

**King Fahd University of Petroleum and Minerals**  
**Prep-Year Math Program**  
**Math 002 - Term 151**  
**Recitation (9.8)**

**Question 1:** If  $A = \begin{bmatrix} 1 & 1 & 4 \\ 2 & 3 & 6 \\ -1 & -1 & 2 \end{bmatrix}$  such that  $AB = BA = I_3$ , then find the matrix  $B$ .

**Answer:**  $B = A^{-1} = \begin{bmatrix} 2 & -1 & -1 \\ -\frac{5}{3} & 1 & \frac{1}{3} \\ \frac{1}{6} & 0 & \frac{1}{6} \end{bmatrix}$

**Question 2:**

If  $A$  is  $3 \times 3$  matrix such that  $|A| = -2$  and  $A^{-1}$  exists, then find  $|2A^{-1}|$ .

**Answer:**  $|2A^{-1}| = -4$

**Question 3:** Given the matrices  $A = \begin{bmatrix} 1 & 3 \\ -2 & 2 \end{bmatrix}$  and  $BA = \begin{bmatrix} -18 & 12 \\ -16 & 0 \end{bmatrix}$ , then the element in the second row and first column of matrix  $B$  is

**Answer:** The element in the second row and first of  $B$  is  $-4$

**Question 4** Given the matrices  $M^{-1} = \begin{bmatrix} 2 & 7 \\ 1 & 4 \end{bmatrix}$  and  $N^{-1} = \begin{bmatrix} 1 & 2 \\ -2 & -3 \end{bmatrix}$ , then find the sum of elements in 2<sup>nd</sup> row of  $(MN)^{-1}$

**Answer:**  $-33$

**Question 5:** The solution of the system  $\begin{cases} 3x + 5y = -10 \\ -2x - 4y = 6 \end{cases}$  can be given by

A)  $\begin{bmatrix} x \\ y \end{bmatrix} = \begin{bmatrix} 4 & 5 \\ -2 & -3 \end{bmatrix} \begin{bmatrix} -5 \\ 3 \end{bmatrix}$

B)  $\begin{bmatrix} x \\ y \end{bmatrix} = \begin{bmatrix} 4 & 5 \\ -2 & -3 \end{bmatrix} \begin{bmatrix} -10 \\ 6 \end{bmatrix}$

C)  $\begin{bmatrix} x \\ y \end{bmatrix} = \begin{bmatrix} -4 & -5 \\ 2 & 3 \end{bmatrix} \begin{bmatrix} -5 \\ 3 \end{bmatrix}$

D)  $\begin{bmatrix} x \\ y \end{bmatrix} = \begin{bmatrix} 5 & 4 \\ -2 & -3 \end{bmatrix} \begin{bmatrix} -10 \\ 6 \end{bmatrix}$

E)  $\begin{bmatrix} x \\ y \end{bmatrix} = \begin{bmatrix} -2 & -3 \\ 4 & 5 \end{bmatrix} \begin{bmatrix} -5 \\ 3 \end{bmatrix}$