$$X \rightarrow \mathbb{R}^+$$

Positive Real

Vector norm:
a number that says
how big is a
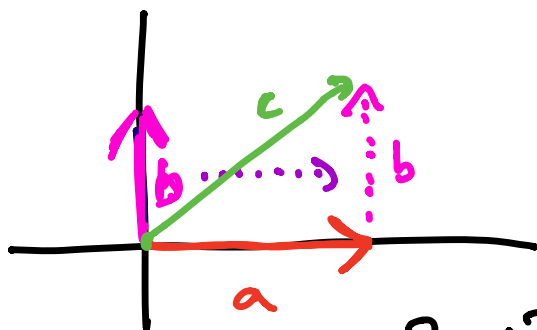vector

A?   B?

Functions

Set   Set

Domain   Range

input   output
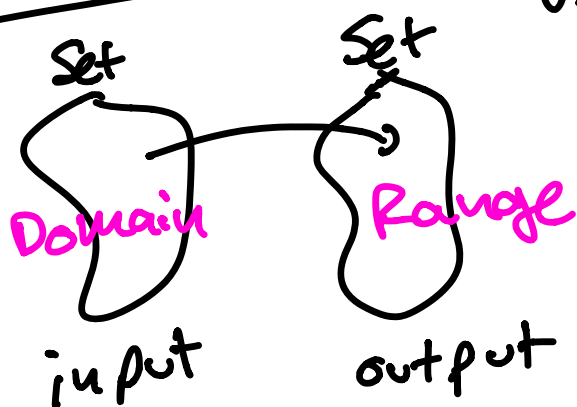
$$X \rightarrow \mathbb{R}^+$$

Vector   Positive real

Euclidean norm

Norm is a
function mapping
from a vector to
a positive real

$$a^2 + b^2 = c^2$$

$$\langle 2,3 \rangle \rightarrow \mathbb{R}^+$$

What is $a+b$? $= c$

How long is c?

$$\sqrt{a^2 + b^2} = \|c\|_2$$
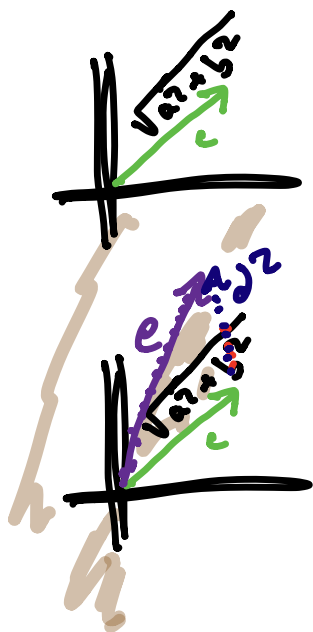
Euclidean norm

$$c^2 + d^2 = e^2$$

$$a^2 + b^2 + d^2 = e^2$$

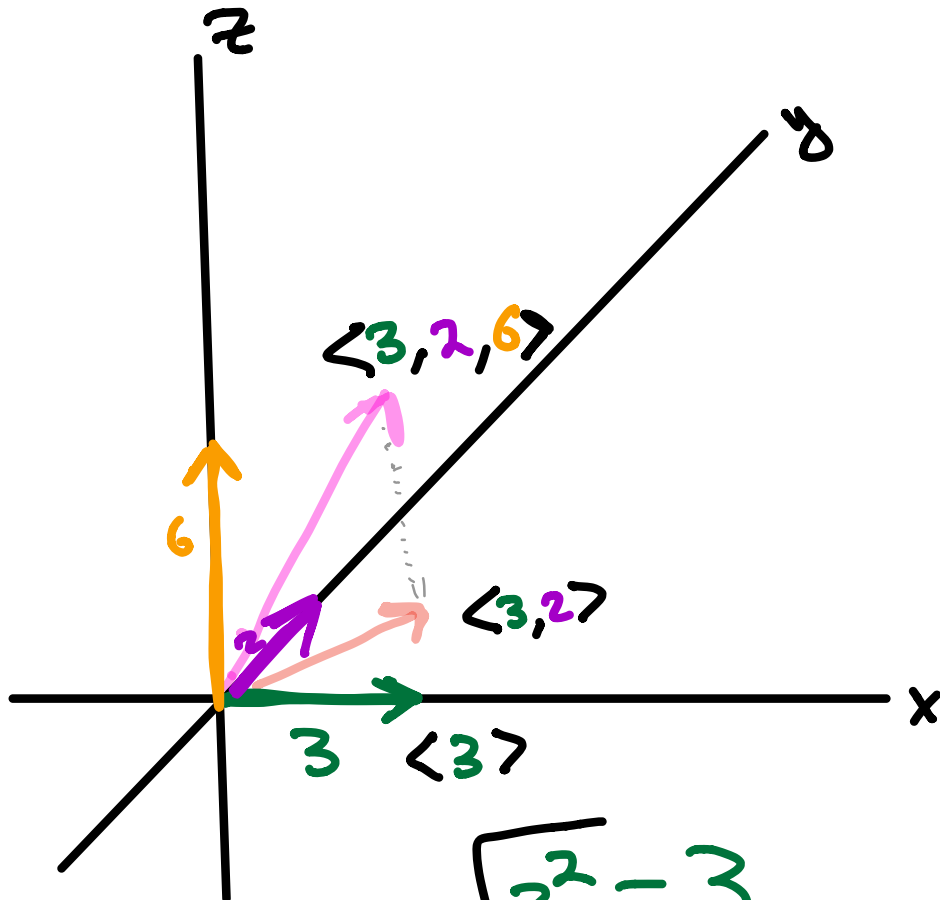$$\sqrt{a^2 + b^2 + d^2} = \sqrt{e^2} = e$$

$$\|X\|_2 = \sqrt{\sum x_i^2}$$

$$\|X\|_1 = \text{"} L1 \text{ norm"}$$

Sum of absolute values
of all components
of a vector

$$x = \langle 2, -2 \rangle = \|X\|_1 = 4$$

Another attempt to draw post
class

$$\sqrt{3^2} = 3 \qquad 1D$$

$$\sqrt{2^2 + 3^2} = \sqrt{13} \qquad 2D$$

$$\sqrt{2^2 + 3^2 + 6^2} = \sqrt{49} \qquad 3D$$