

Linear Algebra

[KOMS119602] - 2022/2023

12.4 - Intuition

Dewi Sintiar

Computer Science Study Program
Universitas Pendidikan Ganesha

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Learning objectives

- To have an intuition of the concept of linear transformation.

Vectors transformation (1)

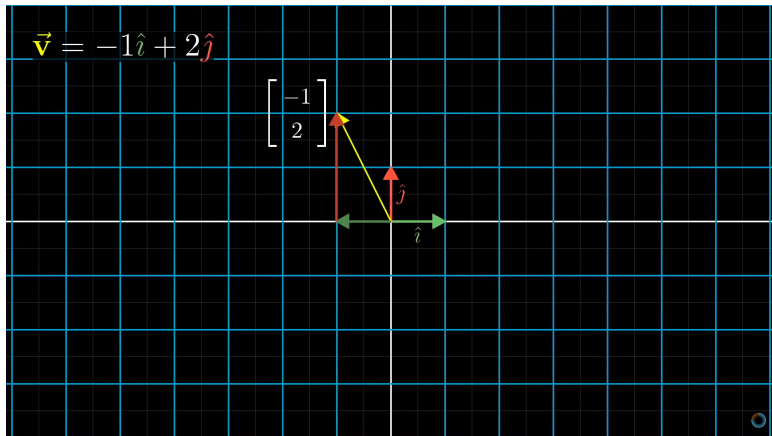


Figure: Source: Youtube of 3Blue1Brown

Vectors transformation (2)

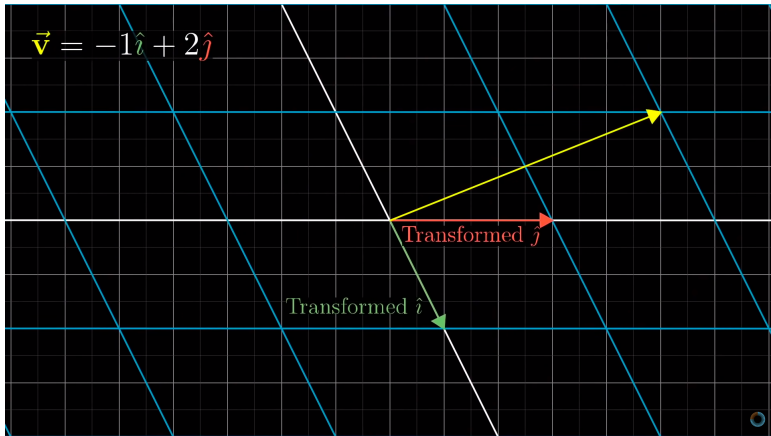


Figure: Source: Youtube of 3Blue1Brown

Vectors transformation (3)

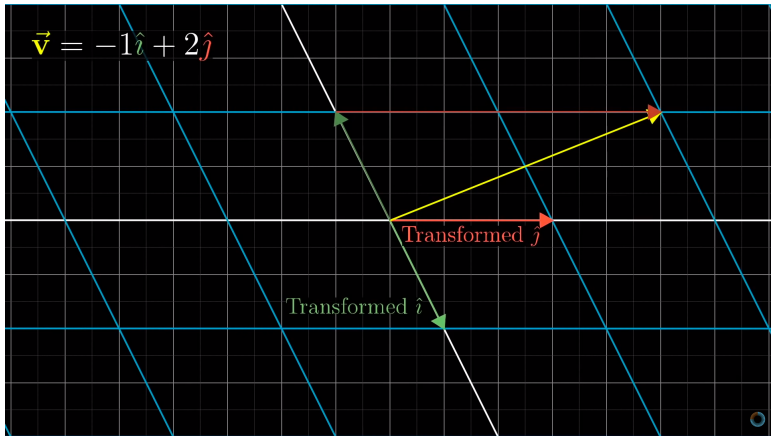


Figure: Source: Youtube of 3Blue1Brown

Vectors transformation (4)

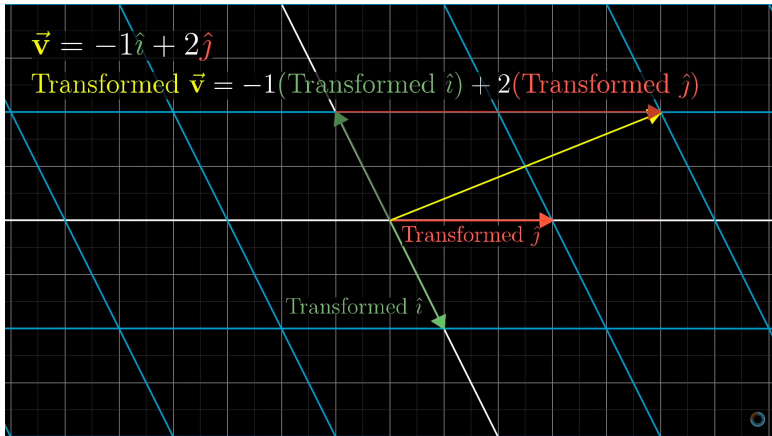


Figure: Source: Youtube of 3Blue1Brown

Vectors transformation (5)

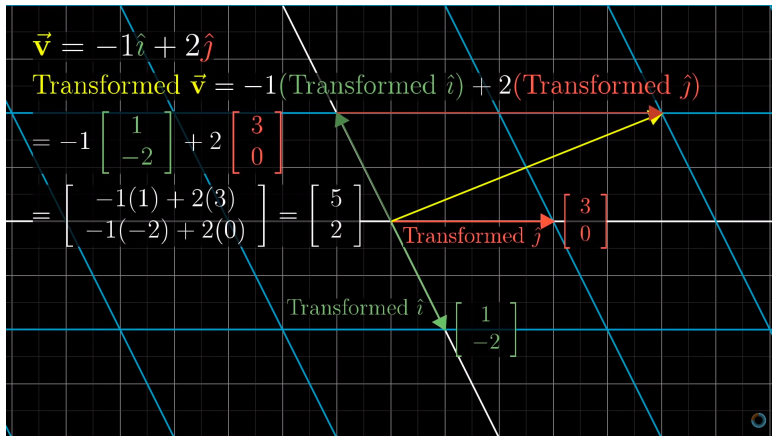


Figure: Source: Youtube of 3Blue1Brown

Rule of transformation (1)

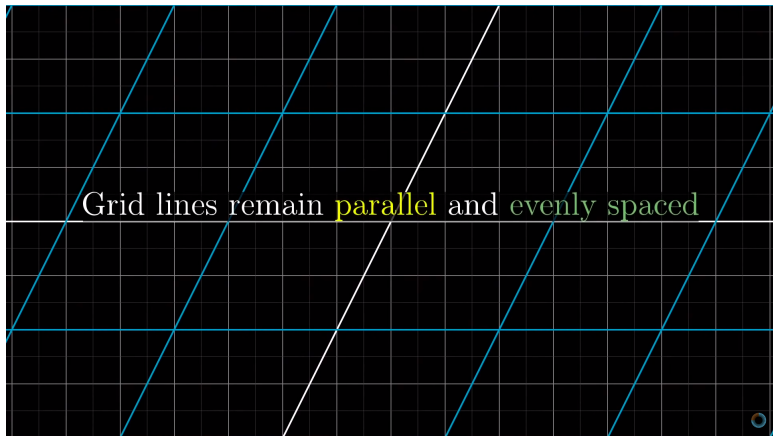


Figure: Source: Youtube of 3Blue1Brown

Rule of transformation (2)

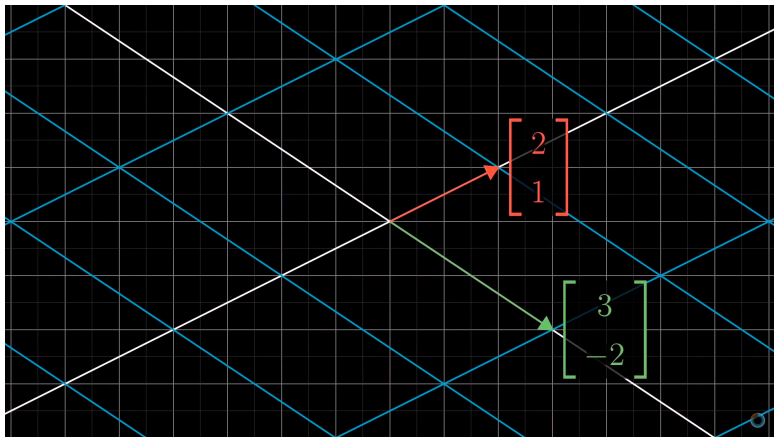


Figure: Source: Youtube of 3Blue1Brown

Rule of transformation (3)

“2x2 Matrix”

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

Where \hat{i} lands Where \hat{j} lands

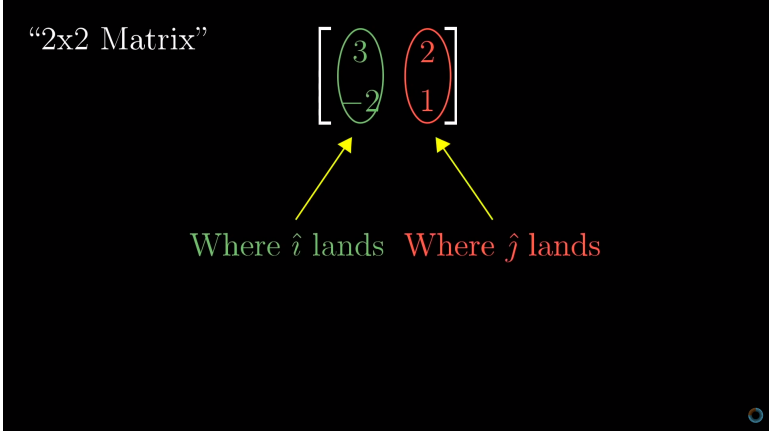


Figure: Source: Youtube of 3Blue1Brown

Rule of transformation (4)

“2x2 Matrix”

$$\begin{bmatrix} a & b \\ c & d \end{bmatrix} \begin{bmatrix} x \\ y \end{bmatrix} = x \begin{bmatrix} a \\ c \end{bmatrix} + y \begin{bmatrix} b \\ d \end{bmatrix} = \begin{bmatrix} ax + by \\ cx + dy \end{bmatrix}$$

Where all the intuition is

Figure: Source: Youtube of 3Blue1Brown

Example of transformation (1)

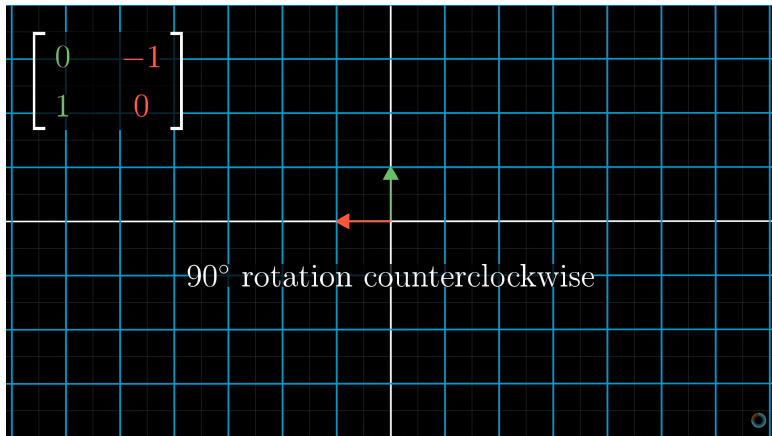


Figure: Source: Youtube of 3Blue1Brown

Example of transformation (2)

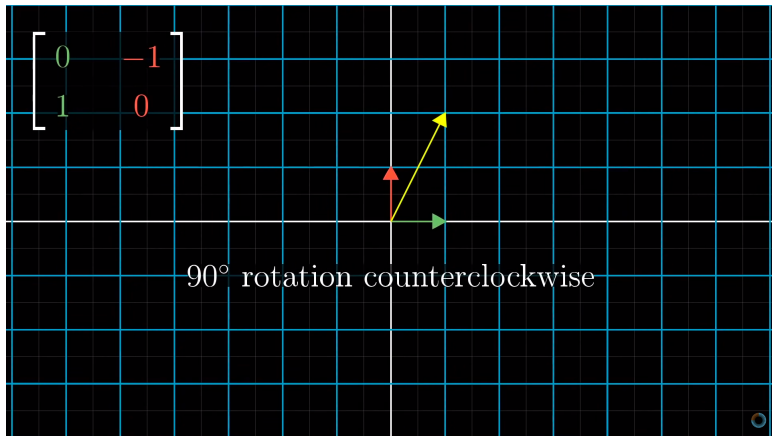


Figure: Source: Youtube of 3Blue1Brown

Example of transformation (3)

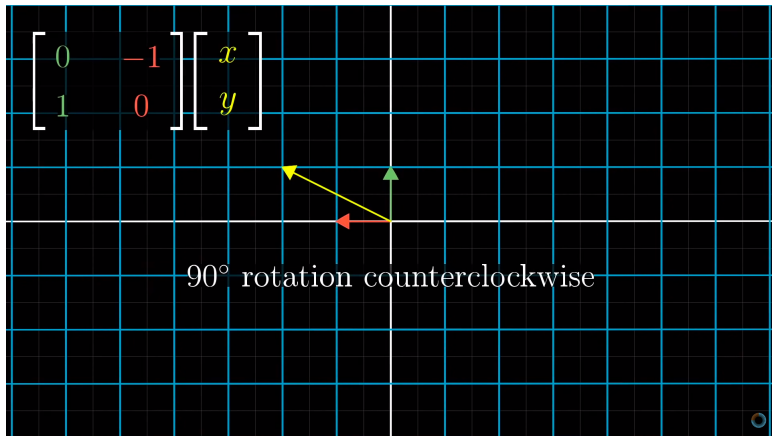


Figure: Source: Youtube of 3Blue1Brown

Example of transformation (4)

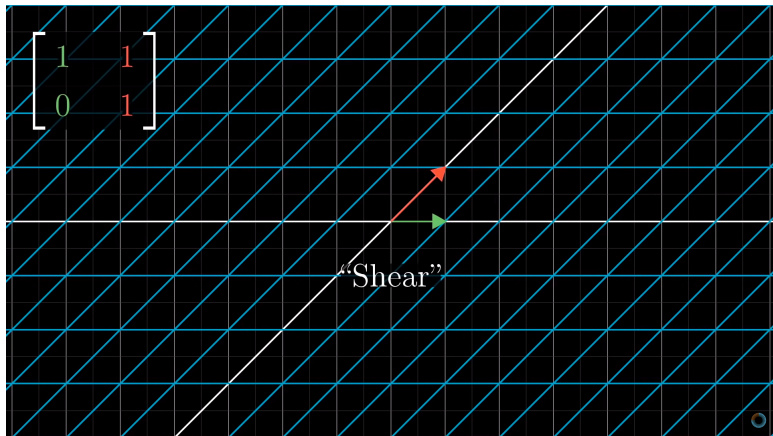


Figure: Source: Youtube of 3Blue1Brown

Example of transformation (5)

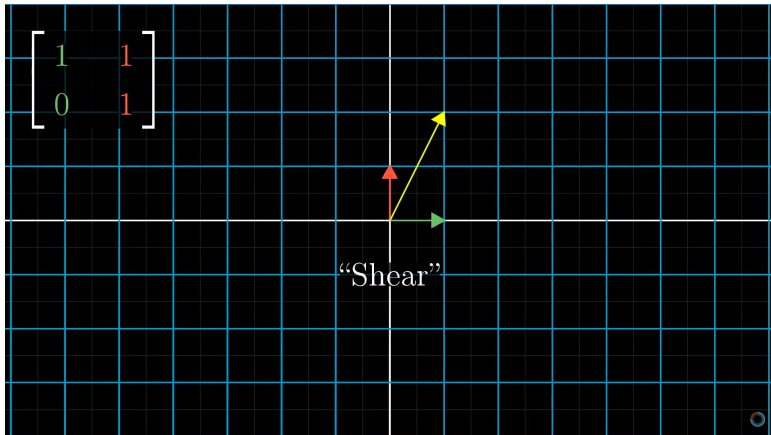


Figure: Source: Youtube of 3Blue1Brown

Example of transformation (6)

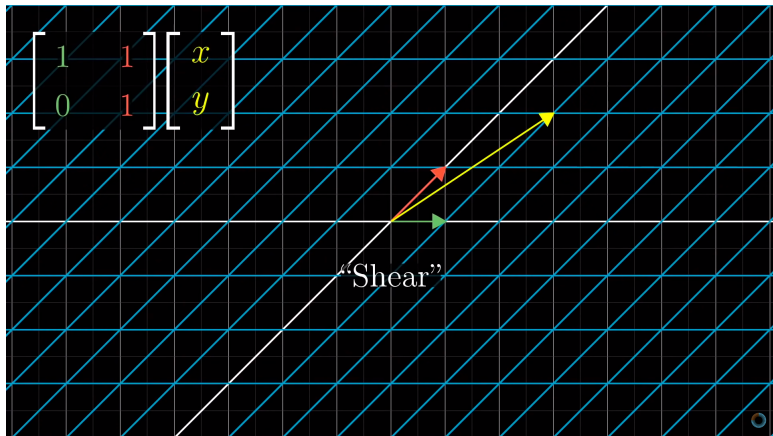


Figure: Source: Youtube of 3Blue1Brown