King Fahd University of Petroleum and Minerals
Prep-Year Math Program
Math 002 - Term 132
Recitation (9.7)

Question 1: If $\begin{bmatrix} x+2 & 8 & -3 \\ 1 & 2y & 2x+1 \\ 7 & -2 & y+2 \end{bmatrix} = \begin{bmatrix} 2x+6 & 8 & -3 \\ 1 & 18 & -7 \\ 7 & -2 & 11 \end{bmatrix}$, then $x+y=$

A) -13 B) -5 C) 5 D) 4 E) 13

Answer: $x+y=-4+9=5$

Question 2: If $A=\begin{bmatrix} 1 & -2 & 2 \\ 3 & 1 & -1 \\ 1 & 1 & 4 \end{bmatrix}$, then find the element in the third row and second column of the matrix $A^2+3A-2I_3$

Answer: $c_{32}=6$

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) $(A+I_n)(A-I_n)=A^2-I_n^2$ (**True**) **because** $(A+I_n)(A-I_n)=A^2-A+A-I_n^2=A^2-I_n^2$

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

C) $A^2C=ACA$ (False)

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

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

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