CE311K – McKinney
Homework 7

Arrays

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Matrices

Problem 6. When addition is defined, add the matrices A and B in the following cases:

a. $\boldsymbol{A} = \begin{bmatrix} 3 & 4 & 5 \\ 2 & 1 & 6 \end{bmatrix}$ $\boldsymbol{B} = \begin{bmatrix} 9 & 7 & 2 \\ 0 & 1 & 8 \end{bmatrix}$

b. $\boldsymbol{A} = \begin{bmatrix} 3 & 2 \end{bmatrix}$ $\boldsymbol{B} = \begin{bmatrix} 4 \\ 6 \end{bmatrix}$

c. $\boldsymbol{A} = \begin{bmatrix} 4 \\ 5 \\ 6 \end{bmatrix}$ $\boldsymbol{B} = \begin{bmatrix} 7 \\ 8 \\ 9 \end{bmatrix}$

d. $\boldsymbol{A} = \begin{bmatrix} 0 & 1 \\ 0 & 6 \end{bmatrix}$ $\boldsymbol{B} = \begin{bmatrix} 7 & 4 \\ 1 & 0 \end{bmatrix}$

Problem 7. Find the product $\boldsymbol{AB}$:

a. $\boldsymbol{A} = \begin{bmatrix} 1 & 2 & 4 & 5 \\ 3 & 1 & 0 & 2 \end{bmatrix}$ $\boldsymbol{B} = \begin{bmatrix} 1 \\ 4 \\ 8 \\ 9 \end{bmatrix}$

b. $\boldsymbol{A} = \begin{bmatrix} 1 \\ 0 \\ 7 \\ 8 \end{bmatrix}$ $\boldsymbol{B} = \begin{bmatrix} 2 & 4 & 9 & 6 & 5 & 0 \end{bmatrix}$

c. $\boldsymbol{A} = \begin{bmatrix} 3 & 1 \\ 2 & 4 \\ 5 & 6 \end{bmatrix}$ $\boldsymbol{B} = \begin{bmatrix} 1 \\ 2 \end{bmatrix}$

Problem 8. Given the diagonal matrices ***A*** and ***B***, compute ***AB***. Is ***AB*** = ***BA***?

$$\boldsymbol{A} = \begin{bmatrix} a_{11} & 0 & 0 & 0 & 0 \\ 0 & a_{22} & 0 & 0 & 0 \\ 0 & 0 & a_{33} & 0 & 0 \\ 0 & 0 & 0 & \ddots & 0 \\ 0 & 0 & 0 & 0 & a_{nn} \end{bmatrix} \quad \boldsymbol{B} = \begin{bmatrix} b_{11} & 0 & 0 & 0 & 0 \\ 0 & b_{22} & 0 & 0 & 0 \\ 0 & 0 & b_{33} & 0 & 0 \\ 0 & 0 & 0 & \ddots & 0 \\ 0 & 0 & 0 & 0 & b_{nn} \end{bmatrix}$$

Problem 9. Given the matrices

$$X = \begin{bmatrix} 1 & 6 \\ 3 & 10 \\ 7 & 4 \end{bmatrix} \quad Y = \begin{bmatrix} 6 & 0 \\ 1 & 4 \end{bmatrix} \quad Z = \begin{bmatrix} 1 & 1 \\ 6 & 8 \end{bmatrix}$$

Show that ***Y********Z*** is not equal to ***Z********Y***

Problem 10. If $A = \begin{bmatrix} 4 & 3 \\ 2 & 1 \end{bmatrix}$ and $B = \begin{bmatrix} 2 & 1 \\ 3 & 4 \end{bmatrix}$, then $C = \begin{bmatrix} 17 & 16 \\ 7 & 6 \end{bmatrix}$ denotes the

a) _____ sum of A and B;

b) _____ difference of A and B;

c) _X___ product of A and B;

d) ____ none of the above