

**Matrix Multiplication**

This supplemental handout is intended to help students learn matrix multiplication (as a computation)

First, watch this video by the <https://www.youtube.com/watch?v=kT4Mp9EdVqs>, Introduction to Matrix Multiplication, by the Khan Academy.

**Practice Problems** Multiply the matrices.

$$1. \begin{bmatrix} 1 & -2 \\ 3 & 4 \end{bmatrix} \begin{bmatrix} 2 & 5 \\ 6 & 3 \end{bmatrix} =$$

$$2. \begin{bmatrix} 0 & 1 \\ -1 & 0 \end{bmatrix} \begin{bmatrix} 0 & 2 \\ 2 & 3 \end{bmatrix} =$$

$$3. \begin{bmatrix} 2 & 2 & 3 \\ 1 & 0 & 2 \end{bmatrix} \begin{bmatrix} 1 & -1 & 2 \\ 2 & 2 & 3 \\ 3 & 5 & 2 \end{bmatrix} =$$

$$4. \begin{bmatrix} a & b \\ c & d \end{bmatrix} \begin{bmatrix} x \\ y \end{bmatrix} =$$

## Answers

1.  $\begin{bmatrix} -10 & -1 \\ 30 & 27 \end{bmatrix}$

2.  $\begin{bmatrix} 2 & 3 \\ 0 & -2 \end{bmatrix}$

3.  $\begin{bmatrix} 15 & 17 & 16 \\ 7 & 9 & 6 \end{bmatrix}$

4.  $\begin{bmatrix} ax + by \\ cx + dy \end{bmatrix}$

Additional videos that are useful for deeper understanding.

- How to organize, add and multiply matrices, Bill Shillito.  
<https://www.youtube.com/watch?v=kqWCwwyeE6k>
- Matrix multiplication as composition by 3 Blue 1 Brown. <https://youtu.be/XkY2DOUCWMU>