i.e $\|\overrightarrow{P_1P_2}\| = \sqrt{(x_2-x_1)^2+(y_2-y_1)^2+(z_2-z_1)^2}$

where $P_1=(x_1,y_1,z_1)$ & $P_2=(x_2,y_2,z_2)$ in $\mathbb{R}^3$

While in $\mathbb{R}^2$

$\|\overrightarrow{P_1P_2}\| = \sqrt{(x_2-x_1)^2+(y_2-y_1)^2}$ where $P_1=(x_1,y_1)$ and $P_2=(x_2,y_2)$ in $\mathbb{R}^2$.

Note: The value of zero vector $\vec{O}$ is 0 i.e. $\|\vec{O}\|=0$.

Definition: Any two vectors $\vec{u}$ and $\vec{v}$ are considered to be equal (or equivalent) if they have the same length (value) and same direction, in which case we write $\vec{u}=\vec{v}$

Geometrically, two vectors are equal if they are translations of one another, thus the three vectors below are equal, even though they are in different positions.