

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

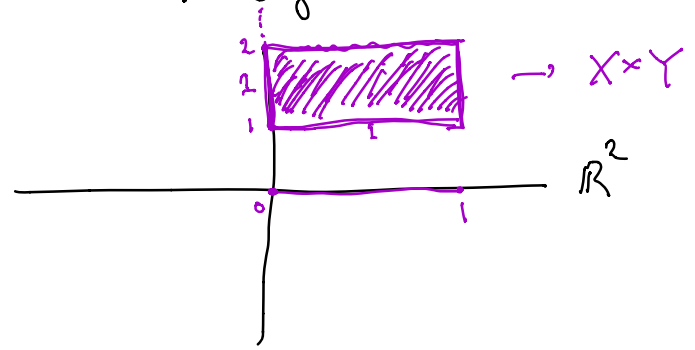
$$Y = \underline{[1, 2]} \subseteq \mathbb{R} \quad [1, 2] = \{x: x \in \mathbb{R}, 1 \leq x \leq 2\}$$

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 $\mathbb{R} \times \mathbb{R} = \mathbb{R}^2$



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