

TEORIA

VETORES

Vector: An ordered list of numbers

Dimensionality: the number of numbers (elements)

$$\begin{bmatrix} 1 \\ 2 \\ 3 \end{bmatrix} \neq \begin{bmatrix} 2 \\ 1 \\ 3 \end{bmatrix}$$

↑ ↑
"Column Vector"

$$\begin{bmatrix} 1 & 3 & 2 & 5 & 4 \end{bmatrix} \rightarrow \text{"Row Vectors"}$$

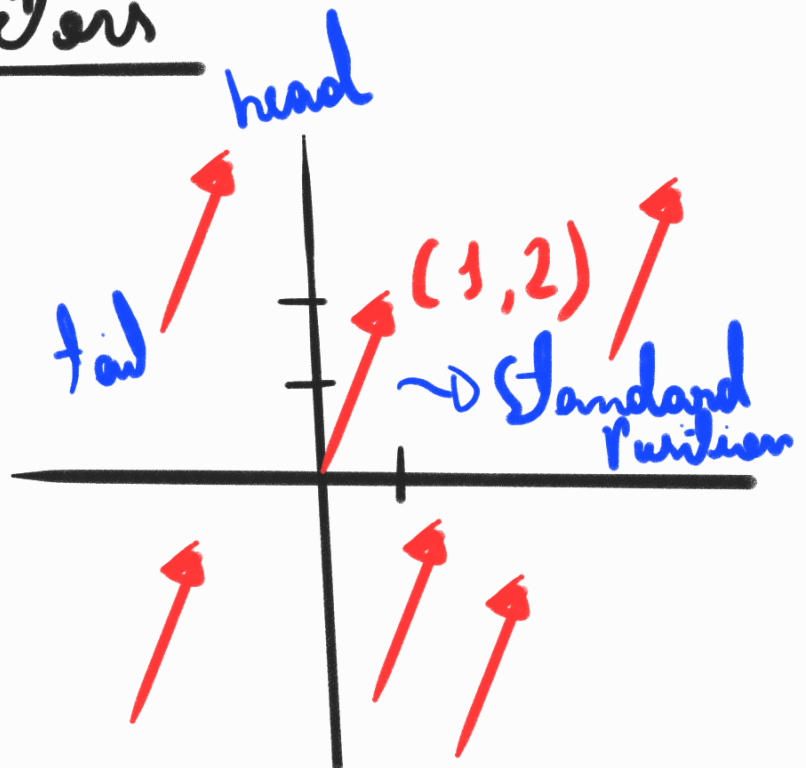
↖
[-1 -14]

Vector Notation

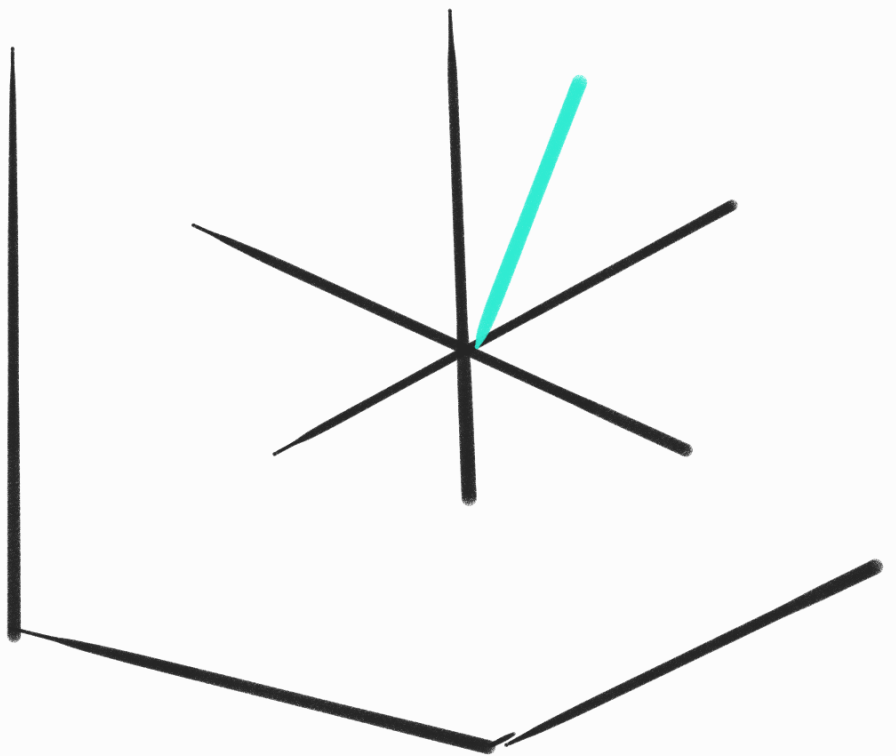
$$\begin{bmatrix} 1 \\ 0 \\ \pi \\ 5 \\ -2 \end{bmatrix} = V \text{ or } \vec{v} \text{ or } \vec{v} \text{ or } V \quad \swarrow \text{Take letter}$$

Geometric Vectors

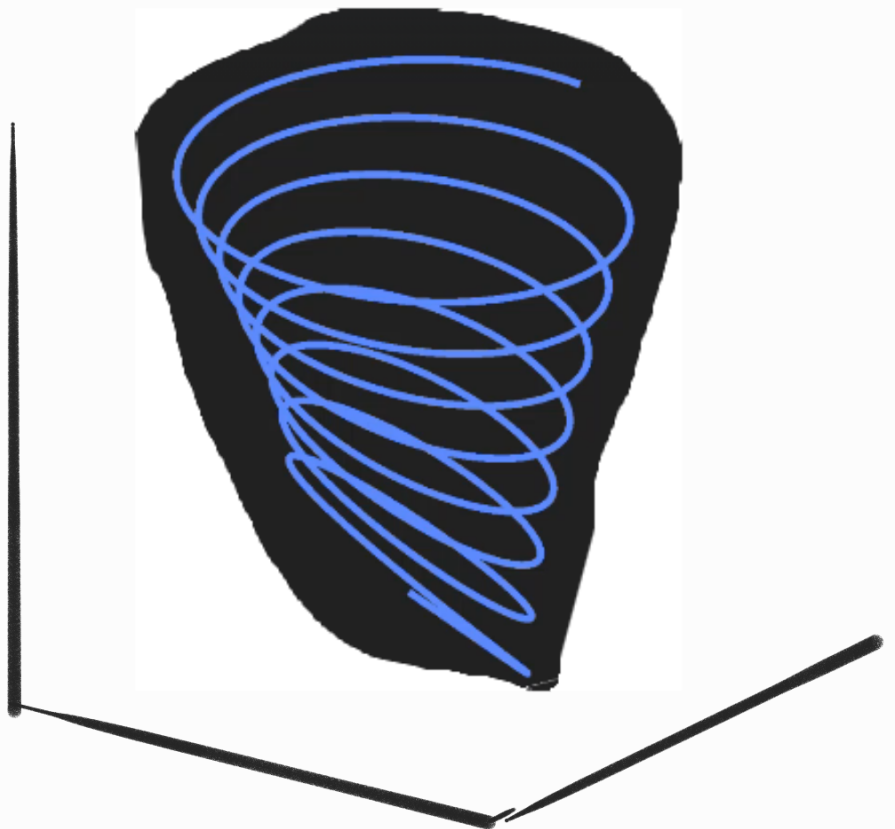
$[1 \ 2]$



$$[1 \ 2 \ 3]$$



$$\begin{bmatrix} \sin(x) \\ x \cos(x) \\ x \end{bmatrix}$$



Creating Vectors in Python

$$V_2 = [3, -2] \quad (2D) \quad x=3, y=-2$$

$$V_3 = [4, -3, 2] \quad (3D) \quad x=4, y=-3, z=2$$

transpose (Row to Column (or vice-versa))

$$V_{3T} = \text{np.transpose}(V_3)$$

Creating Graphics

2D

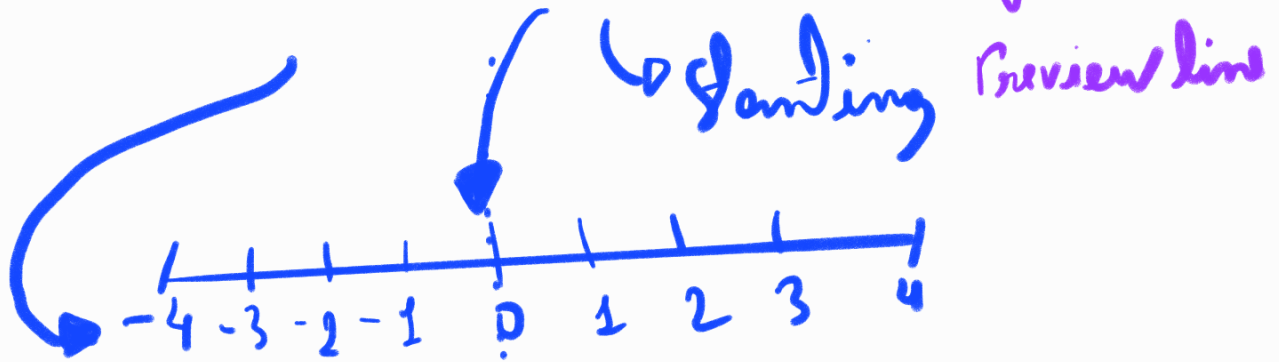
$$\text{plt.plot}([0, V_2[0]], [0, V_2[1]])$$

it starts at the origin

$$\text{plt.axis('equal')}$$

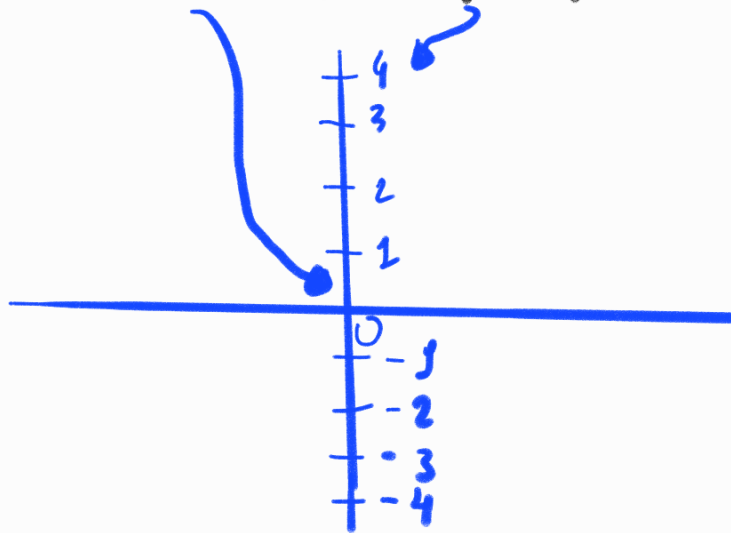
Ensures that the scale of the X-axis is equal to that of the Y-axis.

`plt.plot([-4,4], [0,0], 'k--')`



this draws a horizontal line starting -4 to 4 on the X-axis, centered at 0 on the Y-axis

`plt.plot([0,0], [-4,4], 'k--')`



`plt.grid()` → Add lines.

to facilitate the reading of coordinates
→ this command turns on the background grid lines

`plt.axis((-4, 4, -4, 4))`

This sets the boundaries of your graph's view.
It tells Python exactly where to "cut" the common frame.

`(x-min, x-max, y-min, y-max)`

