

# SIMULAZIONE 7-gen 2015

$$\begin{array}{c}
 \text{ax-id} \\
 \hline
 A \vdash A \\
 \hline
 A \rightarrow B, A \vdash A \quad \text{insx} \\
 \hline
 A \rightarrow B, B \& A \vdash A \quad \&-re_2 \\
 \hline
 A \rightarrow B \vdash B \& A \rightarrow A \quad \rightarrow -f \\
 \hline
 A \rightarrow B \vdash \neg(B \& A \rightarrow A) \quad \neg-re \\
 \hline
 A \rightarrow B, \neg(B \& A \rightarrow A) \vdash \quad \neg-f \\
 \hline
 A \rightarrow B \vdash \neg\neg(B \& A \rightarrow A)
 \end{array}$$

$$\begin{array}{c}
 \text{ax-id} \\
 \hline
 C(z) \vdash C(z) \quad \neg-re \\
 \hline
 \neg C(z), C(z) \vdash \quad \forall-re \\
 \hline
 \neg C(z), \forall y C(y) \vdash \quad \neg-f \\
 \hline
 \neg C(z) \vdash \neg \forall y C(y) \\
 \hline
 \neg C(z) \vdash \neg \forall y C(y) \vee \exists w C(w) \quad \forall-re_1 \\
 \hline
 \neg C(z) \vdash \neg \forall y C(y) \vee \exists w C(w) \quad \exists-f \\
 \hline
 \exists x \neg C(x) \vdash \neg \forall y C(y) \vee \exists w C(w) \quad \text{z nuova in}
 \end{array}$$

$$\begin{array}{c}
\text{ax-id} \\
\frac{C(z_1, y_1) \vdash C(z_1, y_1)}{C(z_1, y_1) \vdash C(z_1, y_1) \vee C(y_1, z_1)} \vee\text{-re}_1 \\
\frac{C(z_1, y_1) \vdash C(z_1, y_1) \vee C(y_1, z_1)}{C(z_1, y_1) \vdash \exists w (C(z_1, w) \vee C(w, z_1))} \exists\text{-re} \\
\frac{C(z_1, y_1) \vdash \exists w (C(z_1, w) \vee C(w, z_1))}{\exists y C(z_1, y) \vdash \exists w (C(z_1, w) \vee C(w, z_1))} \exists\text{-f } y, \text{ move in} \\
\frac{\exists y C(z_1, y) \vdash \exists w (C(z_1, w) \vee C(w, z_1))}{\forall x \exists y C(x, y) \vdash \exists w (C(z_1, w) \vee C(w, z_1))} \forall\text{-re} \\
\frac{\forall x \exists y C(x, y) \vdash \exists w (C(z_1, w) \vee C(w, z_1))}{\forall x \exists y C(x, y) \vdash \forall z \exists w (C(z, w) \vee C(w, z))} \forall\text{-f } z, \text{ move in}
\end{array}$$

$$\begin{array}{c}
\text{ax-id} \quad \text{ax-}\perp \\
\frac{\neg C(w) \vdash \neg C(w) \quad \perp \vdash}{\neg C(w) \rightarrow \perp, \neg C(w) \vdash} \rightarrow\text{-re} \\
\frac{\neg C(w) \rightarrow \perp, \neg C(w) \vdash}{\neg C(w) \rightarrow \perp, \forall x \neg C(x) \vdash} \forall\text{-re} \\
\frac{\neg C(w) \rightarrow \perp, \forall x \neg C(x) \vdash}{\exists x (\neg C(x) \rightarrow \perp), \forall x \neg C(x) \vdash} \exists\text{-f } w, \text{ move in} \\
\frac{\exists x (\neg C(x) \rightarrow \perp), \forall x \neg C(x) \vdash}{\exists x (\neg C(x) \rightarrow \perp) \vdash \neg \forall x \neg C(x)} \neg\text{f}
\end{array}$$