

$X \times Y$

$$x_1 : y_1 \leq x_2 : y_2 \Leftrightarrow \begin{cases} x_1 \leq x_2 \\ y_1 \leq y_2 \end{cases}$$

$$\overline{x : y} \mid \overline{x : y} = \underline{x} \mid \underline{x} \times \underline{y} \mid \underline{y}$$

$$\text{Hasse}_{X \times Y} = \text{Hasse}_X \times \text{Hasse}_Y$$