



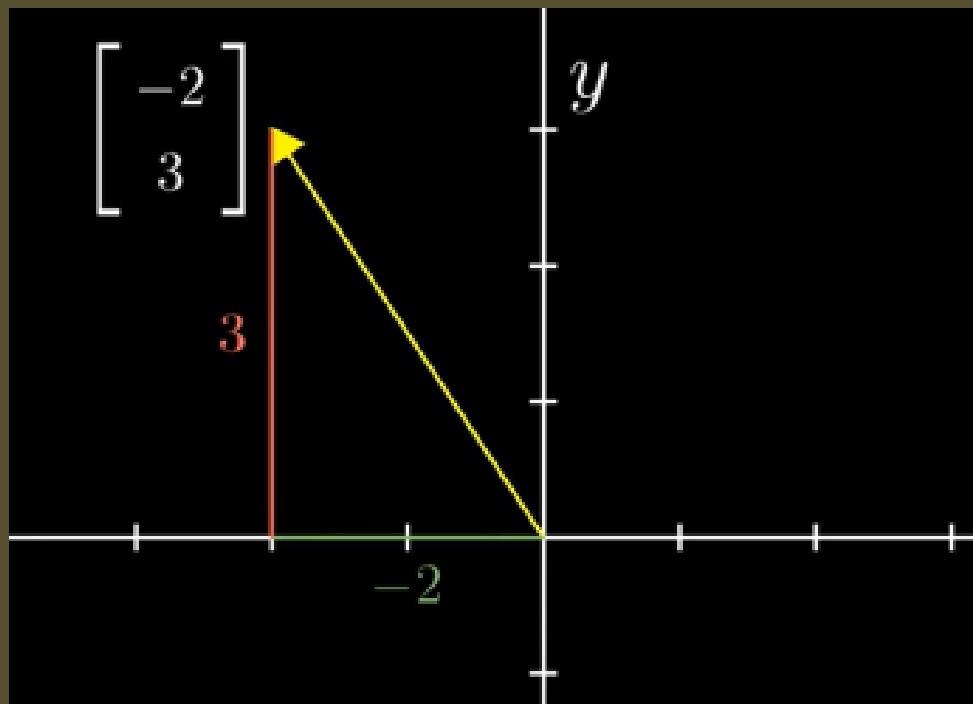
Calentado: Algebra Lineal

Andrés Daniel Godoy Ortiz

Visión Computacional

Geométricamente cómo se lee este vector

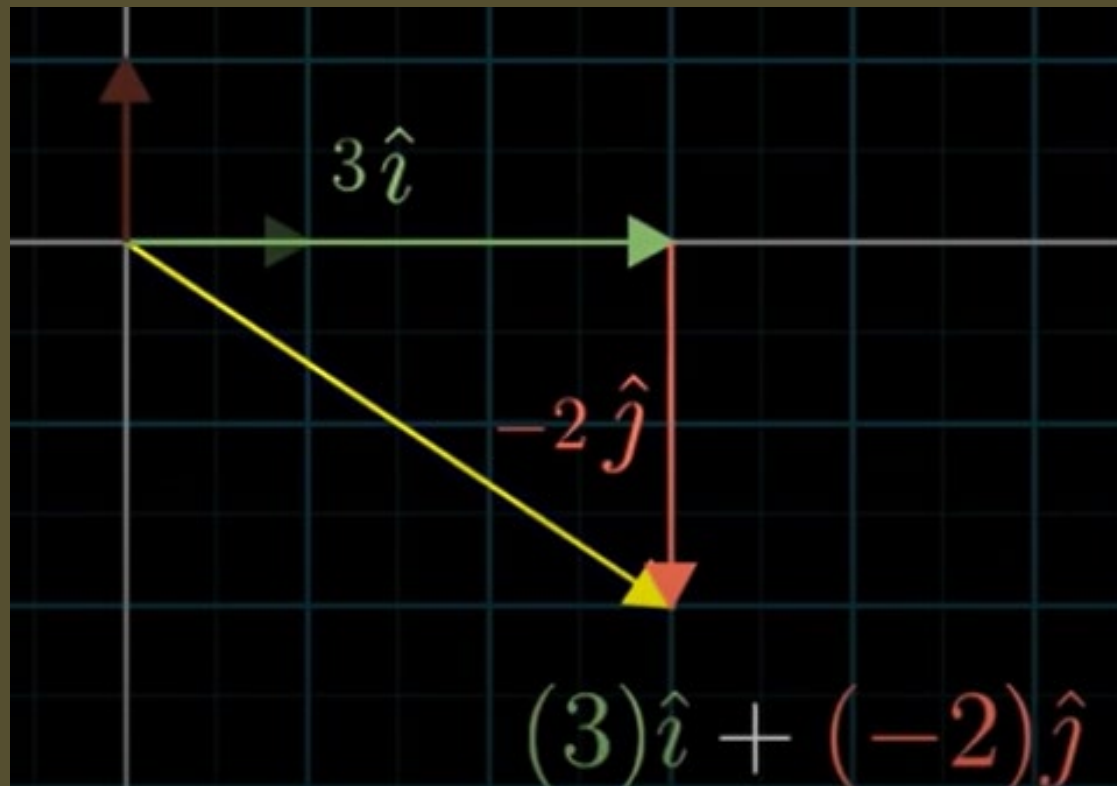
$$\begin{bmatrix} -2 \\ 3 \end{bmatrix}$$



The top of the slide features a decorative header with a dark olive green background. It contains several overlapping semi-circular shapes in a slightly lighter shade of green. Some of these shapes are filled with concentric curved lines, while others are filled with a pattern of small, elongated, teardrop-like shapes.

¿Cómo funciona la suma de vectores?

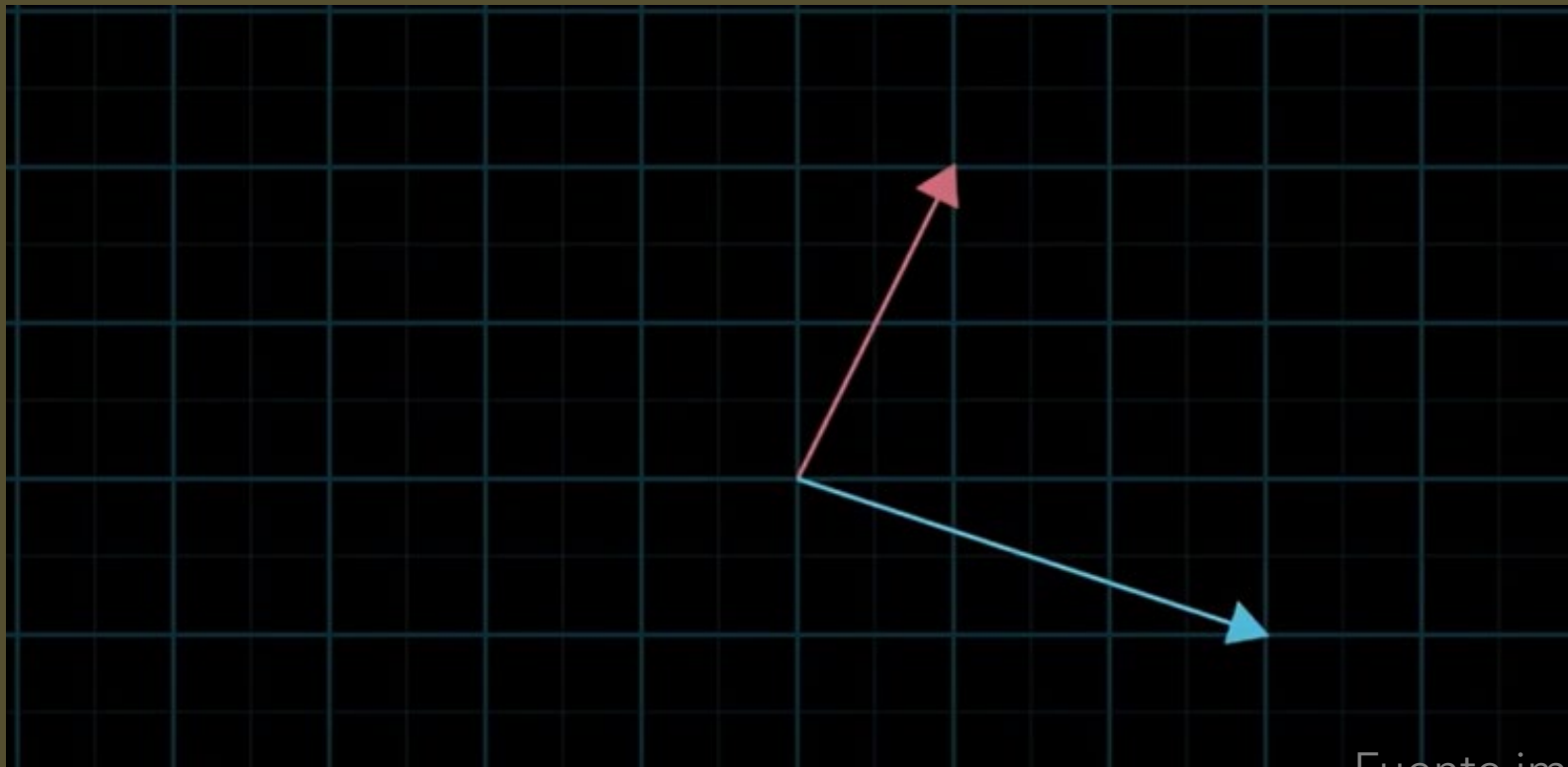
Así las cosas, ¿cómo se puede describir un vector cualquiera?



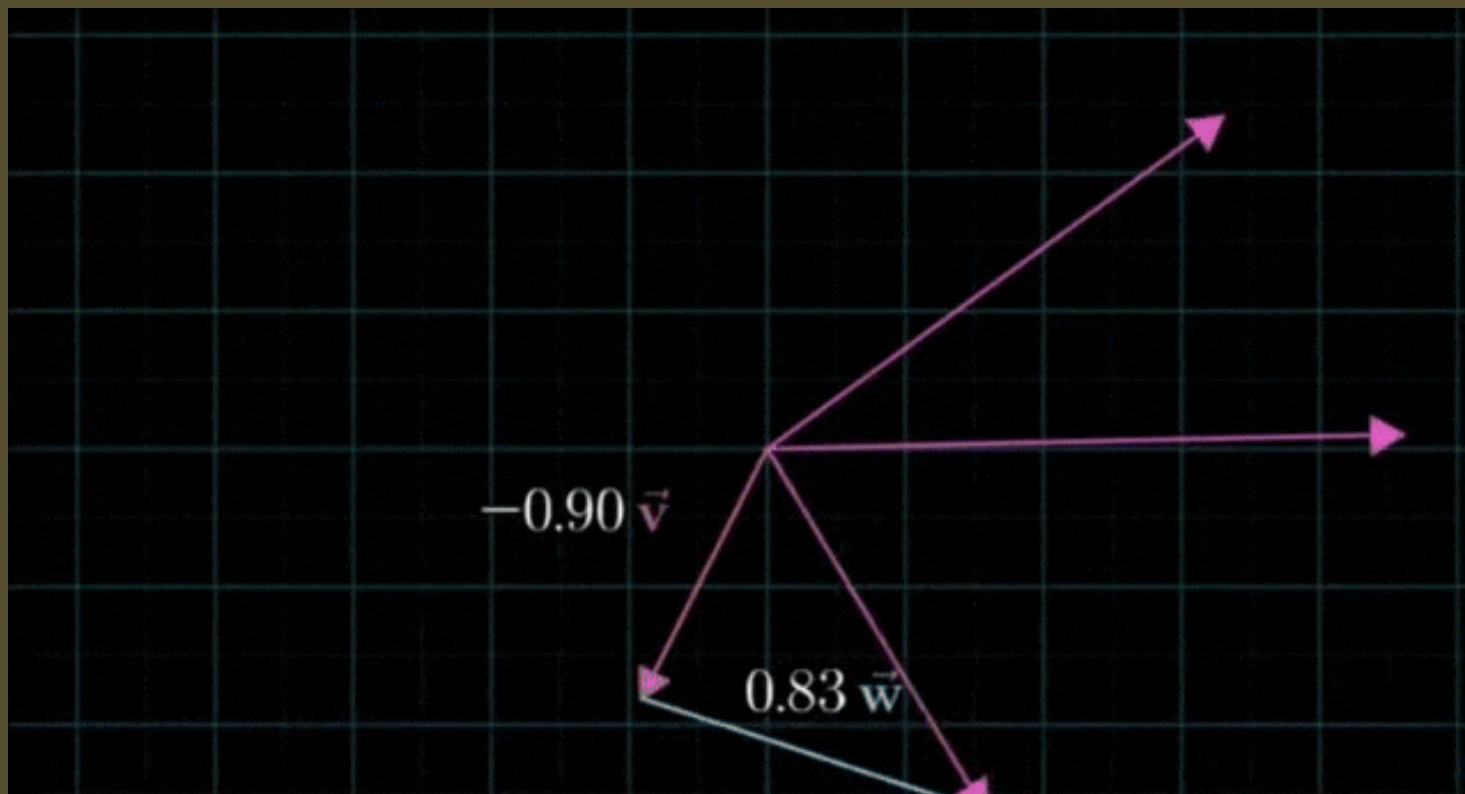
The top of the slide features a decorative header with a dark olive green background. It contains several overlapping semi-circular shapes. Some are solid dark brown, while others are filled with concentric arcs or radial dashed lines in a slightly lighter shade of brown.

¿Qué es una combinación lineal?

Si tomara dos vectores cualesquiera y de diferente dirección ¿qué vectores son alcanzables a través de una combinación lineal de ellos?



Fuente imagen: 3blue1brown

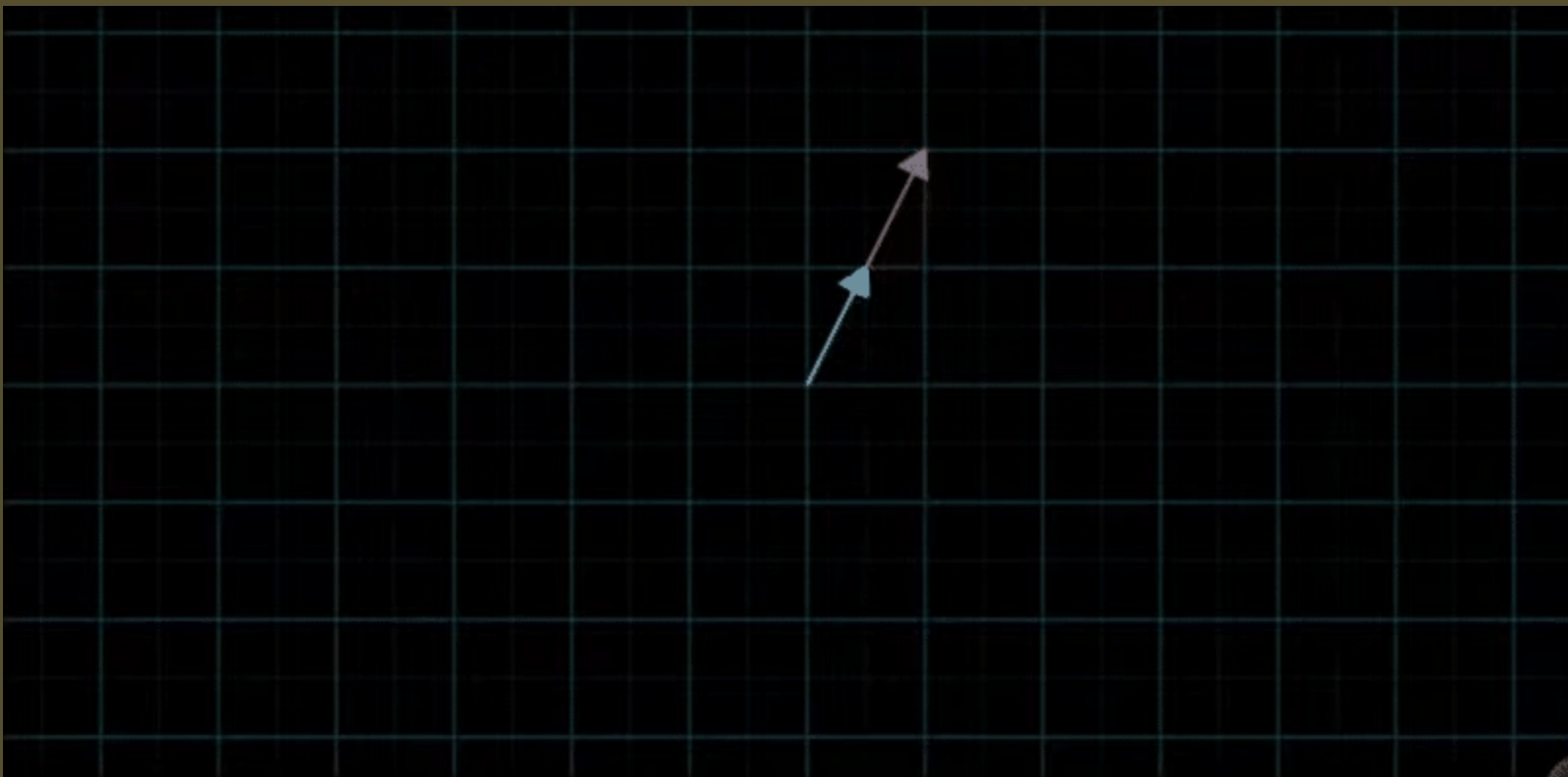


The header features a dark olive green background with a series of repeating geometric patterns. These patterns consist of concentric semi-circles and dashed lines, creating a textured, architectural feel.

Qué pasa si tengo dos vectores, pero

$$\mathbf{y} = c\mathbf{x}$$

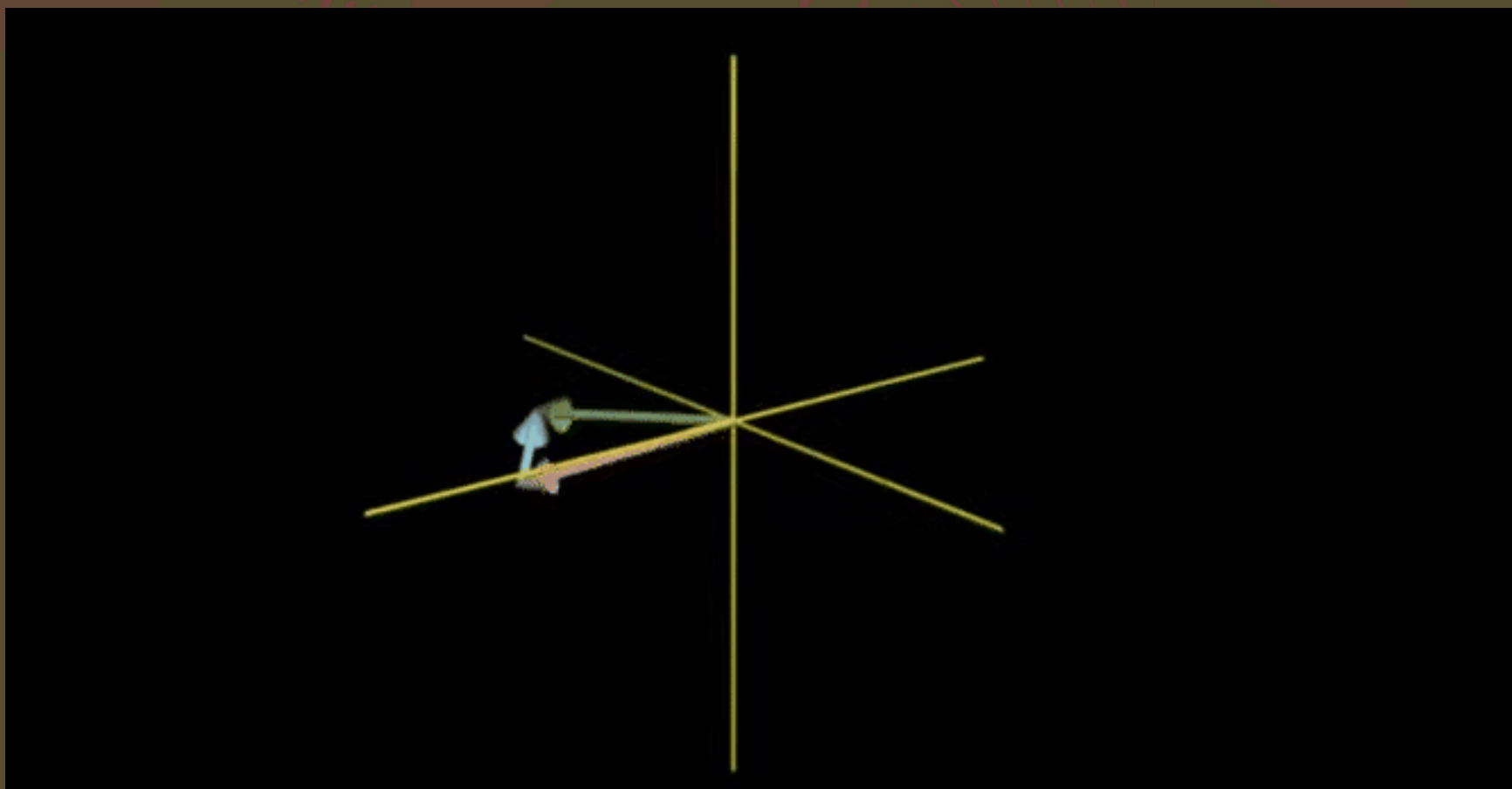
¿Qué vectores son alcanzables?



Fuente imagen: 3blue1brown

¿qué vectores son alcanzables por estos dos vectores?

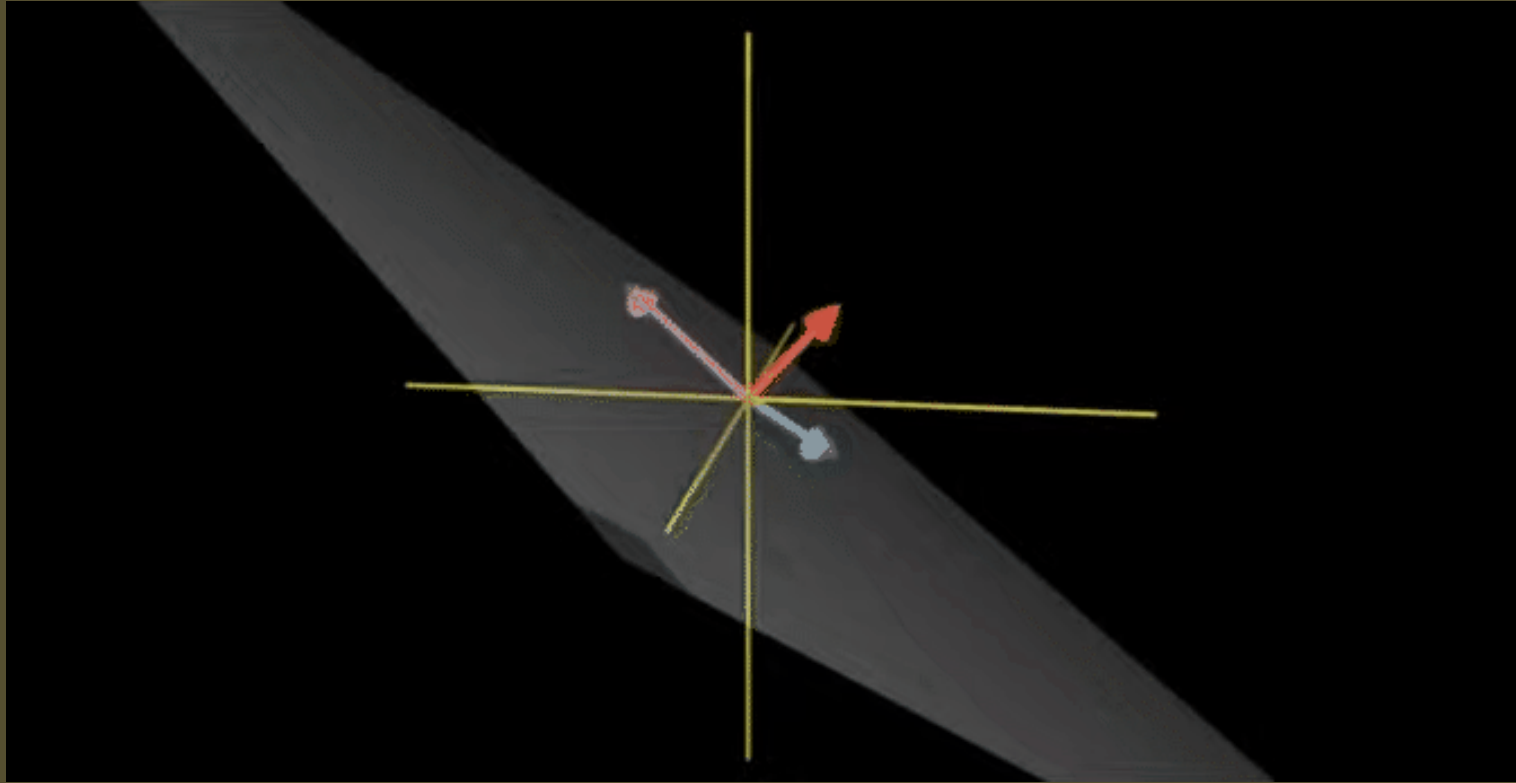
$$\begin{bmatrix} 1 & -1 \\ 0 & 1 \\ 2 & 3 \end{bmatrix}$$



Fuente imagen: 3blue1brown

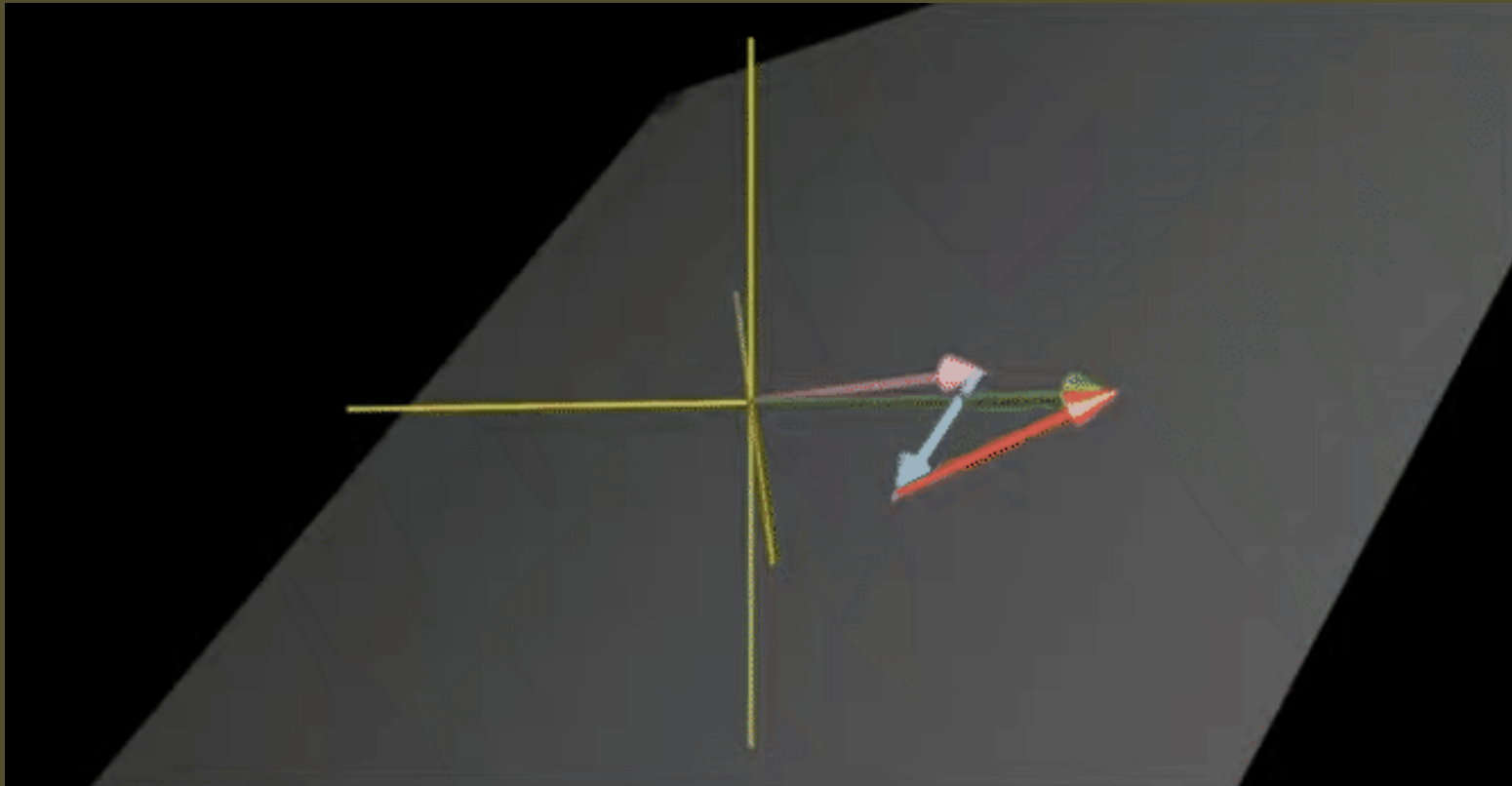
The top of the image features a decorative header with a dark olive green background. It contains several overlapping semi-circular shapes in a slightly lighter shade of green. Some of these shapes are filled with concentric dashed lines, while others are solid.

Si agrego un tercer vector, ¿qué tiene que pasar para que ocupe todo el espacio 3D?



Fuente imagen: 3blue1brown


¿Qué pasó aquí?



Fuente imagen: 3blue1brown

The header features a dark olive green background with a series of semi-circular patterns in a slightly lighter shade of green. These patterns are composed of concentric arcs and dashed lines, creating a textured, organic feel.

¿Cuándo un vector es linealmente independiente?

The top of the slide features a decorative header with a dark olive green background. It contains several overlapping semi-circular shapes in a slightly lighter shade of green. Some of these shapes are filled with concentric dashed lines, while others are solid.

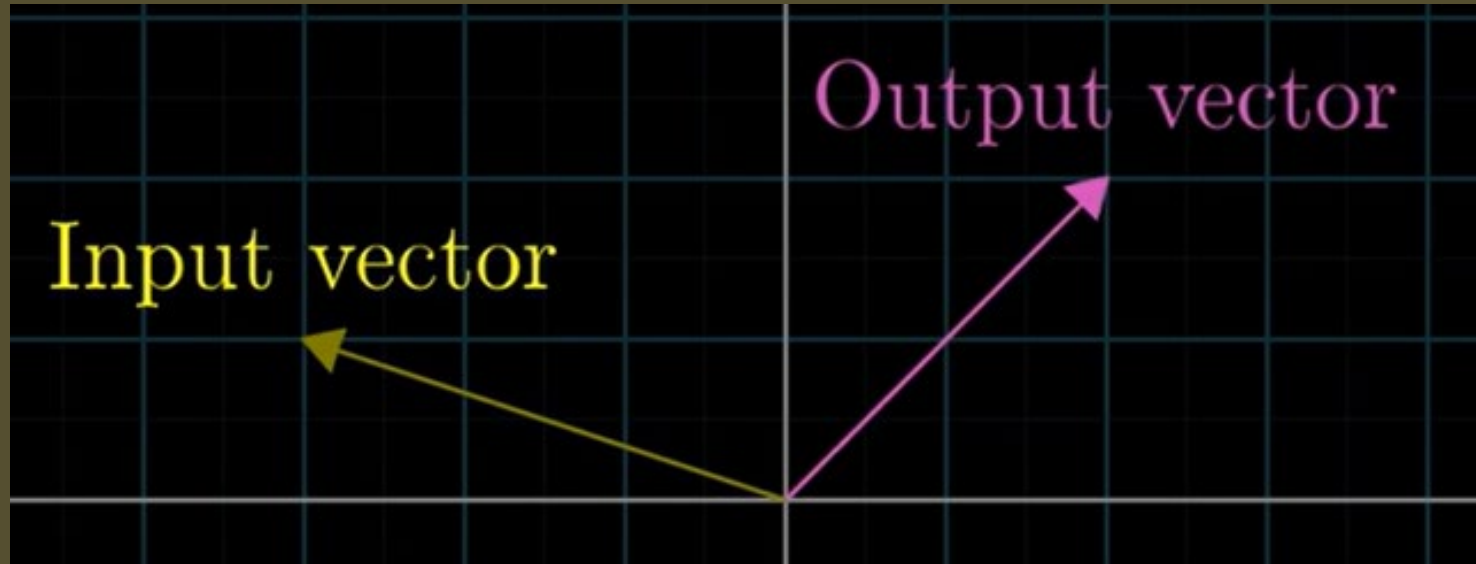
**Cómo sería un ejemplo de tres vectores
con un sistema generador de dos
dimensiones?**

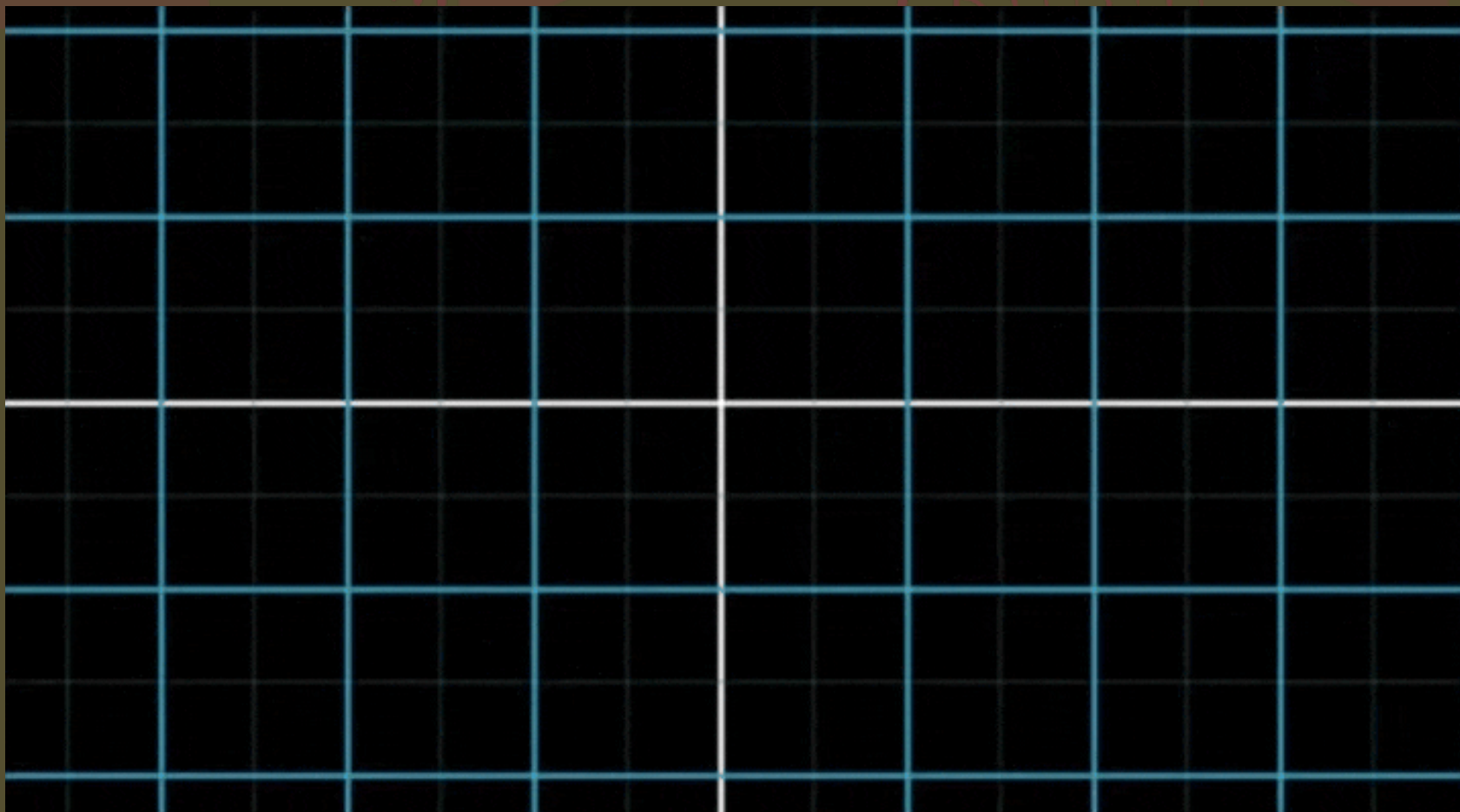
¿Cómo podríamos definir una base vectorial?

¿Y una base ortogonal?

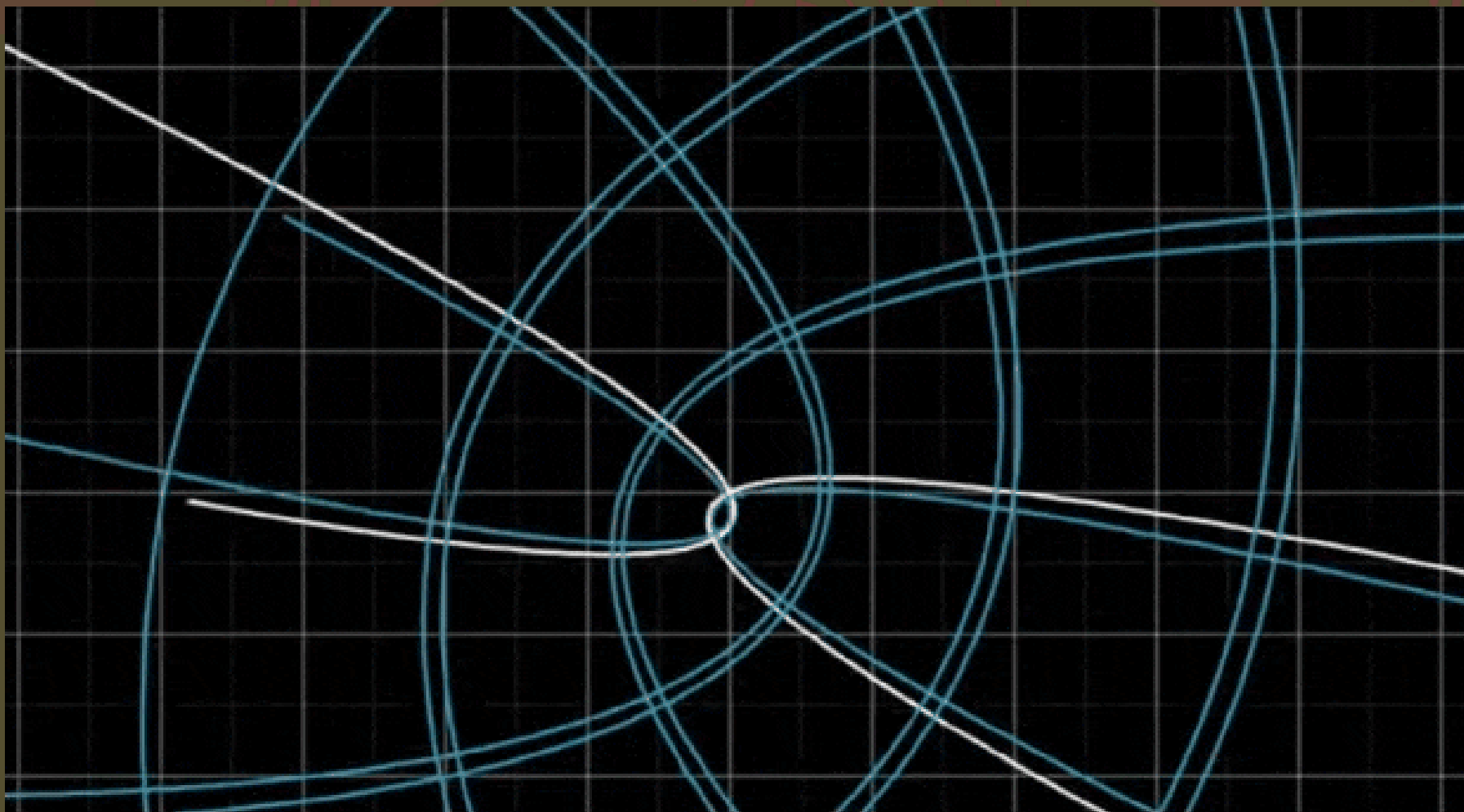
¿Y una base ortonormal?

¿qué es una transformación lineal? ¿qué propiedades tiene?



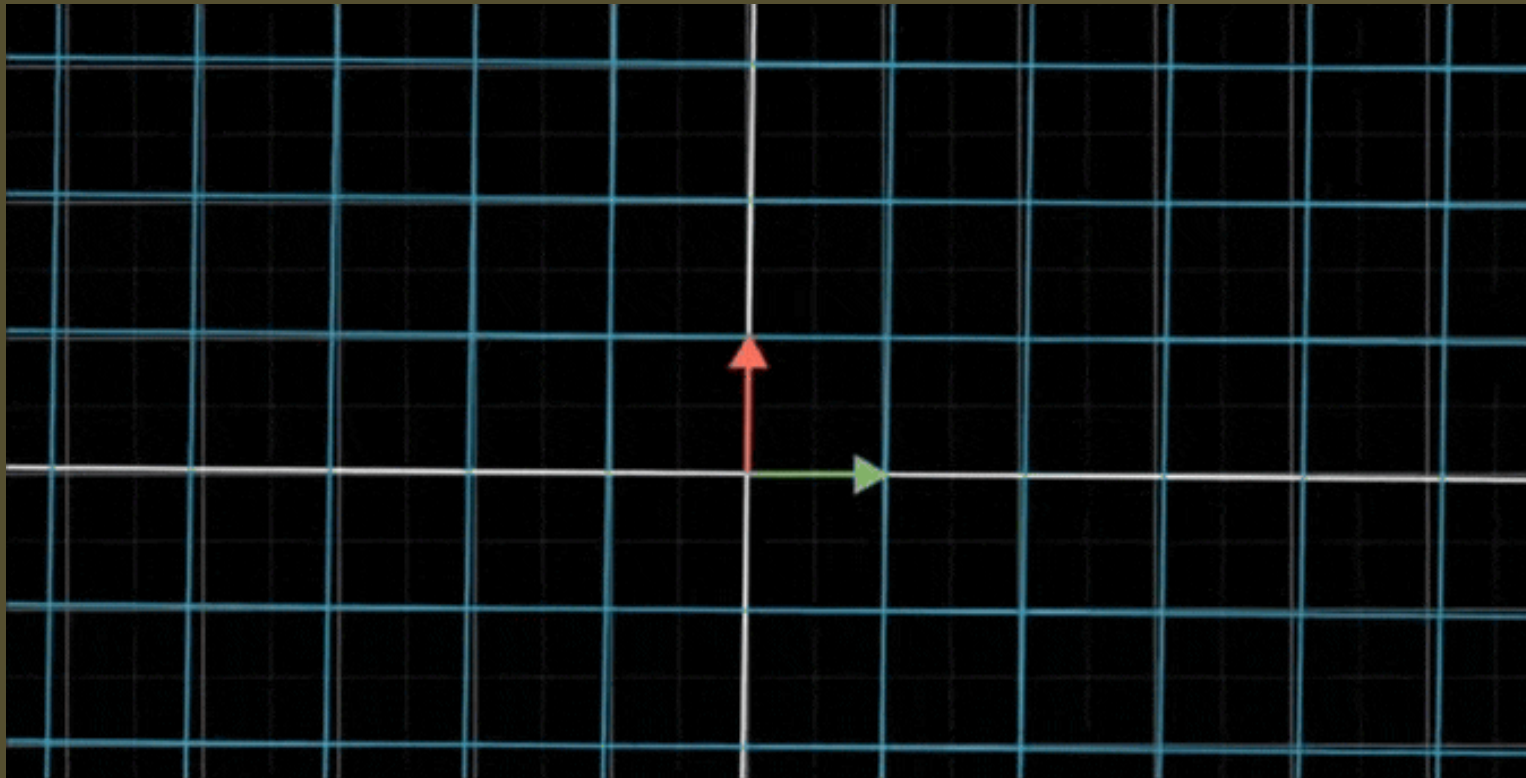


Fuente imagen: 3blue1brown




Fuente imagen: 3blue1brown

¿cómo se representa matricialmente?



Fuente imagen: 3blue1brown


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

The header features a dark olive green background with a series of repeating geometric patterns. These patterns include concentric semi-circular lines, solid semi-circles, and semi-circles filled with small dots, all in a slightly lighter shade of green.

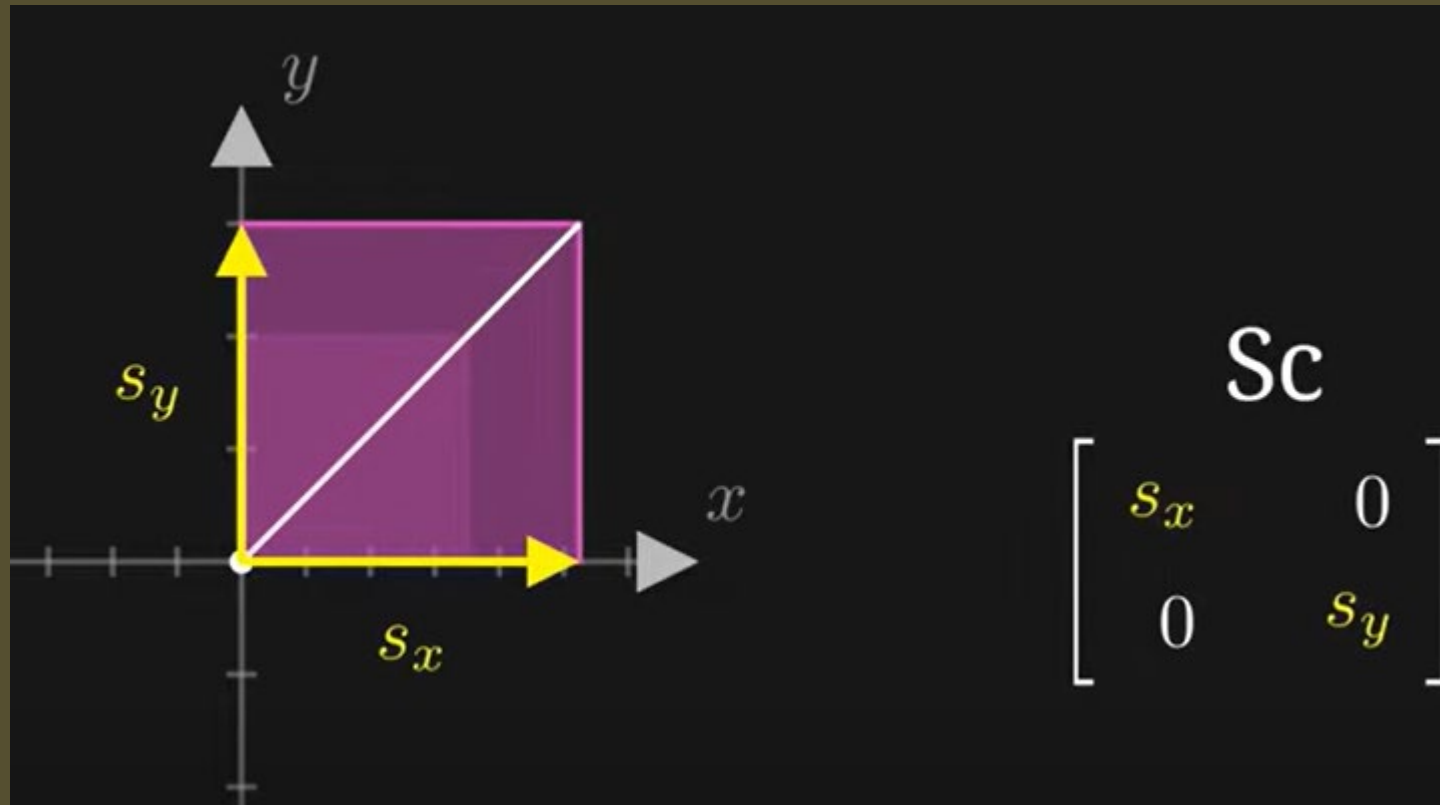
**¿Qué pasa si la matriz tiene vectores
linealmente dependientes?**

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

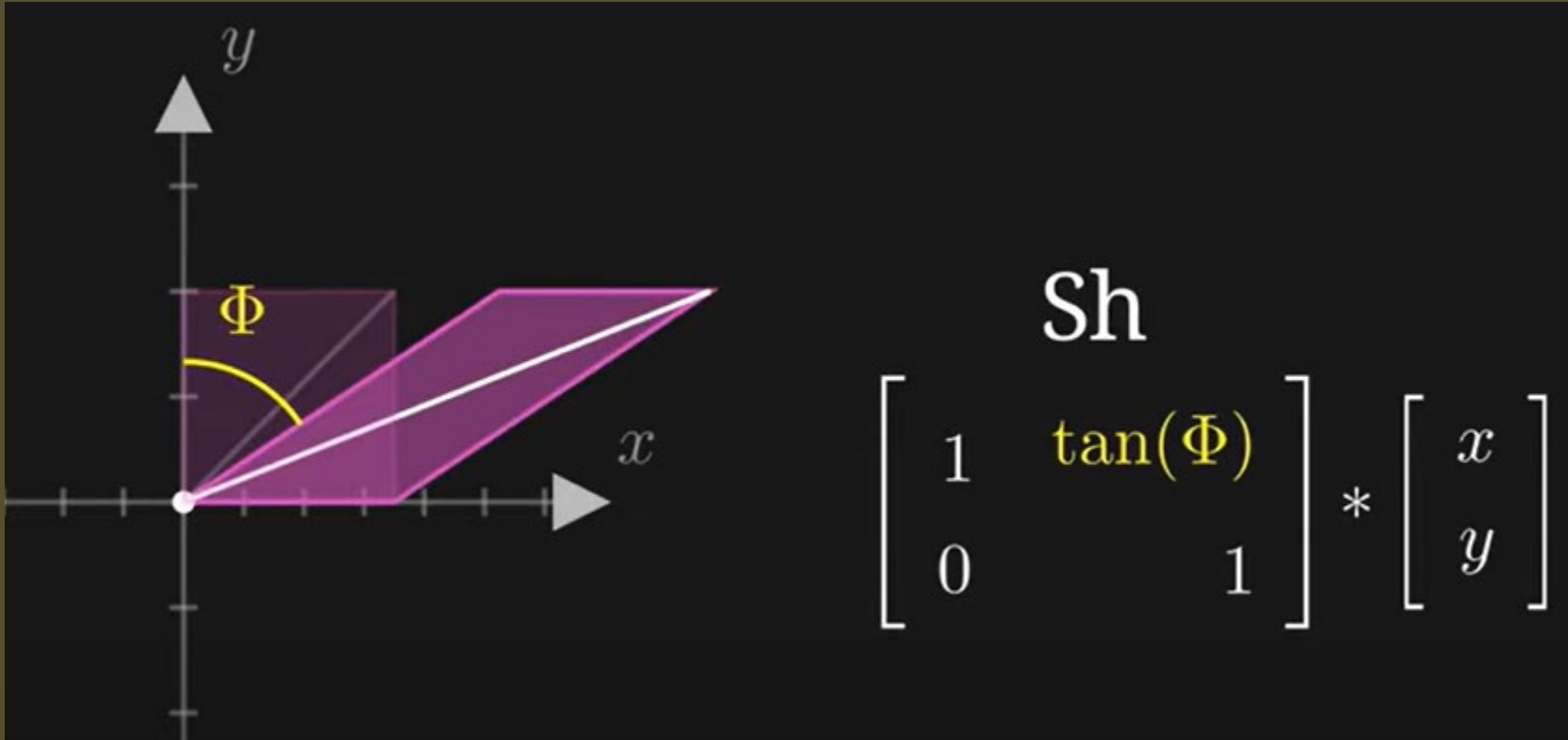
Linearly dependent
columns



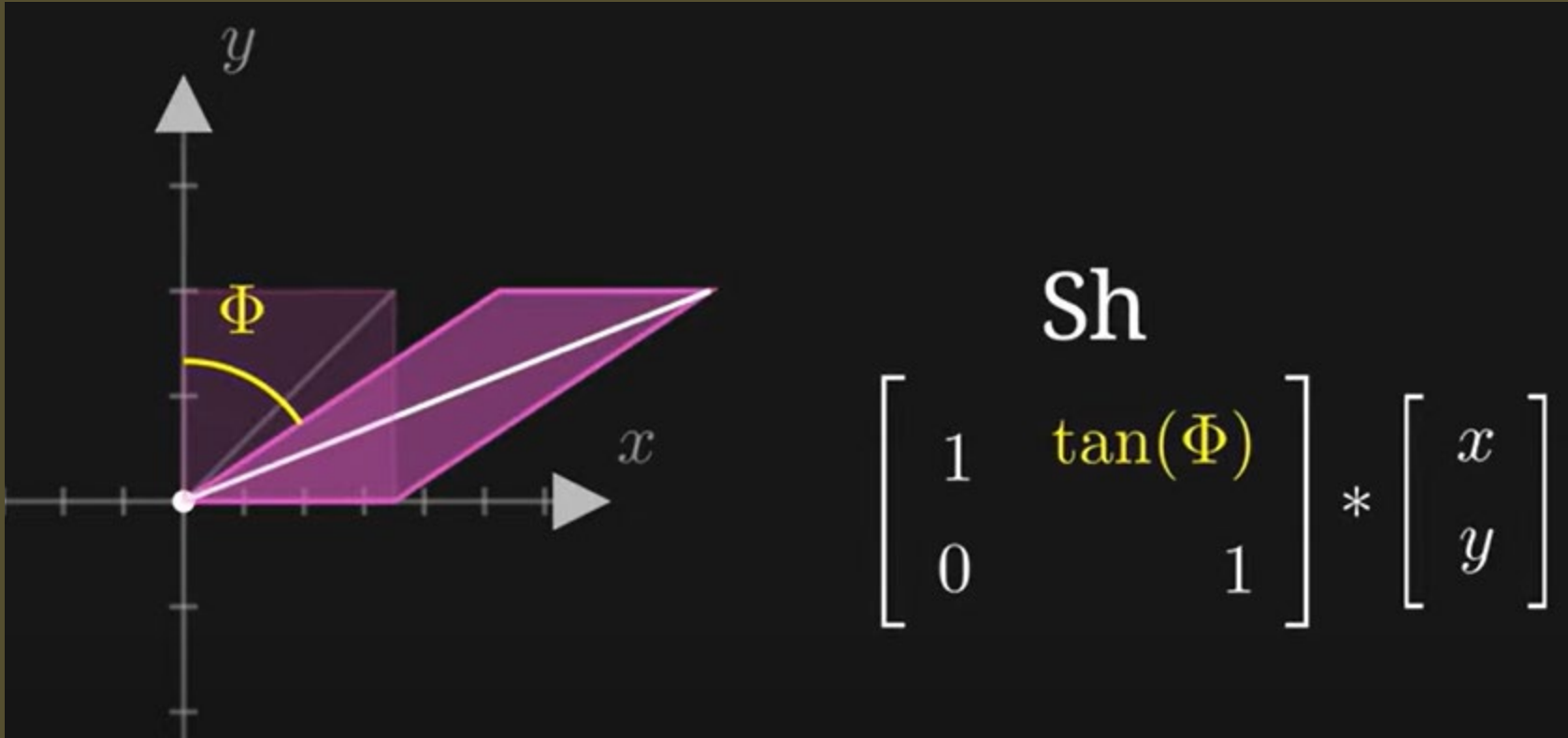
Formas de transformación: Escalar



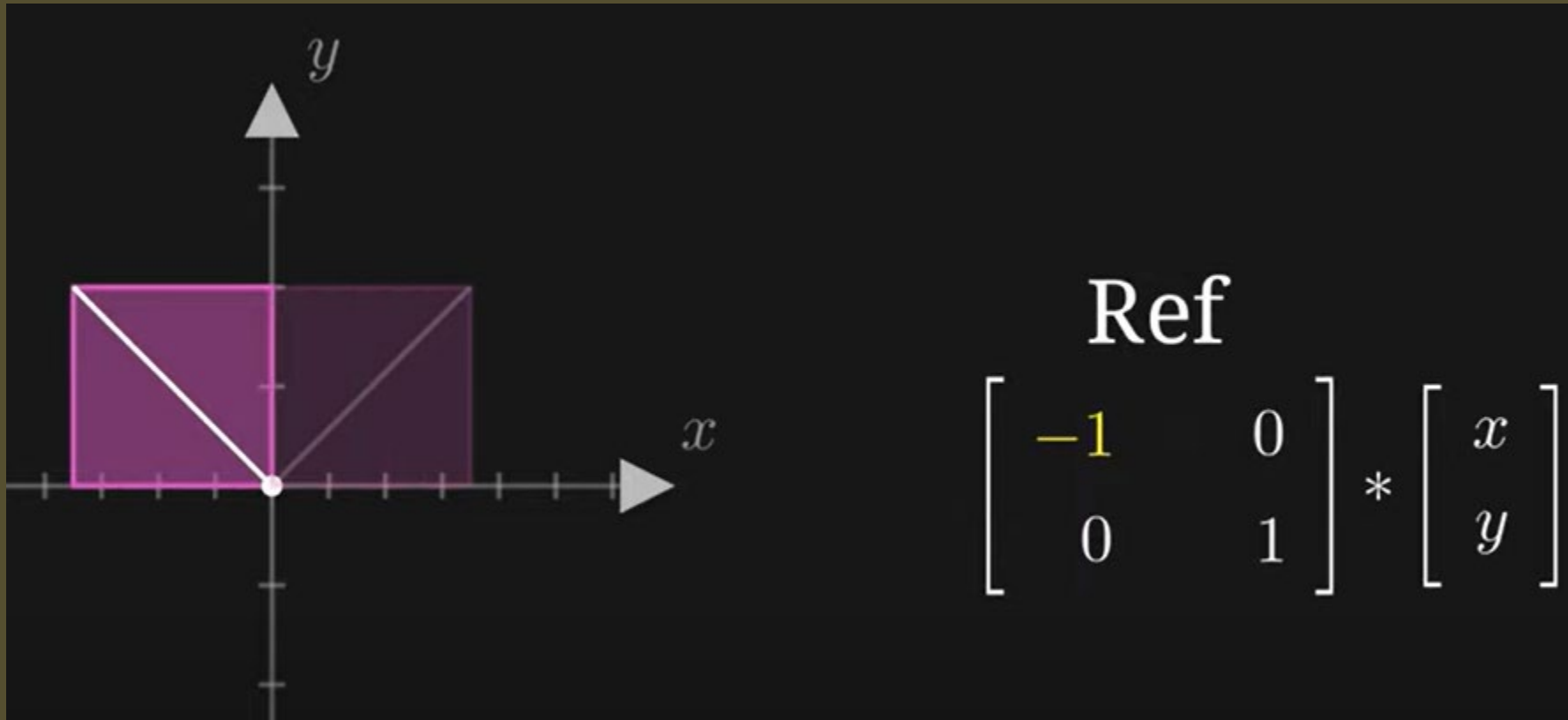
Formas de transformación: Shear



Formas de transformar: Rotación

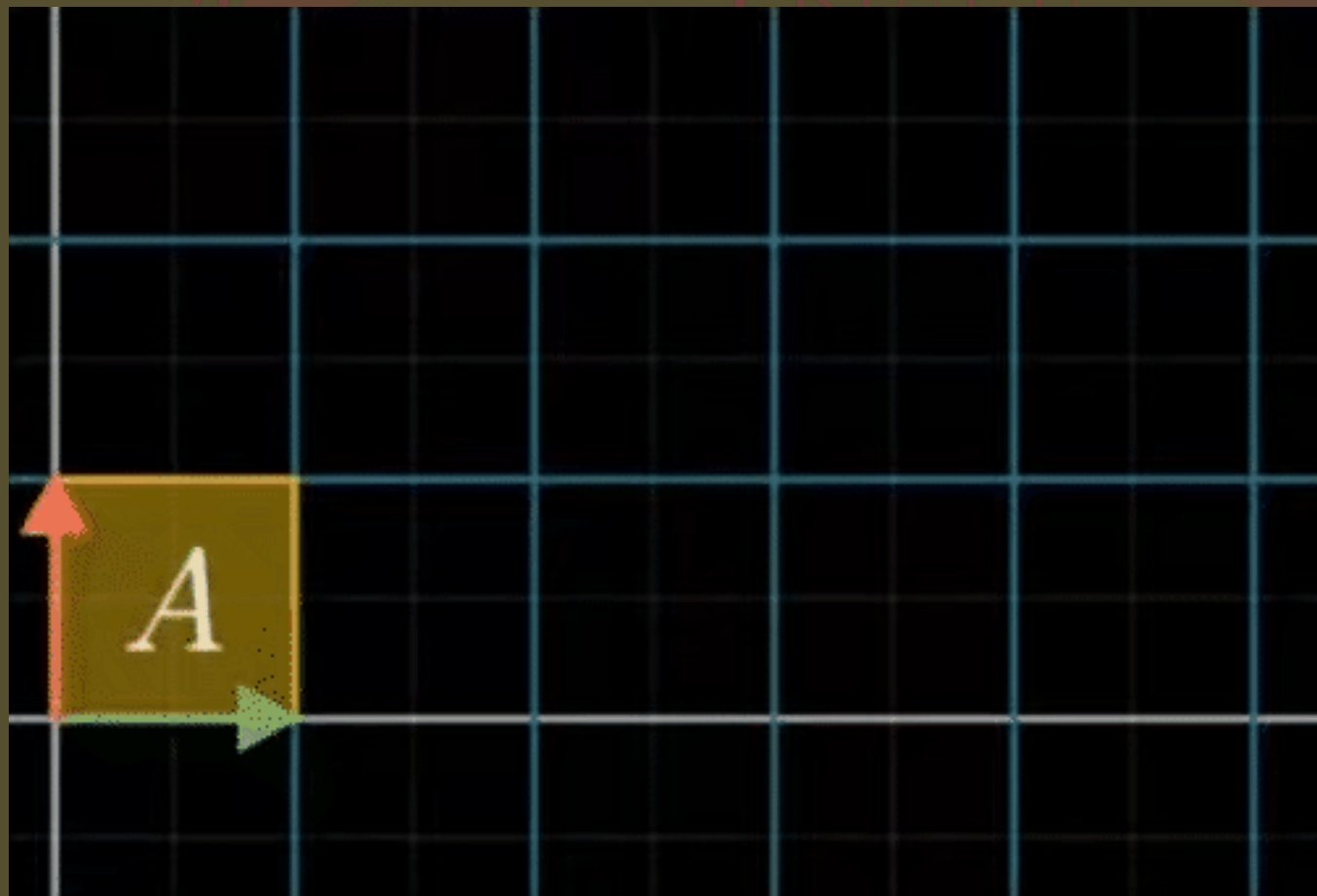


Formas de rotación: Reflexión



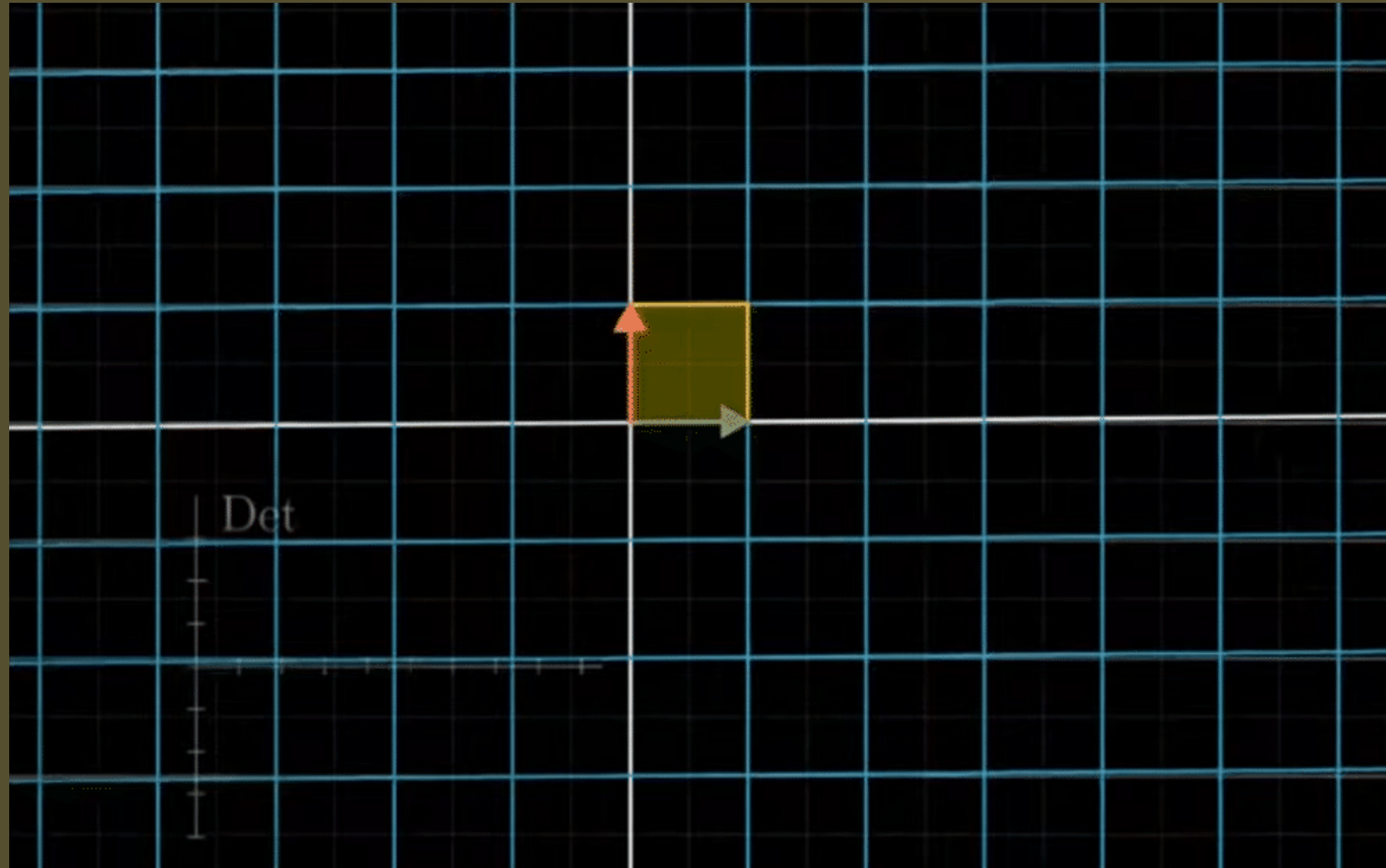
The header features a series of overlapping semi-circular shapes in a dark brown color. Each semi-circle is filled with a different pattern: some have concentric curved lines, some have a grid of small dots, and others have a pattern of small, elongated, teardrop-like shapes.

¿Qué es el determinante?



Fuente imagen: 3blue1brown

¿Un determinante negativo? ¿qué sea cero?



Fuente imagen: 3blue1brown

¿qué implica resolver esto?

$$\begin{array}{l} 2x + 5y + 3z = -3 \\ 4x + 0y + 8z = 0 \\ 1x + 3y + 0z = 2 \end{array} \rightarrow \overbrace{\begin{bmatrix} 2 & 5 & 3 \\ 4 & 0 & 8 \\ 1 & 3 & 0 \end{bmatrix}}^A \overbrace{\begin{bmatrix} x \\ y \\ z \end{bmatrix}}^{\vec{x}} = \begin{bmatrix} -3 \\ 0 \\ 2 \end{bmatrix}$$

The header features a series of overlapping semi-circles and concentric arcs in a dark brown color, creating a geometric pattern against a lighter brown background.

**¿por qué si el determinante es cero no
hay matriz inversa?**