

# Mohammad Ali Jinnah University Chartered by Government of Sindh - Recognized by HEC

## **Assignment 1**

Name: Muhamad Fahad

**Id:** FA19-BSSE-0014

Subject: Linear Algebra (Fall 2020)

**Section:** AM

**Teacher:** Dr. Asmat Ara

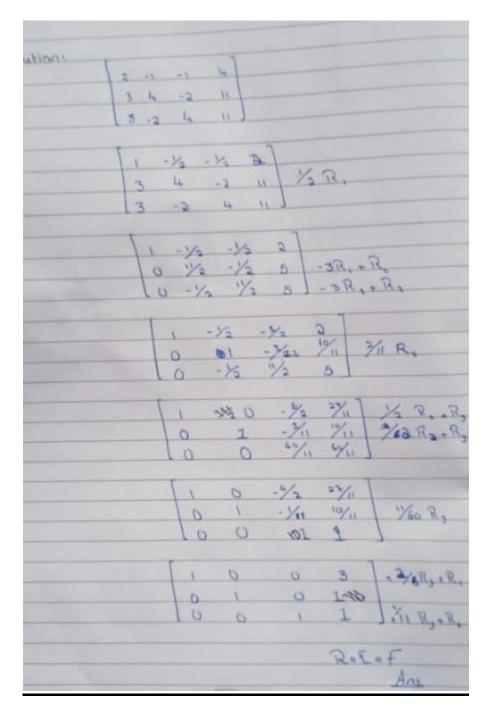
Date: Wednesday, October 28, 2020

#### Attempt all questions.

Q.1 (a) Evaluate the matrix

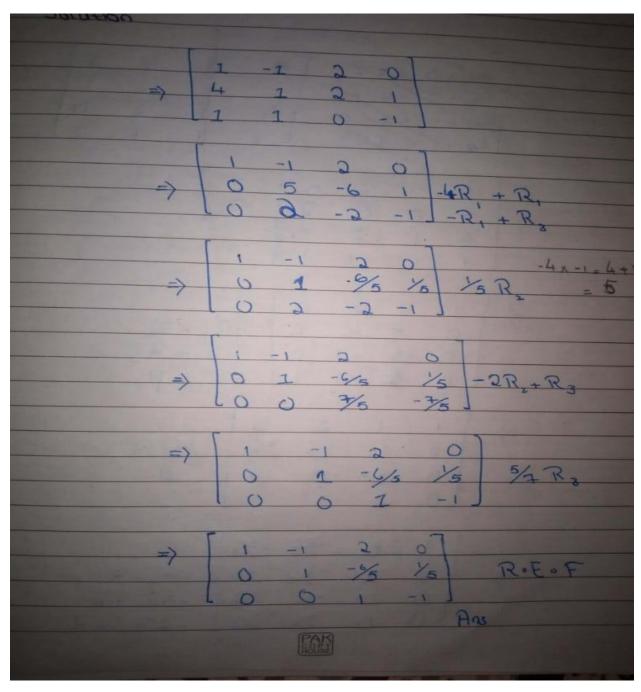
$$\begin{bmatrix} 2 & -1 & -1 & 4 \\ 3 & 4 & -2 & 11 \\ 3 & -2 & 4 & 11 \end{bmatrix}$$
 into Reduced Echelon form.

#### **Solution:**



(b) Evaluate the matrix

$$\begin{bmatrix} 1 & -1 & 2 & 0 \\ 4 & 1 & 2 & 1 \\ 1 & 1 & 1 & -1 \end{bmatrix} \text{ into Echelon form.}$$



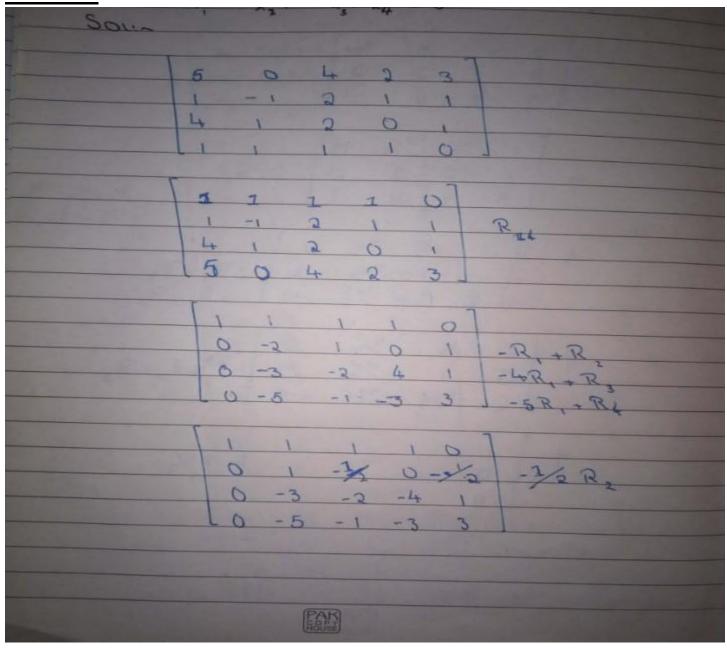
Q.2 Solve the following system by Gaussian Jordan method.

$$5x_1 + 4x_3 + 2x_4 = 3$$

$$x_1 - x_2 + 2x_3 + x_4 = 1$$

$$4x_1 + x_2 + 2x_3 = 1$$

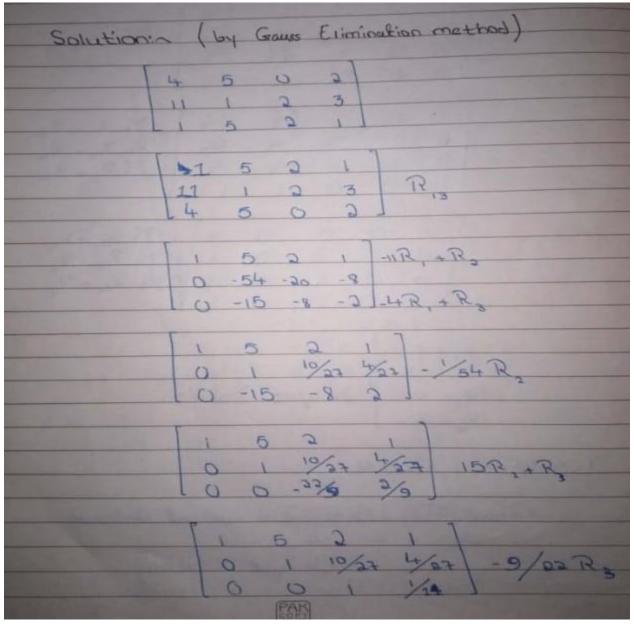
$$x_1 + x_2 + x_3 + x_4 = 0$$

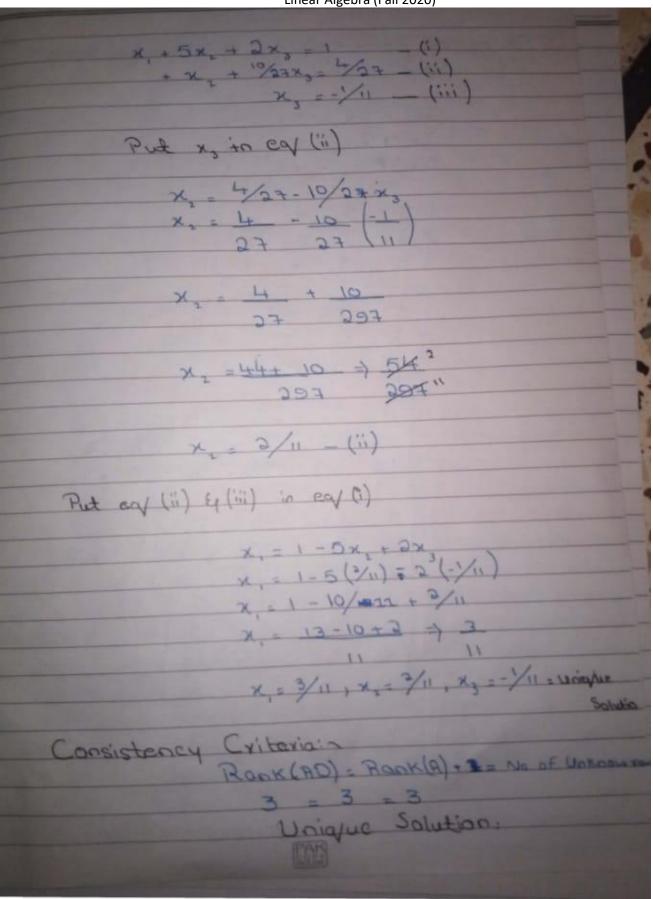


	Linear Algebra (Fall 2020)	
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1	0 1 -1/2 0 -1/2	3R . R
	0 0 - 1/2 - 4 - 1/2	5R, R,
	0 0 - 22 -3 1/2	1-R2 +R,
	10 3/2 1 3/7	
	0 1 -15 0 -3	7 7 K3
	0018/1/3	7.00
	0 0 1/2 -3 1/3	
	1 0 0 -54 3/	7 7 R, + R.
	0 1 0 4/2 -3/	1 /2 R3 + R4
	0 0 1 8/7 /3	-3/2 R3 + R4
	0 0 0 1 1	1 2 1/3 + 1/4
	0 0 1 1	
	10001	1 -8/7 R4+R3
	01001	-1/2 Ru+R3
	10010-1	5/2 R4 + R3
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Q.3 Solve by elementary row operations.

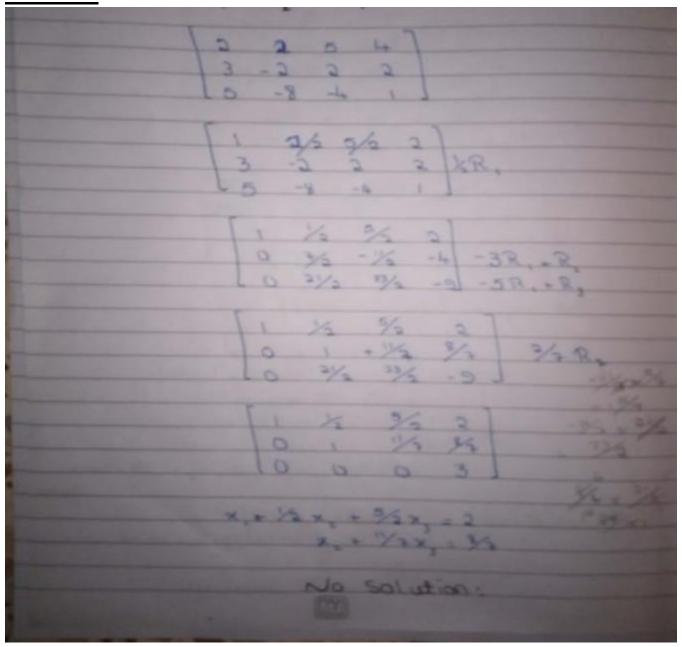
$$4x + 5y = 2$$
$$11x + y + 2z = 3$$
$$x + 5y + 2z = 1$$

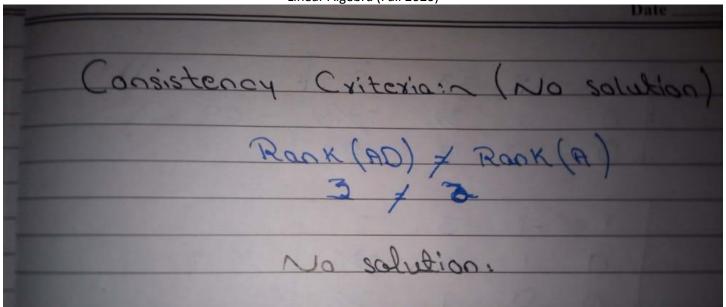




Q.4 Solve by elementary row operations. (by Gauss Elimination)

$$2x_1 + x_2 + 5x_3 = 4$$
$$3x_1 - 2x_2 + 2x_3 = 2$$
$$5x_1 - 8x_2 - 4x_3 = 1$$



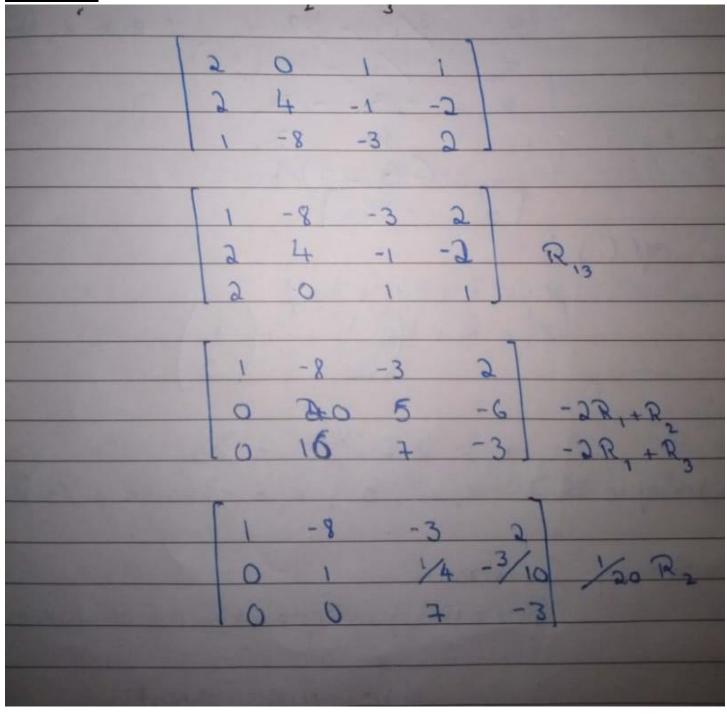


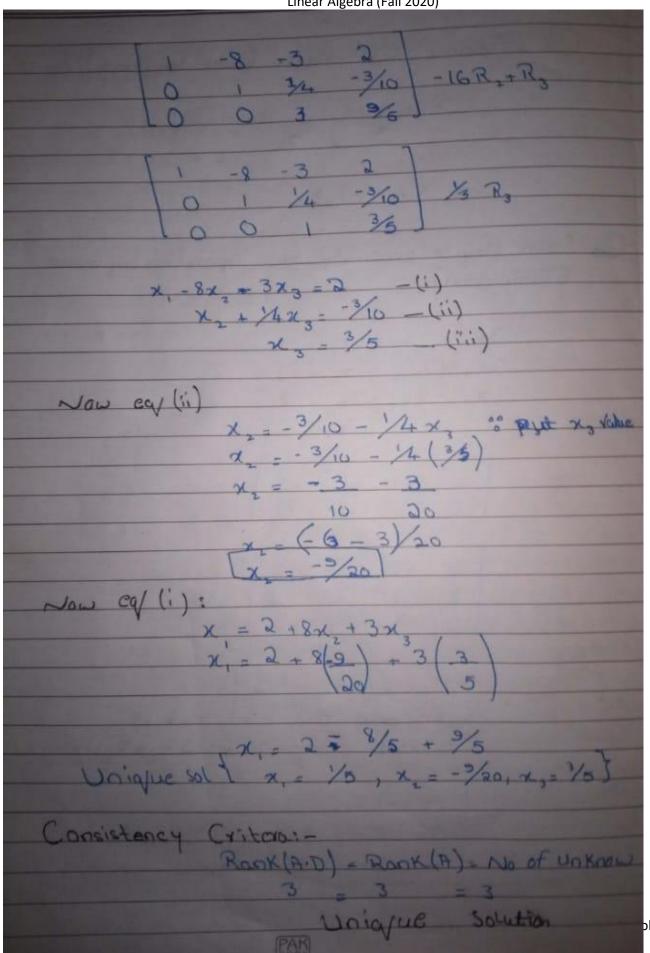
Q.5 Solve by elementary row operations. (by Gauss Elimination)

$$2x_1 + x_3 = 1$$

$$2x_1 + 4x_2 - x_3 = -2$$

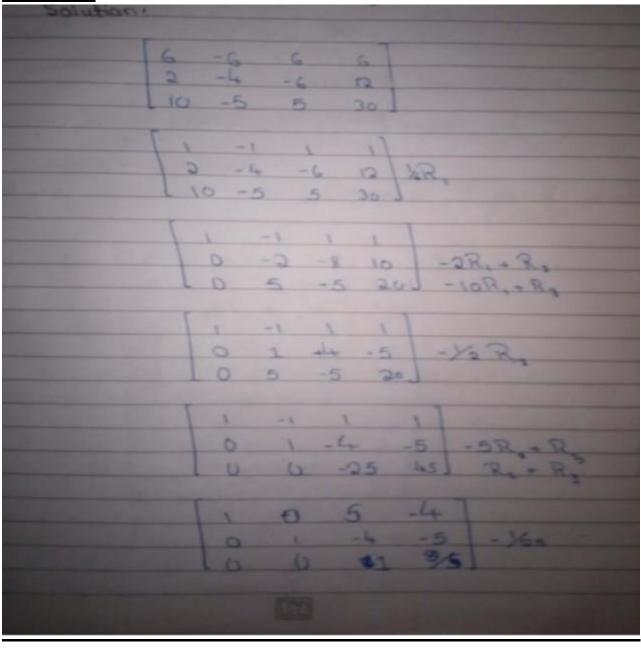
$$x_1 - 8x_2 - 3x_3 = 2$$

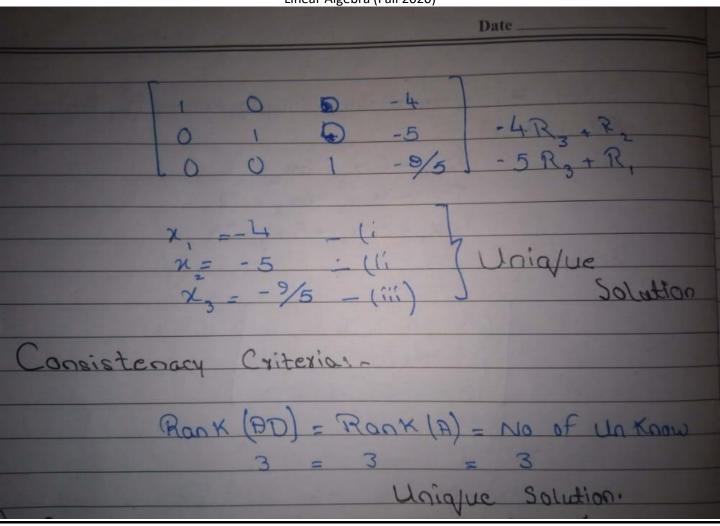




Q.6 Solve by elementary row operations. (by Gauss Jordan)

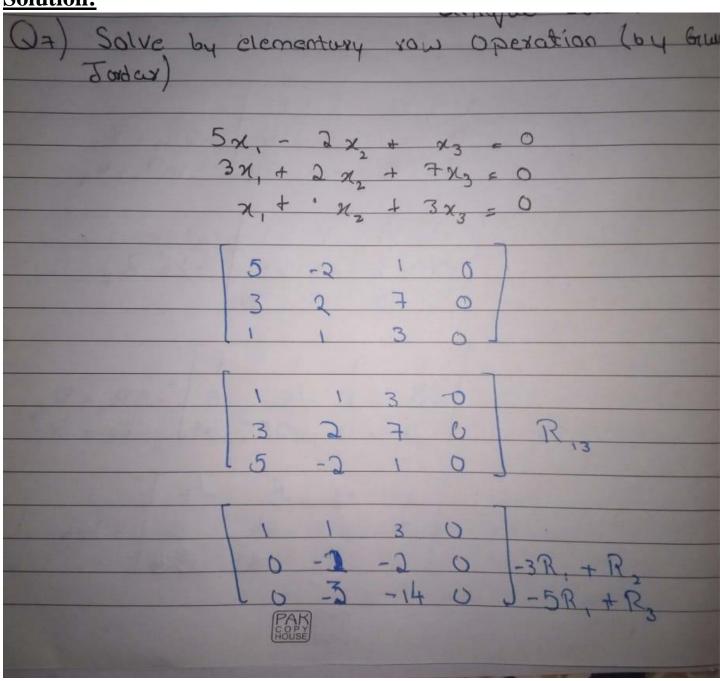
$$6x_1 - 6x_2 + 6x_3 = 6$$
$$2x_1 - 4x_2 - 6x_3 = 12$$
$$10x_1 - 5x_2 + 5x_3 = 30$$

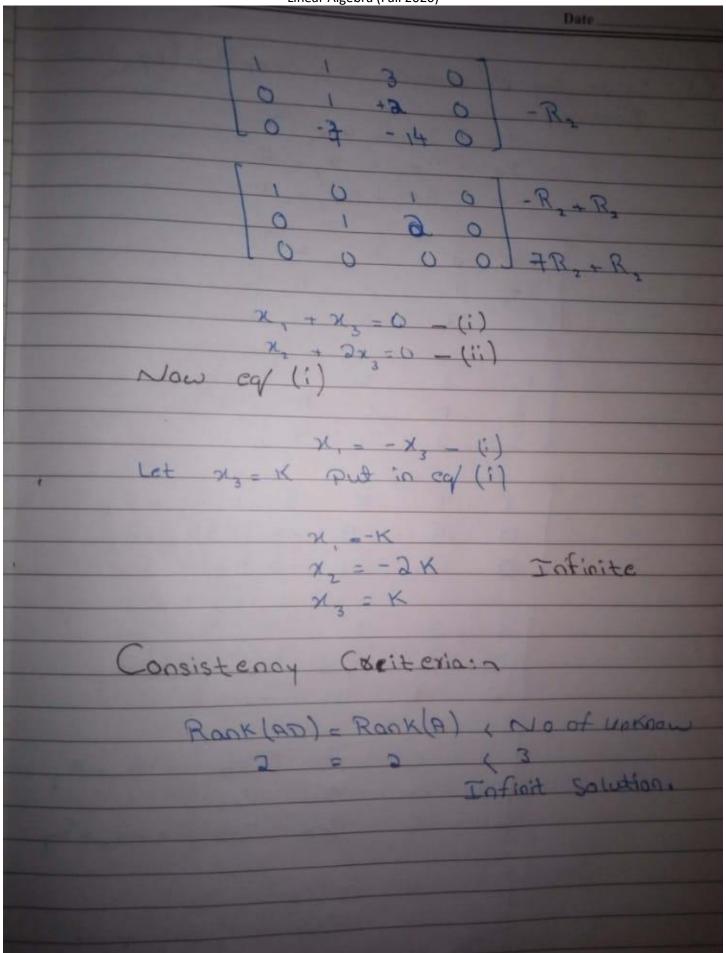




Q.7 Solve by elementary row operations. (by Gauss Jordan)

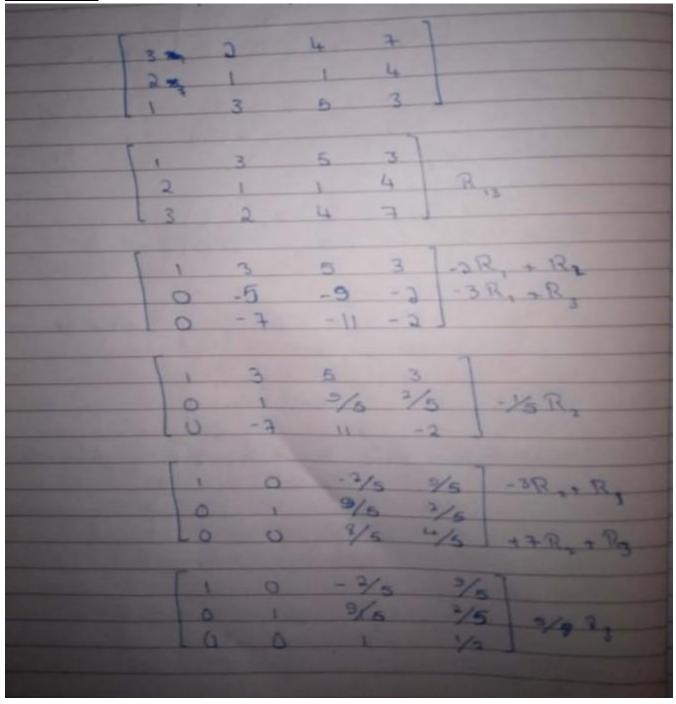
$$5x_1 - 2 x_2 + x_3 = 0$$
$$3x_1 + 2 x_2 + 7x_3 = 0$$
$$x_1 + x_2 + 3x_3 = 0$$





Q.8 Solve by elementary row operations. (by Gauss Jordan)

$$3x_1 + 2x_2 + 4x_3 = 7$$
$$2x_1 + x_2 + x_3 = 4$$
$$x_1 + 3x_2 + 5x_3 = 3$$



Linear Algebra (Fall 2020)		
Date		
0 1 0 0 3 - 3/5 R3+R, 0 1 0 - 1/2 3/3 R37 R3		
$\frac{\chi_{1}=2}{\chi_{2}=-\frac{1}{2}}$ Unique Solution		
Consistency Critexia:		
$\frac{Rank(AD) = Rank(A) = also of unknown}{3 = 3 = 3}$ Unique Solution		