LESSON 4-2

Multiplying Matrices

Know it! Note

Lesson Objectives (p. 253):

Vocabulary

1. Matrix product (p. 253): _____

2. Square matrix (p. 255): _____

3. Main diagonal (p. 255): _____

4. Multiplicative identity matrix (p. 255): _____

Key Concepts

5. Multiplying Matrices—Rules (p. 253):

- Matrices A and B can be multiplied only _____.
- The product of an $m \times n$ and an $n \times p$ matrix is _____.

6. Multiplying Matrices (p. 254):

WORDS	NUMBERS	ALGEBRA

LESSON 4-2

Multiplying Matrices

Know it! Note

Lesson Objectives (p. 253):

understand the properties of matrices with respect to multiplication; multiply two matrices.

Vocabulary

1. Matrix product (p. 253): the product of two or more matrices.

2. Square matrix (p. 255): any matrix that has the same number of rows as columns.

3. Main diagonal (p. 255): the diagonal from the upper left corner to the lower right corner of a square matrix.

4. Multiplicative identity matrix (p. 255): any square matrix named with the letter *I*, that has all of the entries along the main diagonal equal to 1 and all of the other entries equal to 0.

Key Concepts

5. Multiplying Matrices—Rules (p. 253):

- Matrices A and B can be multiplied only **if the number of columns in A equals the number of rows in B**.
- The product of an $m \times n$ and an $n \times p$ matrix is **an $m \times p$ matrix**.

6. Multiplying Matrices (p. 254):

WORDS	NUMBERS	ALGEBRA
In a matrix product $P = AB$, each element p_{ij} is the sum of the products of consecutive entries in row i in matrix A and column j in matrix B.	$P = \begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix}\begin{bmatrix} 5 & 6 \\ 7 & 8 \end{bmatrix} =$ $\begin{bmatrix} 1\cdot5 + 2\cdot7 & 1\cdot6 + 2\cdot8 \\ 3\cdot5 + 4\cdot7 & 3\cdot6 + 4\cdot8 \end{bmatrix}$	$P = \begin{bmatrix} a_1 & a_2 \\ b_1 & b_2 \end{bmatrix}\begin{bmatrix} c_1 & c_2 \\ d_1 & d_2 \end{bmatrix} =$ $\begin{bmatrix} a_1c_1 + a_2d_1 & a_1c_2 + a_2d_2 \\ b_1c_1 + b_2d_1 & b_1c_2 + b_2d_2 \end{bmatrix}$

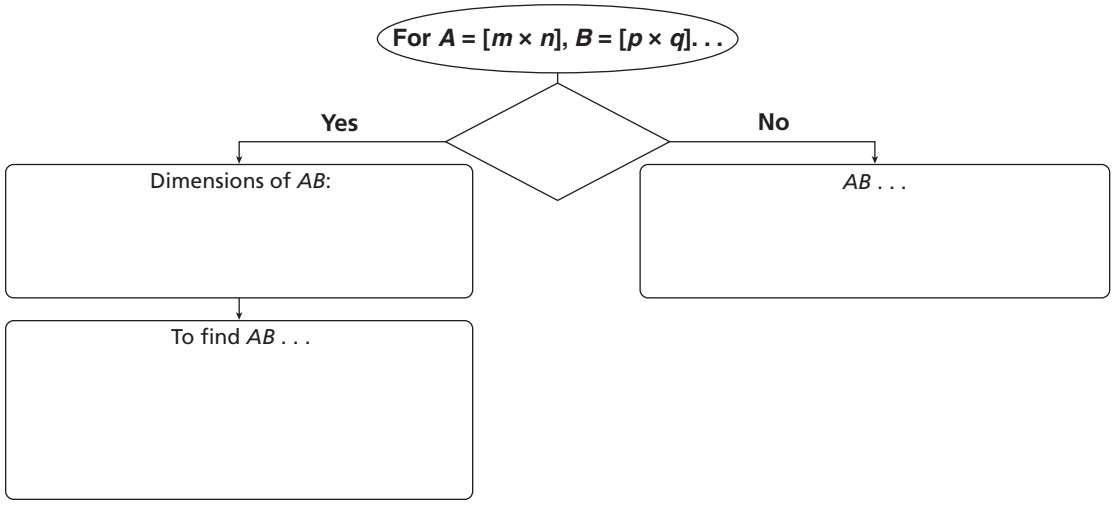
7. Multiplicative Identity Matrix (p. 255):

The multiplicative identity matrix is any square matrix, named with the letter *I,* that has

_____

_____

8. Get Organized In the decision diamond, enter a question to determine whether *AB* is defined. Then give the general procedure for finding *AB*, if it is defined. (p. 256).



7. Multiplicative Identity Matrix (p. 255):

The multiplicative identity matrix is any square matrix, named with the letter *I,* that has

all of the entries along the main diagonal equal to 1 and all of the other entries equal to 0.

8. Get Organized In the decision diamond, enter a question to determine whether *AB* is defined. Then give the general procedure for finding *AB*, if it is defined. (p. 256).