Advanced Algebra

Unit 6 Linear Programming- Matrices Multiplication

Assignment #8

Find each matrix product, if it is defined

1) $\begin{bmatrix} 4 & 3 \\ -1 & -2 \end{bmatrix} * \begin{bmatrix} 5 \\ 1 \end{bmatrix}$

2) $\begin{bmatrix} -6 \\ 2 \end{bmatrix} * \begin{bmatrix} -1 & 12 \\ 0 & -4 \end{bmatrix}$

3) $\begin{bmatrix} 1 & -5 \\ 2 & 3 \end{bmatrix} * \begin{bmatrix} 4 & -4 \\ 0 & 1 \end{bmatrix}$

4) $\begin{bmatrix} -2 & 3 \\ 4 & 2 \end{bmatrix} * \begin{bmatrix} 0 & 3 \\ -6 & 5 \end{bmatrix}$

5) $\begin{bmatrix} 8 & -10 \\ 0 & 3 \\ -6 & 4 \end{bmatrix} * \begin{bmatrix} -2 \\ -9 \\ 1 \end{bmatrix}$

6) $\begin{bmatrix} 7 & 1 & -3 & 4 \end{bmatrix} * \begin{bmatrix} 4 & 1 \\ -3 & 8 \\ 9 & 5 \\ -2 & 6 \end{bmatrix}$

7) $\begin{bmatrix} 9 & -4 & 4 \\ 2 & -1 & -6 \end{bmatrix} * \begin{bmatrix} 2 & -1 & 0 \\ 0 & 1 & -3 \\ 3 & 5 & 2 \end{bmatrix}$

8) $\begin{bmatrix} 0 \\ -2 \end{bmatrix} * \begin{bmatrix} 4 \\ 1 \end{bmatrix}$

9) $\begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{bmatrix} * \begin{bmatrix} a & b & c \\ d & e & f \\ g & h & i \end{bmatrix}$

10) $\begin{bmatrix} 9 & 4 \\ 3 & 1 \\ 2 & 8 \\ 1 & 5 \end{bmatrix} * \begin{bmatrix} 4 & 2 & 1 \\ 3 & 0 & 2 \end{bmatrix}$

Applications of Matrices

Business: Matrix S gives the number of three types of cars sold in March by two car dealers, and matrix P gives the profit for each type of car sold.

dealer

$$\begin{array}{cc} & \begin{matrix} 1 & \quad 2 \end{matrix} \\ \begin{matrix} Compact \\ Mid-Size \\ full\ Size \end{matrix} & \begin{bmatrix} 18 & 15 \\ 24 & 17 \\ 16 & 20 \end{bmatrix} \end{array} = S$$

$$\begin{array}{c} \begin{matrix} compact & mid & full \end{matrix} \\ Profit\ [\ \$400 \quad \$650 \quad \$900\ ] = P \end{array}$$

Which matrix is defined, SP or PS? **Find this matrix and interpret its elements.**

Education:

Suppose a teacher calculates your test average for the term by using a formula that counts or weights each of your five tests a certain percentage of your grade, as shown in Matrix W below.

Test#   1   2   3   3   5

Weight [15%   15% 25% 15% 30%]

$$Scores: \begin{array}{c} \begin{matrix} Test\ 1 \\ Test\ 2 \\ Test\ 3 \\ Test4 \\ Test5 \end{matrix} \begin{bmatrix} 82 & 92 & 74 \\ 85 & 88 & 68 \\ 78 & 95 & 73 \\ 75 & 85 & 82 \\ 84 & 94 & 81 \end{bmatrix} \end{array}$$ These are the test scores for students A, B, C

Arrange the matrices so that you can give each student a final score for the semester.