Vector properties/operations

Length/norm/magnitude

$$||x|| = \sqrt{2}x^2 = \sqrt{10}$$

-Unit vector: length=1
$$\frac{x}{2} = \frac{x}{||x||} = \frac{1}{3/510}$$

Scalar multiple
$$a\bar{x} = \begin{bmatrix} ax_i \\ ax_d \end{bmatrix}$$

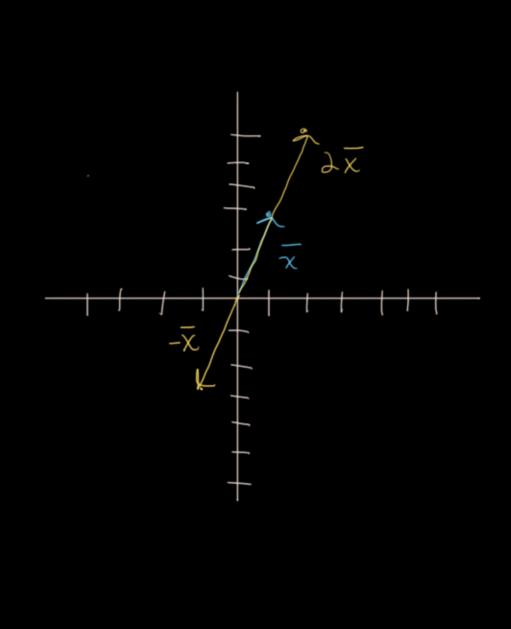
$$\overline{X} = \begin{bmatrix} 3 \end{bmatrix}$$
 $3\overline{X} = \begin{bmatrix} 3 \end{bmatrix}$

$$-1\overline{\chi} = \begin{bmatrix} -1\\ 3 \end{bmatrix}$$

Vector addition

$$\overline{X} + \overline{y} = \begin{bmatrix} x_1 + y_1 \\ x_2 + y_2 \end{bmatrix}$$

$$\overline{\chi} = \begin{bmatrix} 1 \\ 3 \end{bmatrix}$$
 $\overline{5} = \begin{bmatrix} 5 \\ 1 \end{bmatrix}$



 $C = \sqrt{a^2 + b^2}$

Geometric view

=> Tutorial

Inner product/dot product

$$\overline{\chi} \cdot \overline{y} = \overline{\chi} \times_{\gamma} y_{\gamma}$$

$$\overline{\chi} = \begin{bmatrix} 1 \\ 3 \end{bmatrix}$$
 $\overline{y} = \begin{bmatrix} 5 \\ 1 \end{bmatrix}$

$$7.\overline{y} = 1(5) + 3(1) = 8 + 5 \text{ calar}$$

$$\overline{\chi} \cdot \overline{y} = \overline{y} \cdot \overline{\chi}$$
 Commutative
 $\overline{\chi} \cdot (\overline{y} + \overline{z}) = \overline{\chi} \cdot \overline{y} + \overline{\chi} \cdot \overline{z}$ Distributive

$$||x|| = \sqrt{x \cdot x}$$

Dot product in neuro