$X = [0,1] \subseteq \mathbb{R}$ $[0,1] = \{x : x \in \mathbb{R}, 0 \leq x \text{ and } x \leq 1\}$
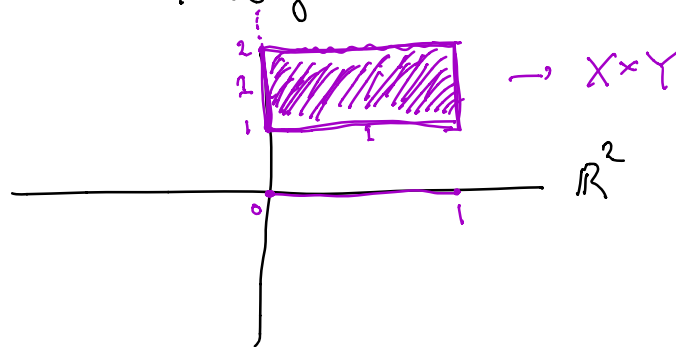
$Y = [1,2] \subseteq \mathbb{R}$ $[1,2] = \{x : x \in \mathbb{R}, 1 \leq x \leq 2\}$.

what does $X \times Y$ look like.

$X \times Y = \{(x,y) : x \in [0,1] \text{ and } y \in [1,2]\}$.

$X \times Y \subseteq \mathbb{R} \times \mathbb{R} = \{(x,y) : x \in \mathbb{R} \text{ and } y \in \mathbb{R}\}$.

$(x,y) \in X \times Y$ is an ordered pair of real numbers, therefore it belongs to $\mathbb{R} \times \mathbb{R} = \mathbb{R}^2$

$\longrightarrow X \times Y$

$\mathbb{R}^2$

Cartesian Product of intervals gives rectangles in $\mathbb{R}^2$.