

$$\begin{array}{c}
\frac{}{\vdash \textcolor{red}{p}^\perp \Downarrow [\cdot][\cdot]p; \cdot} \mathbf{I} \\
\frac{}{\vdash [\cdot][\cdot]p^\perp; p} * \quad \frac{}{\vdash \textcolor{red}{1} \Downarrow [\cdot][\cdot]; \cdot} \mathbf{1} \\
\hline
\vdash \textcolor{red}{p} \otimes \textcolor{red}{1} \Downarrow [\cdot][\cdot]p^\perp; \cdot \quad \otimes \\
\frac{}{\vdash \textcolor{red}{p} \otimes \textcolor{red}{1} \oplus \textcolor{red}{q} \Downarrow [\cdot][\cdot]p^\perp; \cdot} \oplus \\
\frac{}{\vdash [\cdot][1 : p \otimes \textcolor{red}{1} \oplus q]p^\perp; \cdot} \mathbf{T} \\
\hline
\vdash [\cdot][1 : p \otimes \textcolor{red}{1} \oplus q]; \cdot //^1 \vdash [\cdot][\cdot]p^\perp; \cdot \quad 4 \\
\hline
\vdash [\cdot][1 : p \otimes \textcolor{red}{1} \oplus q]; \cdot //^1 \vdash [\cdot][\cdot]; p^\perp \quad * \\
\hline
\vdash \textcolor{red}{!}^1 p^\perp \Downarrow [\cdot][1 : p \otimes \textcolor{red}{1} \oplus q]; \cdot \quad ! \\
\hline
\vdash [\cdot][\cdot]; ?^1 p \otimes \textcolor{red}{1} \oplus q, \textcolor{red}{!}^1 p^\perp \quad *
\end{array}$$