

$$\begin{array}{c}
\frac{}{x \vdash x} \text{init}_{mu} \quad \frac{}{\text{false}, x \vdash \text{false}} \text{false} \quad \frac{}{y \vdash \text{true}} \text{true} \quad \frac{}{y \vdash x} \text{mu}_r \quad \frac{}{y, \text{false} \vdash y} \text{false} \quad \frac{}{z \vdash \text{true}} \text{true} \quad \frac{}{z \vdash x} \text{mu}_r \quad \frac{}{z, \text{false} \vdash} \\
\frac{}{(x \rightarrow \text{false}), x \vdash \text{false}} \text{imp}_l \quad \frac{}{y, (x \rightarrow \text{false}) \vdash y} \text{imp}_l \quad \frac{}{z, (x \rightarrow \text{false}) \vdash y} \\
\frac{}{(x \rightarrow \text{false}) \vdash (x \rightarrow \text{false})} \text{imp}_r \quad \frac{}{(y \vee z), (x \rightarrow \text{false}) \vdash y} \text{imp}_l \\
\frac{}{((x \rightarrow \text{false}) \rightarrow (y \vee z)), (x \rightarrow \text{false}) \vdash y} \text{imp}_r \\
\frac{}{((x \rightarrow \text{false}) \rightarrow (y \vee z)) \vdash ((x \rightarrow \text{false}) \rightarrow y)} \text{left} \\
\frac{}{((x \rightarrow \text{false}) \rightarrow (y \vee z)) \vdash (((x \rightarrow \text{false}) \rightarrow y) \vee ((x \rightarrow \text{false}) \rightarrow z))} \text{left} \\
\vdash (((x \rightarrow \text{false}) \rightarrow (y \vee z)) \rightarrow (((x \rightarrow \text{false}) \rightarrow y) \vee ((x \rightarrow \text{false}) \rightarrow z))) \text{imp}_r
\end{array}$$