

# UNIVERSIDAD MARIANO GALVEZ DE GUATEMALA CENTRO UNIVERSITARIO DE JALAPA FACULTAD DE INGENIERIA

Alumno/a: Esvin Giovanni González de la Cruz Carné: 0907-22-12653

Asignatura:	Algebra Lineal	Código:	0907-007	Semestre:	Segundo		
Ciclo:	Segundo	Segundo					
Catedrático:	Ing. M.A. Samuel de Jesús G	Ia	rea 8				

## Sistemas de Ecuaciones por Matrices Inversas

Resuelva por el método de Matriz Inversa los siguientes Sistemas de Ecuaciones:

1. 3x + 2y - z = 4 X - 2y + 2z = 32x + y - 2z = -2

$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	1) 3	5x + 2y x - 2 y x + y	- z = 4 + 2z = 3 = -2z = -2	A= (3 2 - 2 1 - 2	1 / 4 2 b= 3 2 -2	$X = \begin{pmatrix} x \\ y \\ z \end{pmatrix}$
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	A= 1-	2-1 2 2 =	F1 4-2=2 -2-4=-6	-4 - (-1) -6 - (-2):	= -3 4	F <sub>3</sub> -2 = 2 -(41) = 7
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	∆*= (	2-6	5 \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	6 5 \ A 9 (A)*	2 3 2 6 -4 -7	
$X = \begin{vmatrix} y \\ z \end{vmatrix} = \begin{vmatrix} 6/13 & -4/13 & -\frac{7}{13} \\ 5/13 & 1/18 & -8/13 \end{vmatrix} = \begin{vmatrix} 2 \\ 3 \end{vmatrix}$	Δ-			7 = 8	6/13 -4/13 5/18 1/13	- <del>7</del> /13 -8/13
X = 2/13 X 4 + 3/13 X 3 + 2/13 X (-2) = 7	X =	y = (	5/13 -4/	3 -8/13	3 =	(2)
$y = \frac{6}{13} \times 4 + \frac{-4}{13} \times 3 + \frac{-9}{13} \times (-2) = 2$ $Z = \frac{5}{13} \times 4 + \frac{1}{13} \times 3 + \frac{-8}{13} \times (-2) = 3$		y = (	6/13 x 4 +	-4/13 ×3+	-4/13 x C-2.	)= 2

2.

$$x_1 + x_2 + x_3 = 6$$

$$-2x_1 + x_2 - x_3 = -5$$

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

	-2)	(1 t	X	_	X3 X3 2X3	=	-5		A=		1 -2 -1	1 1 2	1 -1 -2	1	b =	-	6 5 1		X=	X1 X2 X3
			-2	+	1+	(-	4)	-(	(-1)	) -	(-2)	) -	4=	-6		IAI	=	-6	#	3
	1 -2 -1	1 1 2	1 -1 -2,	=	+	2-	2		-4		4 -2 -1		-1)		1	2.	-(- -(-	1)	=	3 3
۸*		0 -4	3 -1 1	-3 3		A	*=	0 4	-3 -1 -1	-3 -3 3		()	(*) <sup>t</sup>		0 -3 -3	4 -1 -3 -	-1	1	/	
		1	1 =	1-6		0 -3 -3	4 -1 -3	2	1)	=	1	0 1/2 1/2		2/2		1/3	1	4		
	X	=	X <sub>1</sub> X <sub>2</sub> X <sub>3</sub>	=	(	0 1/2		1/2	1	13/6/2		1	6-5-1				3 2 1	1	4	
		X1	-	0	X	5 +		2/3	X	(-5)	) +	1/	3 X	(	1)	=	3			-
		X2	-	1/2	X	6+	- 1	16)	X C	5)	+	1/6	X	(-	1)-	-	2			
		X3	-	1/2	X	67	-	1/2	X	(-5	)+	-1	12	X (	1-1.	)=	1			

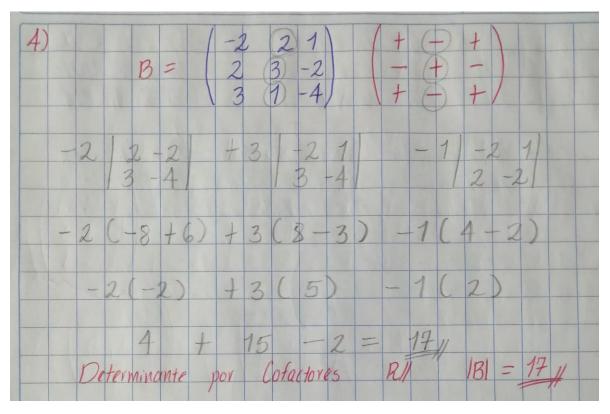
Sean las matrices: 
$$A = \begin{bmatrix} 2 & -4 & 1 \\ -1 & -3 & 2 \\ 3 & 1 & -3 \end{bmatrix}, \quad B = \begin{bmatrix} -2 & 2 & 1 \\ 2 & 3 & -2 \\ 3 & 1 & -4 \end{bmatrix}, \quad C = \begin{bmatrix} -5 & 2 & -1 \\ 3 & -2 & 1 \\ -4 & 2 & 3 \end{bmatrix}$$

#### Resuelva:

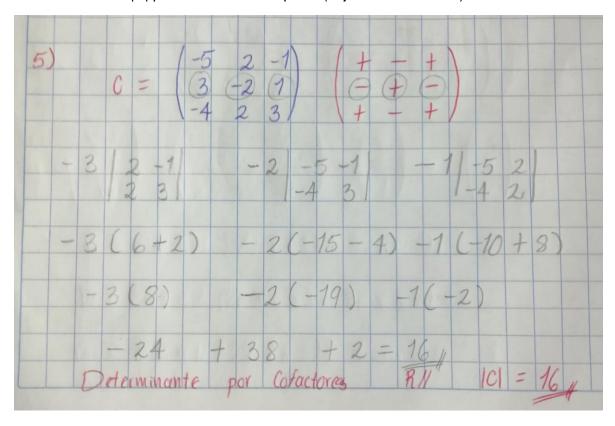
3. Determinante |A| por el método de Laplace (adjunta o cofactores)

3) (2)	(-4) (1)	(+) (+) (+)	= 11 1 11 11 11
3	1-3/	+ - +/	3 81 - 18 - 18 - 18 -
2 1 - 3	2 4	1-1219	1 -1 -2
	3	3 -3	131
	2) + 4	(3-6)+1	(-1+9)
2(5)	1	4(-3) 1	
2(7	7 +	4(-3) +	7(8)
14-	+ (	-12) + 8	= 10 /
	Determinante	por Cofactores	R/ WI = 104

**4.** Determinante |B| por el método de Laplace (adjunta o cofactores)

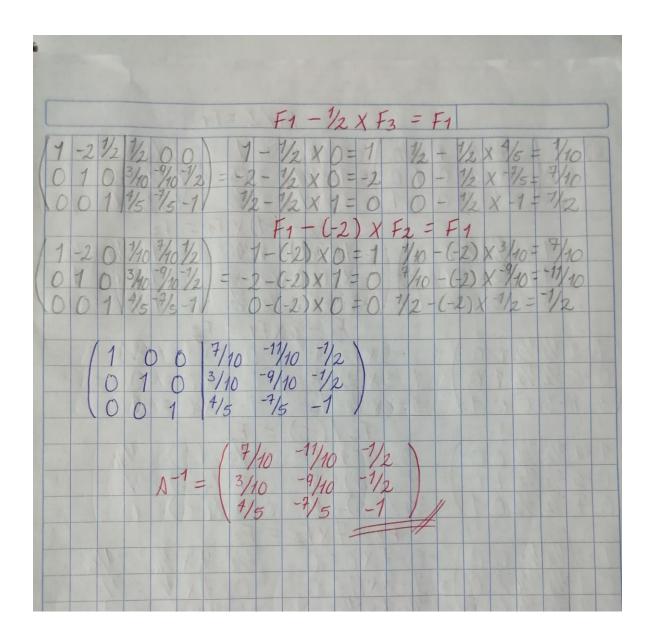


**5.** Determinante |C| por el método de Laplace (adjunta o cofactores)



## **6.** A<sup>-1</sup> por el método de Eliminación de Gauss

-							H	-	12	LX	· V	1-1	F1	12	1, =	F1	-				-		
	6)	0	=	2-13	-4 -3 1-	1 2 -3	100	010	001	=		2-4-1	12	5	-2		0	12	=	0			
		(	7-1-2	-2	1/2	1/2	010	0001			1-	F2 (-1) (-1)	1)X	1 1:	=10		0-	6-1	)X				
	0	-2	1/2 5/2	1/2 1/2	01	0		3	-3	3X	F: 1= 1= 2):	07/2	3;	X F	1 =	3 X	1/2	2 =	-3/0	2	1		
11	1-0-0	-2	1/2 5/2	1/2	0	00	)=	1	01	F 16-	2 / 5)	1 (- - C	5)	=	F2	1	(-5 (-5	)=	-1/	140			
1	7	-2	1/2	1/2	0,1/5	00	)=	C	F ) -!	3 · X	1=	= ( = (	F2		F3 -3/2		XXX	-1/2 -1/2	5 =	- 7	15	-	
1	1.00		1/2		0,1/5	00	)=	7	F	3/	1(	-1) = C	=	F.	3-4/	5/	(-1	1)	=	4/5			
1	1-0	2 1	1/2 1/2	1/2 -1/10	0 -1/5	00		-	FOI	2-1/2	/2 X	1/2 0:	X A	3	= 1/1	F2	1/2	XXX	4/5	= = = =	3/10	0 0	
1	0	0	71	75	15	-1	/		12-	1/2	X	1=	0				12	X	1	= "	14		



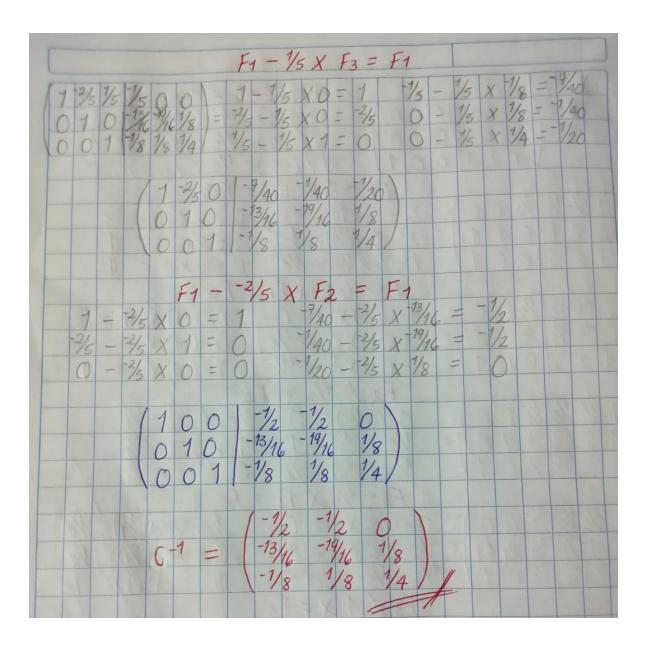
## **7.** B<sup>-1</sup> por el método de Eliminación de Gauss

B =	$F_1/(-2) = F_1$
-22110 23-201 31-400	1/ 1/(-2)= 1/2 0/(-2)= 0
1-1 1/2 1/2 0 2 3-2 0 1 3 1-4 0 0	$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$
1-1/2/20 05-1-11 31-400	0 = 1-3 x(-1)= 4 0-3 x 0 = 0
1-17/27/20 05-111 04 9/2 3/20	$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$
1 -1-1/2 -1/2 0 0 1 -1/5 1/6 1/5 0 4 5/2 3/2 0	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$
1-1-1/2-1/20	$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$
1-1-1/2-1/20	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$
001117	AT 13 13 1 1 - 0 0 13 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

$F_1 - \frac{1}{2} \times F_3 = F_1$
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$
$B^{-1} = \begin{pmatrix} -10/17 & 9/17 & -7/17 \\ 2/17 & 5/17 & -2/17 \end{pmatrix}$
\-\frac{-7}{17} \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \

**8.** C<sup>-1</sup> por el método de Eliminación de Gauss

	THE PROPERTY OF THE PARTY OF TH
$   \begin{array}{c}       8) \\       6 = \begin{pmatrix} -5 \\ 2 \\ -1 \\ 3 \\ -2 \\ 1 \\ 4 \\ 2 \\ 3 \\ 6 \\ 6 \\ \end{array} $	$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$
1 7/5 1/5 1/5 0 0	$F_2 - 3 \times F_1 = F_2$ $3 - 3 \times 1 = 0  0 - 3 \times \frac{1}{5} = \frac{3}{5}$ $= -2 - 3 \times \frac{2}{5} = \frac{1}{5}  1 - 3 \times 0 = 1$ $1 - 3 \times \frac{1}{5} = \frac{2}{5}  0 - 3 \times 0 = 0$
1 2/6 1/5 1/5 0 0 0 1/5 2/5 3/5 1 0 -4 2 3 0 0 1	$F_{3} - (-4) \times F_{1} = F_{3}$ $-4 - (-4) \times 1 = 0  0 - (-4) \times \frac{1}{5} = \frac{1}{5}$ $= 2 - (-4) \times \frac{1}{5} = \frac{2}{5}  0 - (-4) \times 0 = 0$ $3 - (-4) \times \frac{1}{5} = \frac{19}{5}  1 - (-4) \times 0 = 1$
1 2/5 1/5 7/5 0 0 0 (-1/5) 2/5 3/5 1 0 0 2/5 19/5 4/5 0 1	$F_{2}/\frac{4}{5} = F_{2}$ $0/(\frac{4}{5}) = 0  \frac{3}{5}/\frac{4}{5} = \frac{3}{4}$ $= \frac{4}{5}/(\frac{4}{5}) = 1  1/\frac{4}{5} = \frac{5}{4}$ $= \frac{2}{5}/(\frac{4}{5}) = \frac{1}{2}  0/\frac{4}{5} = 0$
1 2/5 1/5 -1/5 0 0 0 1 1/2 -3/4 -5/4 0 0 2/6 19/5 -4/5 0 1	$F_{3} - \frac{2}{5} \times F_{2} = F_{3}$ $0 - \frac{2}{5} \times 0 = 0$ $\frac{4}{5} - \frac{2}{5} \times \frac{3}{4} = \frac{1}{2}$ $\frac{2}{5} - \frac{2}{5} \times 1 = 0$ $0 - \frac{2}{5} \times (\frac{5}{4}) = \frac{1}{2}$ $\frac{19}{5} - \frac{2}{5} \times \frac{1}{2} = 4$ $1 - \frac{2}{5} \times 0 = 1$
1 7/5 1/5 7/5 0 0 0 1 1/2 3/4 5/4 0 0 0 4 1/2 1/2 1	$F_{3} / 4 = F_{3}$ $0 / 4 = 0                               $
1 -2/5 1/5 -1/6 0 0 0 1 -1/2 -3/4 -5/4 0 =	$ \begin{aligned} F_2 - \frac{7}{2} \times F_3 &= F_2 \\ 0 - \frac{7}{2} \times 0 &= 0 & \frac{3}{4} - \frac{7}{2} \times \frac{7}{8} &= \frac{73}{16} \\ &= 1 - \frac{7}{2} \times 0 &= 1 & \frac{5}{4} - \frac{7}{2} \times \frac{7}{8} &= \frac{73}{16} \\ &= \frac{7}{2} - \frac{7}{2} \times 1 &= 0 & 0 - \frac{7}{2} \times \frac{7}{4} &= \frac{73}{8} \end{aligned} $



Ing. M.A. Samuel de Jesús García Docente de Algebra Lineal