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

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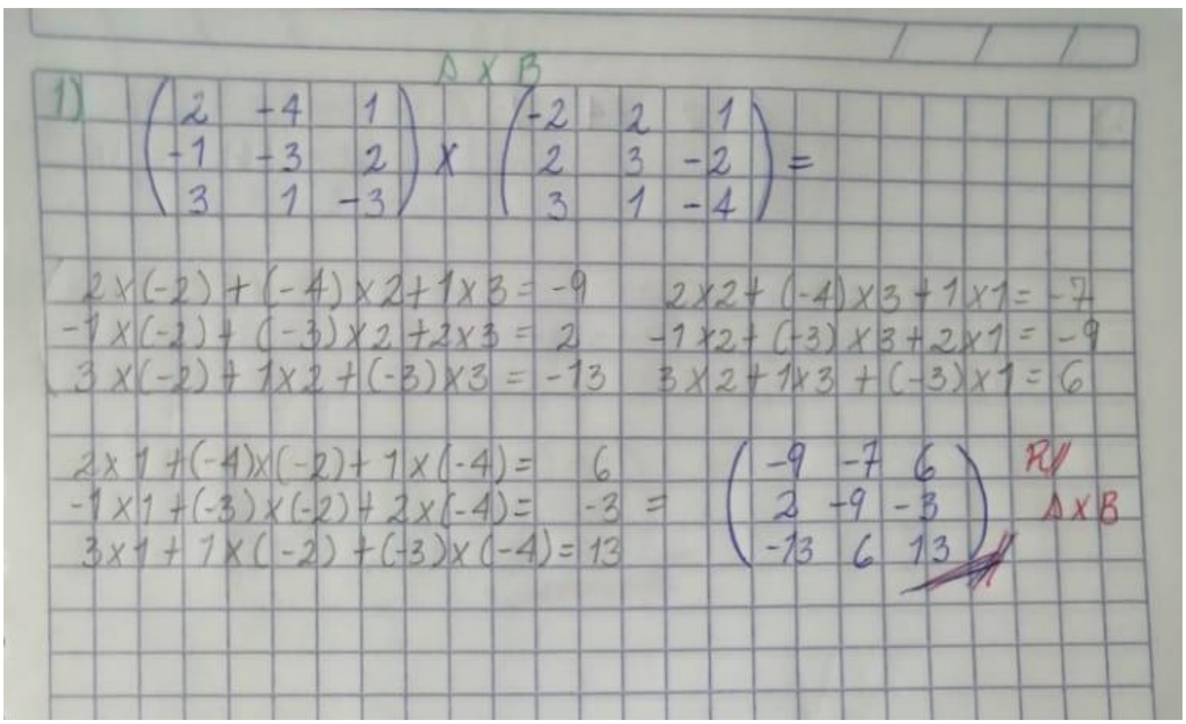
Asignatura:	Algebra Lineal	**Código:**	0907-007	**Semestre:**	Segundo
Ciclo:	Segundo			**Tarea 6**	
Catedrático:	Ing. M.A. Samuel de Jesús García				

Operaciones con Matrices y Determinantes

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

Resuelva:

1 A*B



1) A x B

$$\begin{pmatrix} 2 & -4 & 1 \\ -1 & -3 & 2 \\ 3 & 1 & -3 \end{pmatrix} x \begin{pmatrix} -2 & 2 & 1 \\ 2 & 3 & -2 \\ 3 & 1 & -4 \end{pmatrix} =$$

$2x(-2)+(-4)x2+1x3 = -9$

$-1x(-2)+(-3)x2+2x3 = 2$

$3x(-2)+1x2+(-3)x3 = -13$

$2x2+(-4)x3+1x1 = -7$

$-1x2+(-3)x3+2x1 = -9$

$3x2+1x3+(-3)x1 = 6$

$2x1+(-4)x(-2)+1x(-4) = 6$

$-1x1+(-3)x(-2)+2x(-4) = -3$

$3x1+1x(-2)+(-3)x(-4) = 13$

$$= \begin{pmatrix} -9 & -7 & 6 \\ 2 & -9 & -3 \\ -13 & 6 & 13 \end{pmatrix}$$

R/ A x B

2 B-C

B - C

2) $$\begin{pmatrix} -2 & 2 & 1 \\ 2 & 3 & -2 \\ 3 & 1 & -4 \end{pmatrix} - \begin{pmatrix} -5 & 2 & -1 \\ 3 & -2 & 1 \\ -4 & 2 & 3 \end{pmatrix} =$$

$-2-(-5) = 3$
$2-3 = -1$
$3-(-4) = 7$

$2-2 = 0$
$3-(-2) = 5$
$1-2 = -1$

$1-(-1) = 2$
$-2-1 = -3$
$-4-3 = -7$

R// B-C

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

3 A+C

A+C

3) $$\begin{pmatrix} 2 & -4 & 1 \\ -1 & -3 & 2 \\ 3 & 1 & -3 \end{pmatrix} + \begin{pmatrix} -5 & 2 & -1 \\ 3 & -2 & 1 \\ -4 & 2 & 3 \end{pmatrix} =$$

$2+(-5) = -3$ $\quad -4+2 = -2$ $\quad 1+(-1) = 0$
$-1+3 = 2$ $\quad -3+(-2) = -5$ $\quad 2+1 = 3$
$3+(-4) = -1$ $\quad 1+2 = 3$ $\quad -3+3 = 0$

R// A+C $$\begin{pmatrix} -3 & -2 & 0 \\ 2 & -5 & 3 \\ -1 & 3 & 0 \end{pmatrix}$$

4 $|A|$ Determinante de la Matriz A utilizando los métodos de Sarrus, Tringulo y Eliminación de Gauss.

$$\begin{matrix} 2 & -4 & 1 & 2 & -4 \\ -1 & -3 & 2 & -1 & -3 \\ 3 & 1 & -3 & 3 & 1 \end{matrix}$$

$$A = \begin{pmatrix} 2 & -4 & 1 \\ -1 & -3 & 2 \\ 3 & 1 & -3 \end{pmatrix}$$

$18 + (-24) + (-1) = -7$

$-9 + 4 + (-12) = -17$

$(-7) - (-17) = 10$

Regla de Sarrus R// $|A| = 10$
Determinante

$$A = \begin{pmatrix} 2 & -4 & 1 \\ -1 & -3 & 2 \\ 3 & 1 & -3 \end{pmatrix}$$

Regla de triangulo R// $|A| = 10$
Determinante

$$\begin{matrix} 2 & -4 & 1 \\ -1 & -3 & 2 \\ 3 & 1 & -3 \end{matrix}$$

$18 + (-24) + (-1) = -7$

$-9 + (-12) + 4 = -17$

$(-7) - (-17) = 10$

$$\Delta = \begin{pmatrix} 2 & -4 & 1 \\ -1 & -3 & 2 \\ 3 & 1 & -3 \end{pmatrix} =$$

$$-1 - {}^{-1}\!/_2 \times 2 = 0$$

$$-3 - {}^{-1}\!/_2 \times (-4) = -5$$

$$2 - {}^{-1}\!/_2 \times 1 = {}^5\!/_2$$

$$2\,\frac{1}{2} = \frac{2 \times 2 + 1}{2} = \frac{4+1}{2} = \frac{5}{2}$$

$$\begin{pmatrix} 2 & -4 & 1 \\ 0 & -5 & 5/2 \\ 3 & 1 & -3 \end{pmatrix}$$

$$\Delta = \begin{pmatrix} 2 & -4 & 1 \\ 0 & -5 & 5/2 \\ 3 & 1 & -3 \end{pmatrix} =$$

$$3 - {}^3\!/_2 \times 2 = 0$$

$$1 - {}^3\!/_2 \times (-4) = 7$$

$$-3 - {}^3\!/_2 \times 1 = {}^{-9}\!/_2$$

$$-4\,\frac{1}{2} \quad \frac{4 \times 2 + 1}{2} = \frac{8+1}{2} \quad \frac{9}{2}$$

$$\begin{pmatrix} 2 & -4 & 1 \\ 0 & -5 & 5/2 \\ 0 & 7 & -9/2 \end{pmatrix}$$

$$\Delta = \begin{pmatrix} 2 & -4 & 1 \\ 0 & -5 & 5/2 \\ 0 & 7 & -9/2 \end{pmatrix} =$$

$$0 - {}^7\!/_{-5} \times 0 = 0$$

$$7 - {}^7\!/_{-5} \times (-5) = 0$$

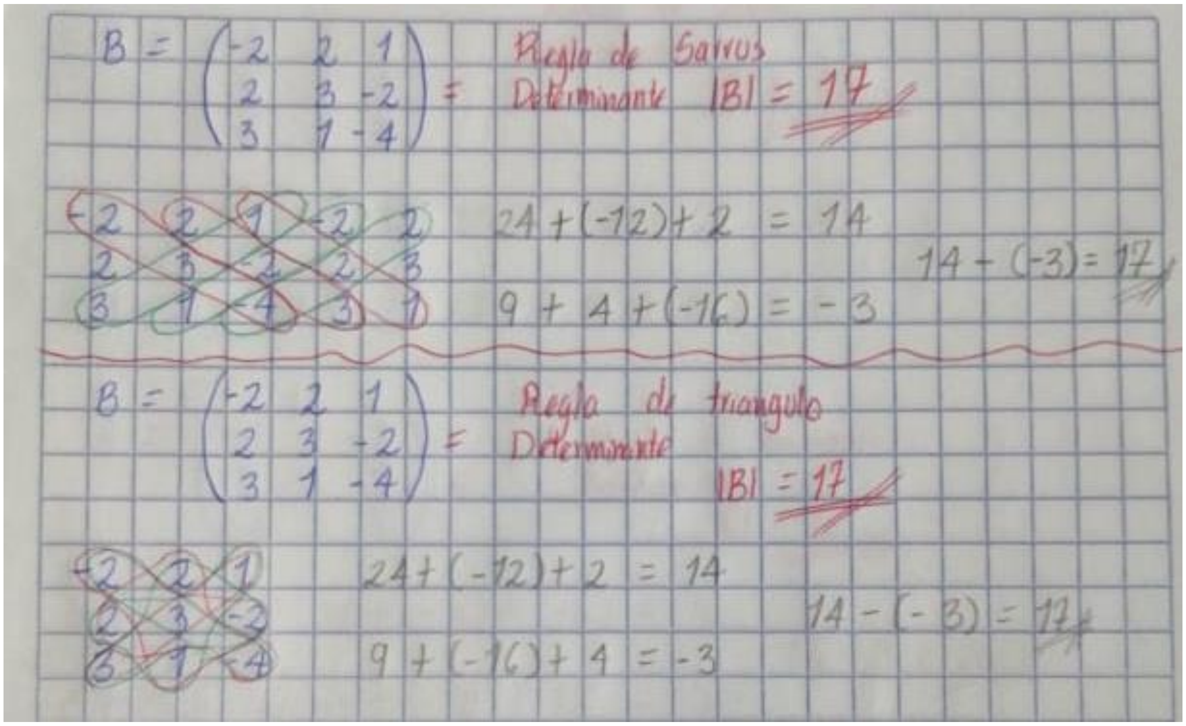
$${}^{-9}\!/_2 - {}^7\!/_{-5} \times {}^5\!/_2 = -1$$

$$\begin{pmatrix} 2 & -4 & 1 \\ 0 & -5 & 5/2 \\ 0 & 0 & -1 \end{pmatrix}$$

$$\Delta = \begin{pmatrix} 2 & -4 & 1 \\ 0 & -5 & 5/2 \\ 0 & 0 & -1 \end{pmatrix} = 2 \times (-5) \times (-1) = 10 \,//$$

Eliminación de Gauss R// $|\Delta| = 10$ //

5 |B| Determinante de la Matriz B utilizando los métodos de Sarrus, Tringulo y Eliminación de Gauss.



$$B=\begin{pmatrix}-2 & 2 & 1\\ 2 & 3 & -2\\ 3 & 1 & -4\end{pmatrix}=$$

$2-\frac{2}{-2}\times(-2)=0$

$3-\frac{2}{-2}\times 2=5$

$-2-\frac{2}{-2}\times 1=-1$

$$\begin{pmatrix}-2 & 2 & 1\\ 0 & 5 & -1\\ 3 & 1 & -4\end{pmatrix}$$

$$B=\begin{pmatrix}-2 & 2 & 1\\ 0 & 5 & -1\\ 3 & 1 & -4\end{pmatrix}=$$

$3-\frac{3}{-2}\times(-2)=0$

$1-\frac{3}{-2}\times 2=4$

$-4-\frac{3}{-2}\times 1=-\frac{5}{2}$

$$\begin{pmatrix}-2 & 2 & 1\\ 0 & 5 & -1\\ 0 & 4 & -\frac{5}{2}\end{pmatrix}$$

$$-2\frac{1}{2}=-\frac{2\times 2+1}{2}=-\frac{4+1}{2}=-\frac{5}{2}$$

$$B=\begin{pmatrix}-2 & 2 & 1\\ 0 & 5 & -1\\ 0 & 4 & -\frac{5}{2}\end{pmatrix}=0-\frac{4}{5}\times 0=0$$

$4-\frac{4}{5}\times 5=0$

$-\frac{5}{2}-\frac{4}{5}\times(-1)=-\frac{17}{10}$

$$\begin{pmatrix}-2 & 2 & 1\\ 0 & 5 & -1\\ 0 & 0 & -\frac{17}{10}\end{pmatrix}$$

$$-1\frac{7}{10}=-\frac{1\times 10+7}{10}=-\frac{10+7}{10}=-\frac{17}{10}$$

$$B=\begin{pmatrix}-2 & 2 & 1\\ 0 & 5 & -1\\ 0 & 0 & -\frac{17}{10}\end{pmatrix}=-2\times 5\times -\frac{17}{10}=17$$

Eliminación de Gauss

$|B|=17$

6 |C| Determinante de la Matriz C utilizando los métodos de Sarrus, Tringulo y Eliminación de Gauss.

Regla de Sarros
Deteíminate

$$C = \begin{pmatrix} -5 & 2 & -1 \\ 3 & -2 & 1 \\ -4 & 2 & 3 \end{pmatrix} =$$

$|C| = 16$

$$\begin{array}{ccccc} -5 & 2 & 1 & -5 & 2 \\ 3 & -2 & 1 & 3 & -2 \\ -4 & 2 & 3 & -4 & 2 \end{array}$$

$30 + (-8) + (-6) = 16$

$-8 + (-10) + 18 = 0$

$16 - 0 = 16$

Regla de triangulo
Determinante

$$C = \begin{pmatrix} -5 & 2 & -1 \\ 3 & -2 & 1 \\ -4 & 2 & 3 \end{pmatrix} =$$

$|C| = 16$

$$\begin{array}{ccc} -5 & 2 & -1 \\ 3 & -2 & 1 \\ -4 & 2 & 3 \end{array}$$

$30 + (-8) + (-6) = 16$

$-8 + (-10) + 18 = 0$

$16 - 0 = 16$

$$C = \begin{pmatrix} -5 & 2 & -1 \\ 3 & 2 & 1 \\ -4 & 2 & 3 \end{pmatrix} =$$

$$3 - \frac{3}{-5} \times (-5) = 0$$

$$2 - \frac{3}{-5} \times 2 = \frac{-4}{5}$$

$$1 - \frac{3}{-5} \times (-1) = \frac{2}{5}$$

$$\begin{pmatrix} -5 & 2 & -1 \\ 0 & \frac{-4}{5} & \frac{2}{5} \\ -4 & 2 & 3 \end{pmatrix} //$$

$$C = \begin{pmatrix} -5 & 2 & -1 \\ 0 & \frac{-4}{5} & \frac{2}{5} \\ -4 & 2 & 3 \end{pmatrix} =$$

$$-4 - \frac{-4}{-5} \times (-5) = 0$$

$$2 - \frac{-4}{-5} \times 2 = \frac{2}{5}$$

$$3 - \frac{-4}{-5} \times (-1) = \frac{19}{5} \ *$$

$$3\frac{4}{5} = \frac{3 \times 5 + 4}{5} = \frac{15+4}{5} = \frac{19}{5}$$

$$\begin{pmatrix} -5 & 2 & -1 \\ 0 & \frac{-4}{5} & \frac{2}{5} \\ 0 & \frac{2}{5} & \frac{19}{5} \end{pmatrix} //$$

$$C = \begin{pmatrix} -5 & 2 & -1 \\ 0 & \frac{-4}{5} & \frac{2}{5} \\ 0 & \frac{2}{5} & \frac{19}{5} \end{pmatrix} =$$

$$0 - \frac{2/5}{-4/5} \times 0 = 0$$

$$\frac{2}{5} - \frac{2/5}{-4/5} \times \frac{-4}{5} = 0$$

$$\frac{19}{5} - \frac{2/5}{-4/5} \times \frac{2}{5} = 4$$

$$\begin{pmatrix} -5 & 2 & -1 \\ 0 & \frac{-4}{5} & \frac{2}{5} \\ 0 & 0 & 4 \end{pmatrix} //$$

$$C = \begin{pmatrix} -5 & 2 & -1 \\ 0 & \frac{-4}{5} & \frac{2}{5} \\ 0 & 0 & 4 \end{pmatrix} = -5 \times \left(\frac{-4}{5}\right) \times 4 = 16 //$$

Eliminación de Gauss R// $|C|$ 16

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