

Multiplying Matrices

$$A \cdot B = AB$$

1. State whether AB is defined. If so, give the dimensions.

a. $A: 2 \times 4$ $B: 4 \times 3$

b. $A: 1 \times 4$ $B: 1 \times 4$

2. Find AB if $A = \begin{bmatrix} -1 & 5 \\ 5 & 2 \\ 0 & -4 \end{bmatrix}$ and $B = \begin{bmatrix} 4 & -3 \\ 6 & 8 \end{bmatrix}$.

Properties of Matrix Operations

Associative Property of Addition
Commutative Property of Addition
Distributive Property (with a scalar)

$$(A + B) + C = A + (B + C)$$
$$A + B = B + A$$
$$c(A \pm B) = cA \pm cB$$

Properties of Matrix Multiplication

Associative Property of Matrix Multiplication
Left Distributive Property
Right Distributive Property
Associative Property of Scalar Multiplication

$$A(BC) = (AB)C$$
$$A(B + C) = AB + AC$$
$$(A + B)C = AC + BC$$
$$c(AB) = (cA)B = A(cB)$$

4. $A = \begin{bmatrix} 2 & -2 \\ 1 & 4 \end{bmatrix}$, $B = \begin{bmatrix} 0 & 1 \\ -3 & -2 \end{bmatrix}$ and $C = \begin{bmatrix} 0 & 3 \\ 2 & -1 \end{bmatrix}$. Find $B(A + C)$