

$$\underline{P(x)} \vee \underline{P(y)} \quad a > b$$

- $\sigma = \{x \rightarrow a, y \rightarrow b\}$
- $\sigma = \{x \rightarrow b, y \rightarrow a\}$

$$R(x, y) \vee R(x, f(a))$$

$$\rightarrow R(x', a) \vee \leftarrow \quad \sigma = \{x \rightarrow x', y \rightarrow a\}$$

no inference

$P(x) \quad \{x \rightarrow a\}$

$P(a) \quad \rightsquigarrow$ complicated ordering
(L, σ) completeness proof

\rightsquigarrow level of redundancy

$P(x) \vee \neg P(x)$ taut
 $P(x) \vee \neg P(y)$ no tautology
unsat $\left\{ \begin{array}{l} P(a) \\ \neg P(b) \end{array} \right.$

$$C = P(x) \vee P(y) \vee R(x, a) \vee R(y, a)$$

Condense: $\sigma = \{x \rightarrow y\}$

$$C\sigma = P(y) \vee P(y) \vee R(y, a) \vee R(y, a)$$

$$\text{var } p(C\sigma) = P(y) \vee R(y, a)$$

$P(x) \vee P(y) \vee R(x, y)$ no condensation

$$(1) \quad \neg R(x, y) \vee \neg R(y, z) \vee R(x, z) \quad \text{BS}$$

$$(2) \quad \neg R(x, x) \quad \text{KBO}$$

$$a \rightarrow b \rightarrow R$$

$$(3) \quad \neg R(x, a) \vee R(x, b)$$

* max

$$1.3 \text{ SL } 2.1: \sigma = \{x \rightarrow x', z \rightarrow x'\} \quad \neg R(x', y) \vee \neg R(y, x')$$

$$3.1 \text{ SL } 1.3: \sigma = \{x'' \rightarrow x, z \rightarrow a\} \quad \neg R(x, y) \vee \neg R(y, a)$$

$$1.1 \text{ SL } 1.3: \quad \neg R(x, y) \vee \neg R(y, z) \vee R(x, z)$$

$$\sigma = \{x' \rightarrow x, z' \rightarrow z\} \quad \neg R(x, y) \vee \neg R(y, z) \vee R(x, z)$$

$N \cup \{P(a) \vee P(b)\}$ unsat

iff

$N \cup \{P(a)\}$ unsat and

$N \cup \{P(b)\}$ unsat

Splitting

BS

$$C \vee P(x, a_1) \vee P(x, a_2)$$

$$\sigma_i := \{x \rightarrow a_1, \dots, a_n\}$$

$$C \sigma_i \vee P(a_i, a_1) \vee P(a_i, a_2)$$

Splitting

$$\begin{aligned}
 N &= \{ \\
 (1) \quad & \neg R(x, y) \vee \neg R(y, z) \vee R(x, z) && \text{\$ } S \\
 (2) \quad & \neg R(x, x) && \text{SUP} \\
 (3) \quad & \neg R(x, a) \vee R(x, b) && \text{+ selection} \\
 & \equiv \\
 & \bigvee (4) R(a, x) \vee R(b, x) \\
 & \Rightarrow_{\text{INST}} \{ N \cup \{R(a, a) \vee R(b, a)\}, N \cup \{R(a, b) \vee R(b, b)\} \} \\
 & \Rightarrow_{\text{SPLIT}} \{ \dots, N \cup \{R(a, a)\}, \dots, N \cup \{R(b, a)\}, N \cup \{R(a, b)\} \} \\
 & \quad \quad \quad \begin{array}{ccc}
 2.1 \text{ SUP BF } 7.1 = \perp & 3.1 \text{ } R(b, b) & 1.1 \text{ } \neg R(b, z) \vee R(a, z) \\
 & 2.1 \text{ } \perp & \text{sat}
 \end{array}
 \end{aligned}$$

Plan: Unit Equality

SCL (T)

BS + Arith