King Fahd University of Petroleum and Minerals

Prep-Year Math Program

Math 002 - Term 132

Recitation (9.8)

Question 1: If A and B are two matrices of order 3×3 and $|A|=4$ and $|B|=5$, then the value of $2|A|-|2B^{-1}|=$

A) -72 B) -2 C) $\frac{32}{5}$ D) 7 E) $\frac{38}{5}$

Answer: $\frac{32}{5}$

Question 2: If $A=\begin{bmatrix}-1 & 2 & -3\\ 6 & -1 & 2\end{bmatrix}$, $B=\begin{bmatrix}0 & -1 & 4\\ -2 & 6 & -3\end{bmatrix}$, then find the matrix X for which

$4X+B=X-2A$.

Answer: $X=\begin{bmatrix}\frac{2}{3} & -1 & \frac{2}{3}\\ -\frac{10}{3} & -\frac{4}{3} & -\frac{1}{3}\end{bmatrix}$

Question 3: If A, B and C are $n\times n$ matrices and I_n is the identity matrix of order n then which of the following statements is TRUE?

A) $(A+I_n)(A-I_n)=A^2-I_n^2$

B) $(A-B)^2=A^2-2AB+B^2$

C) $A^2C=ACA$

D) $(A+I_n)^2=A^2+I_n$

E) $(A+B)(A^2-AB+B^2)=A^3+B^3$

Answer:: A) $(A+I_n)(A-I_n)=A^2-I_n^2$ is **TRUE** because:

$$\begin{aligned}(A+I_n)(A-I_n)&=A^2-AI_n+I_nA-I_n^2\\&=A^2-A+A-I_n^2\\&=A^2-I_n^2\end{aligned}$$

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^{nd} row of $(MN)^{-1}$

Answer: $sum=-7+(-26)=-33$