

$$F = \{A \rightarrow B, B \rightarrow C\}$$

$$F \stackrel{bc}{\models} A \rightarrow C$$

suy dẫn (imply)

$$\forall x(x) \text{ thỏa } F \Rightarrow \text{thỏa } A \rightarrow C$$

ag' F F A A C

AN < fel  
Török

gt  $\Rightarrow$  kl  
phải kl sai ( $\neg$  kl)

gt  $\Rightarrow$   $\Rightarrow$  mâu thuẫn gt  
 $\Rightarrow$  đg

$$F = \{ A \rightarrow BC, C \rightarrow D \}$$

$$F \models A \rightarrow D$$



1.e  $\{ \underline{A \rightarrow B}, \underline{e \rightarrow D} \} \models A \rightarrow D$

hence the  $\neg$

$\exists (t_1, t_2) : \underline{t_1 A = t_2 A}, \underline{t_1 D \neq t_2 D}$

•  $t_1 e \neq t_2 e \Rightarrow \underline{t_1 B \neq t_2 B}$   
 $\forall A \rightarrow B,$

•  $\underline{t_1 e = t_2 e}, \underline{t_1 D \neq t_2 D} \quad \forall e \rightarrow D$

tho... :  $A \rightarrow D$   $\blacksquare$

$$t. \text{top} \quad \{ A \rightarrow Bc, c \rightarrow D \} \vdash A \rightarrow D$$

$$\forall (t_1, t_2) \in \forall h(R) : t_1.A = t_2.A$$

$$\xRightarrow{A \rightarrow Bc} t_1.Bc = t_2.Bc \Rightarrow t_1.c = t_2.c$$

$$\xRightarrow{c \rightarrow D} t_1.D = t_2.D$$

$$\text{root } D \vdash A \rightarrow D \quad \blacksquare$$

a)  $X \rightarrow Y$  and  $Z \rightarrow W$  imply  $XZ \rightarrow YW$

$$\left. \begin{array}{l} X \rightarrow Y \\ Z \rightarrow W \end{array} \right\} \vdash XZ \rightarrow YW$$

$$X \rightarrow Y \quad \vdash^{\text{Axiom}} XZ \rightarrow YZ \quad (1)$$

$$Z \rightarrow W \quad \vdash^{\text{Axiom}} ZY \rightarrow WY \quad (2)$$

$$\left. \begin{array}{l} (1) \\ (2) \end{array} \right\} \vdash^{\text{Trans}} XZ \rightarrow YW \quad \blacksquare$$



1.  $\text{phn } \alpha$ :  $\gamma \subseteq \alpha \vdash^{\text{phn}} \alpha \rightarrow \gamma$

2. Tách:  $\alpha \rightarrow \gamma \vdash^{\text{tách}} \alpha \rightarrow \gamma$

3. bắc cầu:  $\left. \begin{array}{l} \alpha \rightarrow \gamma \\ \gamma \rightarrow \beta \end{array} \right\} \vdash^{\text{bắc}} \alpha \rightarrow \beta$



4.  $\{A\}$

$$\begin{array}{l} X \rightarrow Y \\ X \rightarrow Z \end{array} \Bigg\} \models^h X \rightarrow YZ$$

5.  $bc \text{ gr}$

$$\begin{array}{l} X \rightarrow Y \\ Y \textcolor{cyan}{W} \rightarrow Z \end{array} \Bigg\} \models^{bc} X \textcolor{cyan}{W} \rightarrow Z$$

6.  $fan \hat{e}$ :

$$X \rightarrow YZ \models^{fan} \begin{array}{l} X \rightarrow Y \\ X \rightarrow Z \end{array}$$