

MGF / Multiplication of matrices: Basic

Worked Examples:

To be able to multiply columns of the first must match rows of the 2nd.

Multiplication of matrices: Basic

Let $A = \begin{bmatrix} 2 & 0 \\ 4 & 4 \\ 6 & -1 \end{bmatrix}$ and $B = \begin{bmatrix} -1 & -3 \\ 2 & 2 \end{bmatrix}$.

Find AB if it is defined. Otherwise, click on "Undefined".

AB ✓

$3 \times 2 \quad 2 \times 2$

Since equal we can multiply

Answer will be a 3×2

take each row of the 1st times each column of 2nd

$$\begin{bmatrix} 2 & 0 \\ 4 & 4 \\ 6 & -1 \end{bmatrix} \begin{bmatrix} -1 & -3 \\ 2 & 2 \end{bmatrix} = \begin{bmatrix} -2 & -6 \\ 4 & -4 \\ -8 & -20 \end{bmatrix}$$

$a_{11} = 1^{st} \text{ row, } 1^{st} \text{ column} = 2(-1) + 0(2) = -2$
 $a_{12} = 1^{st} \text{ row, } 2^{nd} \text{ column} = 2(-3) + 0(2) = -6$
 $a_{21} = 2^{nd} \text{ row, } 1^{st} \text{ column} = 4(-1) + 4(2) = 4$
 $a_{22} = 2^{nd} \text{ row, } 2^{nd} \text{ column} = 4(-3) + 4(2) = -4$
 $a_{31} = 3^{rd} \text{ row, } 1^{st} \text{ column} = 6(-1) + (-1)(2) = -8$
 $a_{32} = 3^{rd} \text{ row, } 2^{nd} \text{ column} = 6(-3) + (-1)(2) = -20$

Multiplication of matrices: Basic

Let $A = \begin{bmatrix} 4 & -7 \\ -2 & 6 \\ 2 & 7 \end{bmatrix}$ and $B = \begin{bmatrix} 0 & 2 \\ -3 & 5 \end{bmatrix}$.

Find AB if it is defined. Otherwise, click on "Undefined".

$A \quad B$

$3 \times 2 \quad 2 \times 2$

✓

3x2

$$\begin{bmatrix} 4 & -7 \\ -2 & 6 \\ 2 & 7 \end{bmatrix} \cdot \begin{bmatrix} 0 & 2 \\ -3 & 5 \end{bmatrix} = \begin{bmatrix} 21 & -27 \\ -18 & 26 \\ -21 & 39 \end{bmatrix}$$

$a_{11} = 4(0) + (-7)(-3) = 21$
 $a_{12} = 4(2) + (-7)(5) = -27$
 $a_{21} = -2(0) + 6(-3) = -18$
 $a_{22} = -2(2) + 6(5) = 26$
 $a_{31} = 2(0) + 7(-3) = -21$
 $a_{32} = 2(2) + 7(5) = 39$

$$a_{31} \quad 2(0) + 7(-3) = -21$$

$$a_{32} \quad 2(2) + 7(5) = 39$$

Multiplication of matrices: Basic

Let $A = \begin{bmatrix} 1 & 5 \\ 1 & -4 \end{bmatrix}$ and $B = \begin{bmatrix} 0 & 4 \\ 3 & 3 \\ -2 & -7 \end{bmatrix}$.

Find BA if it is defined. Otherwise, click on "Undefined".

A B
 2×2 3×2
 doesn't work
 $AB = \text{undefined}$

B A
 3×2 2×2
 can do
 Answer 3×2

#GraphsFunctionsAndSystems

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