

weak-antecedent-surjection-conditional^{11,40}

$$\begin{aligned}
& \forall es:\mathbb{E}\mathbb{S}, P_1, Q_1, P_2, Q_2:(\mathbb{E} \rightarrow \mathbb{P}), dcd_P_1:(e:\mathbb{E} \rightarrow \text{Dec}(P_1(e))), f:(\{e:\mathbb{E} \mid P_1(e)\} \rightarrow \{e:\mathbb{E} \mid Q_1(e)\}), \\
& \quad g:(\{e:\mathbb{E} \mid P_2(e)\} \rightarrow \{e:\mathbb{E} \mid Q_2(e)\}). \\
& (\forall e:\mathbb{E}. (P_1(e) \Rightarrow (\neg(P_2(e)))) \\
& \Rightarrow (\forall e:\mathbb{E}. \text{Dec}(Q_1(e))) \\
& \Rightarrow (\forall e:\mathbb{E}. \text{Dec}(Q_2(e))) \\
& \Rightarrow Q_1 \leftarrow \leftarrow = f == P_1 \\
& \Rightarrow Q_2 \leftarrow \leftarrow = g == P_2 \\
& \Rightarrow \lambda e.(Q_1(e) \vee (Q_2(e)) \leftarrow \leftarrow = [P_1? f : g] == \lambda e.(P_1(e) \vee (P_2(e)))
\end{aligned}$$