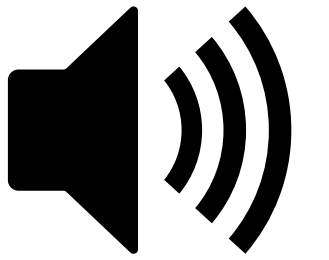


Euclidean Space and Cartesian Coordinate System

Euclidean space



Originally introduced by greek mathematicians, in particular, Euclid of Alexandria, for modelling the physical universe.

Mathematically, Euclidean space is represented using \mathbb{R}^n , where \mathbb{R} stands for the set of Real numbers, and n stands for the number of dimensions.

For two dimensional space, Euclidean space can be expressed as $\mathbb{R} \times \mathbb{R}$, or \mathbb{R}^2 .

Example: Let's say we denote each set (for each dimension) by Z' , where $Z' = \{-3, -2, -1, 0, 1, 2, 3\}$, then such a two-dimensional space can be represented as the cross product of Z' with Z' , which can be given by all possible points in that space and those will be

$$\begin{aligned} &\{-3, -3\}, \{-3, -2\}, \dots \{-3, 2\}, \{-3, 3\}, \\ &\{-2, -3\}, \{-2, -2\}, \dots \{-2, 2\}, \{-2, 3\}, \\ &\quad \vdots \quad \vdots \quad \quad \vdots \quad \vdots \quad \dots \quad \vdots \quad \vdots \quad \quad \vdots \quad \vdots \\ &\{3, -3\}, \{3, -2\}, \dots \{3, 2\}, \{3, 3\} \end{aligned}$$