{bmatrix} \begin{bmatrix} 11 \\ -5 \\ -1 & 5 & -13 \end{bmatrix} \begin{bmatrix} -3 \\ -3 \end{bmatrix}$ = X = 0-5+6 -21 - 45 + 69 -11 -25 +39 7 7 = 2 ANG = x=1, y=2, z=3 is the Refyrad Solution ON 10+ let tue three numbers are Y, Y, Z According to alushan x+y+z=6 ---(i) y + 3z = 11 - (z)  $x + z = 2y \Rightarrow x - 2y + z = 0$ New to yoursey  $0 \times 11$  given  $A = \begin{bmatrix} 1 & -1 & 1 \\ 2 & 1 & -3 \\ 1 & 1 & 1 \end{bmatrix}$ 

|A| = |(1+3)| + |(2+3)| + |(2-1)|

#### (D-3) Solutions



Adj 
$$A = \frac{4}{5} + 1 = 10$$

Adj  $A = \begin{bmatrix} 4 & 2 & 2 \\ -5 & 0 & 5 \\ 1 & -2 & 3 \end{bmatrix}$ 

A<sup>-1</sup>=  $\begin{cases} 1 & 2 & 2 \\ -7 & 0 & 5 \\ 1 & -2 & 3 \end{cases}$ 

Silven equations  $\begin{cases} 1 & 2 & 2 \\ -7 & 0 & 5 \\ 1 & -2 & 3 \end{cases}$ 

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All  $\begin{cases} 1 & 2 & 2 \\ -7 & 0 & 5 \\ 1 & -2 & 3 \end{cases}$ 

Silven equations  $\begin{cases} 1 & 2 & 2 \\ 2 & -3 & 7 \\ 1 & -2 & 3 \end{cases}$ 

All  $\begin{cases} 1 & 2 & 2 \\ 2 & -3 & 7 \\ 1 & -2 & 3 \end{cases}$ 

Silven equations  $\begin{cases} 1 & 2 & 2 \\ 2 & -3 & 7 \\ 2 & -2 & 7 \\ 2 & -3 & 7 \end{cases}$ 

All  $\begin{cases} 1 & 2 & 2 & 2 \\ 2 & -3 & 7 \\ 2 & 2 & -3 \\ 2 & 3 & 7 \end{cases}$ 

All  $\begin{cases} 1 & 2 & 2 & 2 \\ 2 & -3 & 7 \\ 2 & 2 & -3 \\ 2 & 3 & 7 \end{cases}$ 

And  $\begin{cases} 1 & 2 & 2 & 2 \\ 2 & -3 & 7 \\ 2 & 2 & -3 \\ 2 & 3 & 7 \end{cases}$ 

And  $\begin{cases} 1 & 2 & 2 & 2 \\ 2 & -3 & 7 \\ 2 & 2 & -3 \\ 2 & 3 & 7 \end{cases}$ 

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And  $\begin{cases} 1 & 2 & 2 & 2 \\ 2 & -3 & 7 \\ 2 & 3 & 7 \\ 2 & 3 & 7 \end{cases}$ 

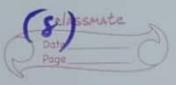
And  $\begin{cases} 1 & 2 & 2 & 2 \\ 2 & 3 & 7 \\ 2 & 3 & 7 \\ 2 & 3 & 7 \end{cases}$ 

And  $\begin{cases} 1 & 2 & 2 & 2 \\ 2 & 3 & 7 \\ 2 & 3 & 7 \\ 2 & 3 & 7 \end{cases}$ 

And  $\begin{cases} 1 & 2 & 2 & 2 \\ 2 & 3 & 7 \\ 2 & 3 & 7 \\ 2 & 3 & 7 \\ 2 & 3 & 7 \end{cases}$ 

And  $\begin{cases} 1 & 2 & 2 & 2 \\ 2 & 3 & 7 \\ 2 & 3 & 7 \\ 2 & 3 & 7 \\ 2 & 3 & 7 \\ 3 & 3 & 7 \\ 3 & 3 & 7 \\ 3 & 3 & 7 \\ 3 & 3 & 7 \\ 4 & 3 & 7 \\ 3 & 3 & 7 \\ 4 & 3 & 7 \\ 3 & 3 & 7 \\ 4 & 3 & 7$ 

#### (D-3) Seluhans



ON 12 + lef cost of omion 15 Rs x / kg

cost of wheat is Rs x / kg

cost of Rice is R1 z / kg According to Question 4x+3y+2Z = 60 2x + 4y + 6z = 90 6x + 2y + 37 = 70 Now proceed yourself ON 13+ let  $A = \begin{bmatrix} 1 & -1 & 2 \\ 0 & 2 & -3 \end{bmatrix}$  \( \begin{align\*} \begin{align\*} \begin{align\*} \begin{align\*} -2 & 0 & 1 \\ 9 & 2 & -3 \\ 3 & -2 & 4 \end{align\*} \end{align\*} \) to find AC  $AC = \begin{pmatrix} 1 & -1 - 2 \\ 0 & 2 & -3 \\ 3 & -2 & 4 \end{pmatrix} \begin{pmatrix} -2 & 0 & 1 \\ 9 & 2 & -3 \\ 6 & 1 & -2 \end{pmatrix}$ AC = [ 0 0 0 ]

[AC = I]

[AC = I]

La form thus equation we can find A-1 ATAC = ATS (Per-mushply by AT) 

# (D.3) Schikery (9)



gun elughan
x-y+22=1 ; 0x+2y-32=1 & 3x-2y+42=2
then equations can be written in the form
A X = B
=> X = A-1B alwardy found
= X=A-B already found
9 2 -3 1
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$
- (-2+0+2)
9+2-6 6 +1-4
]= ( 0 ) =+ N=0, Y=5, Z=) ANS
] [ 3
14+ Do yoursey (some as Ono No= 13)
14+ Do yoursey (some as Ono No=13)
+ 91 ven A = [7 2 -6] & B = [1 -2 0]
-2 $1$ $-3$ $1$ $1$ $1$ $1$ $1$ $1$ $1$ $1$ $1$ $1$
1-425 LO-21/
fired BA
pred 12/7
BA = [ -2 -3
7 3 -4 2 8
0 72 1
= 1 0 0
0 11 0
-11/0/0

BA= III

## (0-3) solution



Jun ejughons x-2y=10; 2x+y+3z=8 and 0x-2y+Z=7 these equations can be wellen in the form  $\begin{bmatrix} 1 & -2 & 0 \\ 2 & 1 & 3 \\ 0 & -2 & 1 \end{bmatrix} \begin{bmatrix} 7 \\ 7 \\ 7 \end{bmatrix} = \begin{bmatrix} 10 \\ 8 \\ 7 \end{bmatrix}$ BX=C where  $B = \begin{bmatrix} 1 & -2 & 0 \\ 2 & 1 & 3 \\ 0 & -2 & 1 \end{bmatrix}$ ;  $X = \begin{bmatrix} 4 \\ 9 \\ 2 \end{bmatrix}$ ;  $C = \begin{bmatrix} 10 \\ 9 \\ 7 \end{bmatrix}$ we already forms here we have to find B' (not A') B-BA = 11 B-I -- ( Plem 47 hply by B-1) A= 113-1 B-1= HA  $B^{1} = \frac{1}{11} \begin{bmatrix} 7 & 2 & -6 \\ -2 & 1 & -3 \\ -4 & 2 & 5 \end{bmatrix}$ we have Bx= C  $X = \frac{1}{11} \left[ \begin{array}{c} 7 & 2 & -6 \\ -2 & 1 & -3 \\ -4 & 2 & 7 \end{array} \right] \left[ \begin{array}{c} 10 \\ 8 \\ 7 \end{array} \right] = \frac{1}{11} \left[ \begin{array}{c} 70 + 16 - 42 \\ -20 + 8 - 21 \\ -40 + 16 + 137 \end{array} \right]$ = [4] = 71=4 = [-3] = 71=4 = -3 | Amg