

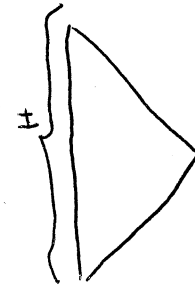
$$\begin{array}{c}
 \text{Q1} \\
 \hline
 \frac{\frac{\text{Inf}(0,1) \quad \text{Inf}(1,2)}{\text{Inf}(0,1) \wedge \text{Inf}(1,2)} \quad (\wedge I)}{\frac{(\text{Inf}(0,1) \wedge \text{Inf}(1,2)) \rightarrow \text{Inf}(0,2)}{(\text{Inf}(0,1) \wedge \text{Inf}(1,2)) \rightarrow \text{Inf}(0,2)} \quad (\rightarrow I)} \\
 \frac{\text{Inf}(0,2) \quad \text{Inf}(2,3)}{\text{Inf}(0,2) \wedge \text{Inf}(2,3)} \quad (\wedge I) \quad \frac{(\text{Inf}(0,2) \wedge \text{Inf}(2,3)) \rightarrow \text{Inf}(0,3)}{(\text{Inf}(0,2) \wedge \text{Inf}(2,3)) \rightarrow \text{Inf}(0,3)} \quad (\rightarrow I) \\
 \frac{\text{Inf}(0,2) \wedge \text{Inf}(2,3)}{\text{Inf}(0,3)} \quad (\wedge E)
 \end{array}$$

Q2 a. $H \vdash \text{Inf}(0,1)$ car $\text{Inf}(0,1) \in H$.

b. $H \vdash \boxed{H \vdash \text{Inf}(0,n)}$ et IFD: $\boxed{H \vdash \text{Inf}(0,n+1)}$

$H \vdash \text{Inf}(0,n) \Rightarrow$ il existe une preuve en D.U de

$\text{Inf}(0,n)$ sous les hyp. de H , de plus $\text{Inf}(n,n+1) \in H$



car $\text{Inf}(0,n) \wedge \text{Inf}(n,n+1) \rightarrow \text{Inf}(0,n+1)$

Preuve de
 $H \vdash \text{Inf}(0,n)$

Preuve de

$\vdash \text{Inf}(0,n+1)$

$$\begin{array}{c}
 \frac{\text{Inf}(0,n) \quad \text{Inf}(n,n+1)}{\text{Inf}(0,n) \wedge \text{Inf}(n,n+1)} \quad (\wedge I) \\
 \frac{\text{Inf}(0,n) \wedge \text{Inf}(n,n+1)}{\text{Inf}(0,n) \wedge \text{Inf}(n,n+1) \rightarrow \text{Inf}(0,n+1)} \quad (\rightarrow I) \\
 \text{Inf}(0,n+1)
 \end{array}$$

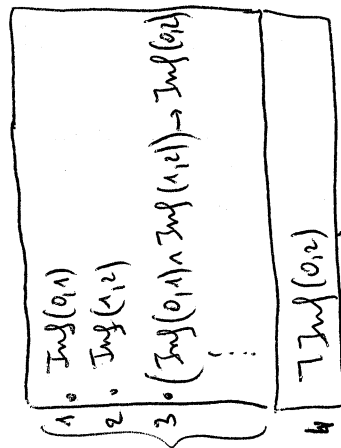
85

$$\begin{array}{l} \text{a. } r \rightarrow (p \rightarrow q) \\ \frac{\frac{r \wedge p}{\quad} E_1}{\quad} \wedge E \\ \frac{\quad}{r} \wedge E \\ \frac{\quad}{p \rightarrow q} \rightarrow I \end{array}$$
$$\frac{\sigma}{\Gamma \rightarrow (\nu)} \quad \sigma$$
$$v(\text{Inf}(i,j)) = 1 = v(\text{Inf}(j,k)) \text{ et } v(\text{Inf}(i,k)) = 0$$

ف

51

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9:3

$$\begin{array}{r} 5.7 \text{ Inf}(0,1) \wedge \text{Inf}(4,2) \\ 7.5 \text{ Inf}(0,2) \\ 7.5 \text{ Inf}(4,6) \end{array}$$
 6.7 Jmol^{-1}
$$\mathbf{I}(1, 6) \quad \mathbf{I}(2, 2)$$

Tableau fermé.

X

~~(4)~~ par l'absurde

6

~~Patr~~ ~~En~~

$$\frac{p \rightarrow (q \rightarrow r)}{p \rightarrow q} \text{E} \rightarrow$$
$$z_i \perp (y_i, z_i)$$
 6.7 Jmol^{-1}
$$\mathbf{I}(1, 6) \quad \mathbf{I}(2, 2)$$

Tableau fermé.

X

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$$\begin{array}{l}
 \frac{\frac{p \wedge r}{p} \quad \frac{r \rightarrow s}{s}}{p \rightarrow (q \vee (r \rightarrow s))} \quad \text{①} \\
 \frac{p \rightarrow (q \vee (r \rightarrow s))}{q \vee (r \rightarrow s)} \\
 \frac{q \vee (r \rightarrow s) \quad q \vee s}{q \vee s} \quad \text{②} \\
 \frac{q \vee s \quad p \wedge r}{p \wedge r} \quad \text{③} \\
 \frac{p \wedge r \quad r \rightarrow s}{s} \quad \text{④} \\
 \frac{s \quad \bar{s} \vee (2,3)}{\bar{s} \vee (2,3)}
 \end{array}$$
$$e \quad \neg(pv(q \rightarrow r))$$

$$\frac{\neg q \quad q}{\bot} I_1$$

$$\frac{\bot}{r} E_1$$

$$\frac{r}{q \rightarrow r} I_2$$

$$\frac{q \rightarrow r}{pv(q \rightarrow r)} I_3$$

$$\frac{pv(q \rightarrow r)}{\bot} I_4$$

Il faut montrer que:

$$a_1, \dots, a_i \vdash \exists x (A_x \wedge \neg B_x)$$

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$$\begin{array}{l}
 \text{a. } I(\text{Ana}) \wedge A(\text{Ana}, \text{Bob}) \\
 \text{b. } \exists x. (M(x) \wedge A(\text{Ana}, x)) \\
 \text{c. } \forall x. (M(x) \rightarrow \neg A(\text{Bob}, x)) \wedge A(\text{Bob}, \text{Bob}) \\
 \text{d. } \forall x. (M(x) \vee I(x)) \\
 \text{e. } \forall x. (M(x) \rightarrow \exists y. (I(y) \wedge A(x, y) \wedge x \neq y)) \\
 \text{f. } \exists x. (I(x) \wedge \forall y. (M(y) \rightarrow A(x, y))) \\
 \text{g. } \forall x. ((I(x) \wedge \exists y. (M(y) \wedge A(x, y))) \rightarrow M(x)) \\
 \text{h. } \forall x. ((M(x) \wedge \exists y. (M(y) \wedge \exists z. (I(z) \wedge A(y, z)) \wedge A(x, y))) \\
 \quad \rightarrow \forall z. (I(z) \rightarrow A(x, z))) \\
 \text{i. } \forall x. ((I(x) \rightarrow R(x)) \wedge (Mx \rightarrow \neg R(x))) \\
 \end{array}$$