$$\top_{\bigtriangleup} 2 = \{U \subset \top\} \in \bigtriangleup$$

$$\begin{cases} U \underset{\text{meet}}{\cap} V & = \begin{cases} x \in \top \\ x \in U \wedge x \in V \end{cases} \\ x \in U \cap V & \Leftrightarrow x \in U \wedge x \in V \end{cases}$$

$$\begin{cases} U \underset{\text{join}}{\cup} V & = \begin{cases} x \in \top \\ x \in U \vee x \in V \end{cases} \\ x \in U \cup V & \Leftrightarrow x \in U \vee x \in V \end{cases}$$

$$U \cap V \underset{\text{komm}}{=} V \cap U$$

$$U \cup V \overset{\text{komm}}{=} V \cup U$$

$$\underbrace{U \cap V} \cap W \underset{\text{assoc}}{=} U \cap \underbrace{V \cap W}$$

$$\underbrace{U \cup V} \cup W \overset{\text{assoc}}{=} U \cup \underbrace{V \cup W}$$

$$\underbrace{U \cap V} \cup W \underset{\text{distr}}{=} \underbrace{U \cup W} \cap \underbrace{V \cup W}$$

$$\subset: \quad x \in \underbrace{U \cap V} \cup W \Rightarrow \vee \begin{cases} x \in U \cap V & \Rightarrow \wedge \begin{cases} x \in U & \Rightarrow x \in U \cup W \\ x \in V & \Rightarrow x \in V \cup W \end{cases} \Rightarrow x \in \underbrace{U \cup W} \cap \underbrace{V \cup W} \\ x \in W & \Rightarrow \wedge \begin{cases} x \in U \cup W & \Leftarrow W \subset U \cup W \\ x \in V \cup W & \Leftarrow W \subset V \cup W \end{cases} \Rightarrow x \in \underbrace{U \cup W} \cap \underbrace{V \cup W} \end{cases}$$

$$\supset: \quad x \in \underbrace{U \cup W} \cap \underbrace{V \cup W} \Rightarrow x \in U \cup W \wedge x \in V \cup W$$

$$\text{if } x \in W \Rightarrow x \in \underbrace{U \cap V} \cup W$$

$$\text{if } x \notin W \Rightarrow \begin{cases} x \in U \cup W & \Rightarrow x \in U \\ x \in V \cup W & \Rightarrow x \in V \end{cases} \Rightarrow x \in U \cap V \subset \underbrace{U \cap V} \cup W \Rightarrow x \in \underbrace{U \cap V} \cup W$$

$$\underbrace{U \cup V} \cap W \overset{\text{distr}}{=} \underbrace{U \cap W} \cup \underbrace{V \cap W}$$

$$\subset: \quad x \in \underbrace{U \cup V} \cap W \Rightarrow x \in U \cup V \wedge x \in W \Rightarrow \begin{cases} x \in U & \Rightarrow x \in U \cap W \\ x \in V & \Rightarrow x \in V \cap W \end{cases} \Rightarrow x \in \underbrace{U \cap W} \cup \underbrace{V \cap W}$$

$$\supset: \quad x \in \underbrace{U \cap W} \cup \underbrace{V \cap W} \Rightarrow \begin{cases} x \in U \cap W & \Rightarrow x \in \underbrace{U \cup V} \cap W \\ x \in V \cap W & \Rightarrow x \in \underbrace{U \cup V} \cap W \end{cases} \Rightarrow x \in \underbrace{U \cup V} \cap W$$

$$U \cap U \underset{\text{idem}}{=} U$$

$$U \cup U \overset{\text{idem}}{=} U$$

$$\begin{cases} \bigcap\limits_i U_i & \overset{\text{family}}{=\!=}_{\text{join}} \begin{cases} x \in \mathfrak{h} \\ \bigwedge\limits_i x \in U_i \end{cases} \\ x \in \bigcap\limits_i U_i & \Leftrightarrow \bigwedge\limits_i x \in U_i \end{cases}$$

$$\begin{cases} \bigcup\limits_i U_i & \overset{\text{family}}{=\!=}_{\text{meet}} \begin{cases} x \in \mathfrak{h} \\ \bigvee\limits_i x \in U_i \end{cases} \\ x \in \bigcup\limits_i U_i & \Leftrightarrow \bigvee\limits_i x \in U_i \end{cases}$$

$$I \in A \cdots Z = \text{ Alphabet}$$

$$U_I = \left\{ \begin{array}{c} \text{Staedte} \\ \text{Anfangsbuchstabe=I} \end{array} \right\} = \text{ I-Stadt}$$

$$\text{Marburg } \in \text{ M-Stadt}$$

$$\text{Wetzlar } \in \text{ W-Stadt}$$

$$\bigcup_{I = A \cdots Z} \text{I-Stadt } = \text{ Stadt}$$