Definition

The **Cartesian product** or **product** of the two sets A and B is the set

$$A \times B = \{(a, b) : a \in A \wedge b \in B\}.$$

of all ordered pairs (or vectors) where the first component is in A and the second is in B.

Example

$$\mathbb{R}^2 = \mathbb{R} \times \mathbb{R} = \{(x, y) : x \in \mathbb{R} \wedge y \in \mathbb{R}\}.$$