RPROP

MILAN WIKARSKI

NICK: <u>WIKI</u>

1. R je reflexívna $\Leftrightarrow \Delta X \subseteq R$

$\Delta X = \{(x, x) \mid x \in X\}$

$\forall x \in X: (x, x) \in R \Rightarrow \underline{\underline{\Delta X \subseteq R}}$

---

2. R je symetrická $\Leftrightarrow R = R^{-1}$ $\quad R \subseteq X \times X$

$\forall (x, y) \in X \times X:$

1. BUĎ $(x, y) \notin R \Rightarrow (y, x) \notin R^{-1}$
2. ALEBO $(x, y) \in R \Rightarrow (y, x) \in R^{-1} \wedge$
   $(y, x) \in R \Rightarrow (x, y) \in R$

$\Rightarrow xRy \wedge yRx \Leftrightarrow xR^{-1}y \wedge yR^{-1}x$

DEFINÍCIA SYMETRIE

$\Rightarrow \underline{\underline{R = R^{-1}}}$

---

3. R je antisymetrická $\Leftrightarrow R \cap R^{-1} \subseteq \Delta X$

$R^{-1} = \{(x, y) \mid yRx\}$

$\Rightarrow R \cap R^{-1} = \{(x, y) \mid xRy \wedge yRx\}$

Z ANTISYMETRIE: $xRy \wedge yRx \Leftrightarrow x = y$

$\Rightarrow R \cap R^{-1} = \{(x, x) \mid xRx\}$

$\Rightarrow \underline{\underline{R \cap R^{-1} \subseteq \Delta X}}$

4. R je tranzitívna $\Leftrightarrow R \circ R \subseteq R$

NECH: $R' = R \circ R$

Z TRANZITIVITY: xRy [redacted] $\wedge\ yRz$ [redacted] $\Rightarrow xRz$

$R' = \{(x, z) \mid xRy \wedge yRz\}$

$\Rightarrow xRz \Leftrightarrow xR'z \quad \Rightarrow \underline{\underline{R \circ R \subseteq R}}$