- $1. \ \vdash \Big( \{Q \supset [(R \land T) \lor (S \lor L)] \} \supset \{ [(T \land M) \supset (R \supset M)] \lor [(Q \land Q) \supset (Q \land S)] \} \Big) \lor \{ [(Z \lor R) \lor (Y \land P)] \lor \neg W \}$
- $2. \ \vdash \neg \Big[ \neg \Big( \{Q \supset [(R \land T) \lor (S \lor L)] \} \supset \{ [(T \land M) \supset (R \supset M)] \lor [(Q \land Q) \supset (Q \land S)] \} \Big) \land \neg \{ [(Z \lor R) \lor (Y \land P)] \lor \neg W \} \Big]$
- $3. \ \neg \Big( \{Q \supset [(R \land T) \lor (S \lor L)] \} \supset \{ [(T \land M) \supset (R \supset M)] \lor [(Q \land Q) \supset (Q \land S)] \} \Big) \land \neg \{ [(Z \lor R) \lor (Y \land P)] \lor \neg W \} \vdash Q \\ \neg \Big( \{Q \supset [(R \land T) \lor (S \lor L)] \} \supset \{ [(T \land M) \supset (R \supset M)] \lor [(Q \land Q) \supset (Q \land S)] \} \Big) \land \neg \{ [(Z \lor R) \lor (Y \land P)] \lor \neg W \} \vdash \neg Q \\ \neg \Big( \{Q \supset [(R \land T) \lor (S \lor L)] \} \supset \{ [(T \land M) \supset (R \supset M)] \lor [(Q \land Q) \supset (Q \land S)] \} \Big) \land \neg \{ [(Z \lor R) \lor (Y \land P)] \lor \neg W \} \vdash \neg Q \\ \neg \{ (Q \supset [(R \land T) \lor (S \lor L)] \} \supset \{ (Q \land Q) \supset (Q \land S) \} \} \Big) \land \neg \{ (Q \supset (Q \land S)) \} \Big) \land \neg \{ (Q \supset (Q \land S)) \} \\ \neg \{ (Q \supset (Q \land S)) \} \supset \{ (Q \land Q) \supset (Q \land S) \} \} \\ \neg \{ (Q \supset (Q \land S)) \} \supset \{ (Q \land Q) \supset (Q \land S) \} \} \\ \neg \{ (Q \supset (Q \land S)) \} \supset \{ (Q \land Q) \supset (Q \land S) \} \} \\ \neg \{ (Q \supset (Q \land S)) \} \supset \{ (Q \land Q) \supset (Q \land S) \} \} \\ \neg \{ (Q \supset (Q \land S)) \} \supset \{ (Q \land Q) \supset (Q \land S) \} \} \\ \neg \{ (Q \supset (Q \land S)) \} \supset \{ (Q \land Q) \supset (Q \land S) \} \} \\ \neg \{ (Q \supset (Q \land S)) \} \supset \{ (Q \land Q) \supset (Q \land S) \} \} \\ \neg \{ (Q \supset (Q \land S)) \} \supset \{ (Q \land Q) \supset (Q \land S) \} \} \\ \neg \{ (Q \supset (Q \land S)) \} \supset \{ (Q \land Q) \supset (Q \land S) \} \} \\ \neg \{ (Q \supset (Q \land S)) \} \supset \{ (Q \land Q) \supset (Q \land S) \} \} \\ \neg \{ (Q \supset (Q \land S)) \} \supset \{ (Q \land Q) \supset (Q \land S) \} \} \\ \neg \{ (Q \supset (Q \land S)) \} \supset \{ (Q \land Q) \supset (Q \land S) \} \} \\ \neg \{ (Q \supset (Q \land S)) \} \supset \{ (Q \land Q) \supset (Q \land S) \} \} \\ \neg \{ (Q \supset (Q \land S)) \} \supset \{ (Q \land Q) \supset (Q \land S) \} \} \\ \neg \{ (Q \supset (Q \land S)) \} \supset \{ (Q \land Q) \supset (Q \land S) \} \} \\ \neg \{ (Q \supset (Q \land S)) \} \supset \{ (Q \land Q) \supset (Q \land S) \} \} \\ \neg \{ (Q \supset (Q \land S)) \}$
- $4. \ \neg \Big( \{Q \supset [(R \land T) \lor (S \lor L)]\} \supset \{ [(T \land M) \supset (R \supset M)] \lor [(Q \land Q) \supset (Q \land S)]\} \Big), \neg \{ [(Z \lor R) \lor (Y \land P)] \lor \neg W\} \vdash Q \\ \neg \Big( \{Q \supset [(R \land T) \lor (S \lor L)]\} \supset \{ [(T \land M) \supset (R \supset M)] \lor [(Q \land Q) \supset (Q \land S)]\} \Big), \neg \{ [(Z \lor R) \lor (Y \land P)] \lor \neg W\} \vdash \neg Q \Big\}$
- $5. \ \ Q\supset [(R\land T)\lor (S\lor L)], \neg \{[(T\land M)\supset (R\supset M)]\lor [(Q\land Q)\supset (Q\land S)]\}, \neg \{[(Z\lor R)\lor (Y\land P)]\lor \neg W\}\vdash Q$   $Q\supset [(R\land T)\lor (S\lor L)], \neg \{[(T\land M)\supset (R\supset M)]\lor [(Q\land Q)\supset (Q\land S)]\}, \neg \{[(Z\lor R)\lor (Y\land P)]\lor \neg W\}\vdash \neg Q$
- $\begin{aligned} 6. \ \, \neg Q, \neg \{[(T \land M) \supset (R \supset M)] \lor [(Q \land Q) \supset (Q \land S)]\}, \neg \{[(Z \lor R) \lor (Y \land P)] \lor \neg W\} \vdash Q \\ (R \land T) \lor (S \lor L), \neg \{[(T \land M) \supset (R \supset M)] \lor [(Q \land Q) \supset (Q \land S)]\}, \neg \{[(Z \lor R) \lor (Y \land P)] \lor \neg W\} \vdash Q \\ \neg Q, \neg \{[(T \land M) \supset (R \supset M)] \lor [(Q \land Q) \supset (Q \land S)]\}, \neg \{[(Z \lor R) \lor (Y \land P)] \lor \neg W\} \vdash \neg Q \\ (R \land T) \lor (S \lor L), \neg \{[(T \land M) \supset (R \supset M)] \lor [(Q \land Q) \supset (Q \land S)]\}, \neg \{[(Z \lor R) \lor (Y \land P)] \lor \neg W\} \vdash \neg Q \end{aligned}$
- $7. \ \neg Q, \neg [(T \land M) \supset (R \supset M)], \neg [(Q \land Q) \supset (Q \land S)], \neg \{[(Z \lor R) \lor (Y \land P)] \lor \neg W\} \vdash Q \\ R \land T, \neg \{[(T \land M) \supset (R \supset M)] \lor [(Q \land Q) \supset (Q \land S)]\}, \neg \{[(Z \lor R) \lor (Y \land P)] \lor \neg W\} \vdash Q \\ S \lor L, \neg \{[(T \land M) \supset (R \supset M)] \lor [(Q \land Q) \supset (Q \land S)]\}, \neg \{[(Z \lor R) \lor (Y \land P)] \lor \neg W\} \vdash Q \\ \neg Q \vdash \neg Q \\ R \land T, \neg \{[(T \land M) \supset (R \supset M)] \lor [(Q \land Q) \supset (Q \land S)]\}, \neg \{[(Z \lor R) \lor (Y \land P)] \lor \neg W\} \vdash \neg Q \\ S \lor L, \neg \{[(T \land M) \supset (R \supset M)] \lor [(Q \land Q) \supset (Q \land S)]\}, \neg \{[(Z \lor R) \lor (Y \land P)] \lor \neg W\} \vdash \neg Q \\ S \lor L, \neg \{[(T \land M) \supset (R \supset M)] \lor [(Q \land Q) \supset (Q \land S)]\}, \neg \{[(Z \lor R) \lor (Y \land P)] \lor \neg W\} \vdash \neg Q \\ S \lor L, \neg \{[(T \land M) \supset (R \supset M)] \lor [(Q \land Q) \supset (Q \land S)]\}, \neg \{[(Z \lor R) \lor (Y \land P)] \lor \neg W\} \vdash \neg Q \\ S \lor L, \neg \{[(T \land M) \supset (R \supset M)] \lor [(Q \land Q) \supset (Q \land S)]\}, \neg \{[(Z \lor R) \lor (Y \land P)] \lor \neg W\} \vdash \neg Q \\ S \lor L, \neg \{[(T \land M) \supset (R \supset M)] \lor [(Q \land Q) \supset (Q \land S)]\}, \neg \{[(Z \lor R) \lor (Y \land P)] \lor \neg W\} \vdash \neg Q \\ S \lor L, \neg \{[(T \land M) \supset (R \supset M)] \lor [(Q \land Q) \supset (Q \land S)]\}, \neg \{[(Z \lor R) \lor (Y \land P)] \lor \neg W\} \vdash \neg Q \\ S \lor L, \neg \{[(T \land M) \supset (R \supset M)] \lor [(Q \land Q) \supset (Q \land S)]\}, \neg \{[(Z \lor R) \lor (Y \land P)] \lor \neg W\} \vdash \neg Q \\ S \lor L, \neg \{[(T \land M) \supset (R \supset M)] \lor [(Q \land Q) \supset (Q \land S)]\}, \neg \{[(Z \lor R) \lor (Y \land P)] \lor \neg W\} \vdash \neg Q \\ S \lor L, \neg \{[(T \land M) \supset (R \supset M)] \lor [(Q \land Q) \supset (Q \land S)]\}, \neg \{[(Z \lor R) \lor (Y \land P)] \lor \neg W\} \vdash \neg Q \\ S \lor L, \neg \{[(T \land M) \supset (R \supset M)] \lor [(Q \land Q) \supset (Q \land S)]\}, \neg \{[(Z \lor R) \lor (Y \land P)] \lor \neg W\} \vdash \neg Q \\ S \lor L, \neg \{[(T \land M) \supset (R \supset M)] \lor [(Q \land Q) \supset (Q \land S)]\}, \neg \{[(Z \lor R) \lor (Y \land P)] \lor \neg W\} \vdash \neg Q \\ S \lor L, \neg \{[(T \land M) \supset (R \supset M)] \lor [(Q \land Q) \supset (Q \land S)]\}, \neg \{[(Z \lor R) \lor (Y \land P)] \lor \neg W\} \vdash \neg Q \\ S \lor L, \neg \{[(T \land M) \supset (R \supset M)] \lor [(Q \land Q) \supset (Q \land S)]\}, \neg \{[(Z \lor R) \lor (Y \land P)] \lor \neg W\} \vdash \neg Q \\ S \lor L, \neg \{[(Z \lor R) \lor (Y \land P)] \lor (Y \land P)], \neg W \vdash \neg Q \\ S \lor L, \neg \{[(Z \lor R) \lor (Y \land P)] \lor (Y \land P)], \neg W \vdash \neg Q \\ S \lor L, \neg \{[(Z \lor R) \lor (Y \land P)] \lor (Y \land P)], \neg W \vdash \neg Q \\ S \lor L, \neg \{[(Z \lor R) \lor (Y \land P)] \lor (Y \land P)], \neg W \vdash \neg Q \\ S \lor L, \neg \{[(Z \lor R) \lor (Y \land P)] \lor (Y \land P)], \neg W \vdash \neg Q \\ S \lor L, \neg \{[(Z \lor R) \lor (Y \land P)] \lor (Y \land P)], \neg W \vdash \neg Q \\ S \lor L, \neg \{[(Z \lor R) \lor (Y \land P)] \lor (Y \land P)], \neg W \vdash \neg Q \\ S \lor L, \neg \{[(Z \lor R) \lor (Y \land P)] \lor (Y \land P)], \neg W \vdash \neg Q \\ S \lor L, \neg \{[(Z \lor R) \lor (Y \land P)] \lor (Y \land P)$
- $8. \ \neg Q, T \land M, \neg (R \supset M), \neg [(Q \land Q) \supset (Q \land S)], \neg \{[(Z \lor R) \lor (Y \land P)] \lor \neg W\} \vdash Q$   $R \land T, \neg [(T \land M) \supset (R \supset M)], \neg [(Q \land Q) \supset (Q \land S)], \neg \{[(Z \lor R) \lor (Y \land P)] \lor \neg W\} \vdash Q$   $S, \neg \{[(T \land M) \supset (R \supset M)] \lor [(Q \land Q) \supset (Q \land S)]\}, \neg \{[(Z \lor R) \lor (Y \land P)] \lor \neg W\} \vdash Q$   $L, \neg \{[(T \land M) \supset (R \supset M)] \lor [(Q \land Q) \supset (Q \land S)]\}, \neg \{[(Z \lor R) \lor (Y \land P)] \lor \neg W\} \vdash Q$   $\neg Q \vdash \neg Q$   $R \land T, \neg [(T \land M) \supset (R \supset M)], \neg [(Q \land Q) \supset (Q \land S)], \neg \{[(Z \lor R) \lor (Y \land P)] \lor \neg W\} \vdash \neg Q$   $S, \neg \{[(T \land M) \supset (R \supset M)] \lor [(Q \land Q) \supset (Q \land S)]\}, \neg \{[(Z \lor R) \lor (Y \land P)] \lor \neg W\} \vdash \neg Q$   $L, \neg \{[(T \land M) \supset (R \supset M)] \lor [(Q \land Q) \supset (Q \land S)]\}, \neg \{[(Z \lor R) \lor (Y \land P)] \lor \neg W\} \vdash \neg Q$
- $9. \ \neg Q, T \land M, R, \neg M, \neg [(Q \land Q) \supset (Q \land S)], \neg \{[(Z \lor R) \lor (Y \land P)] \lor \neg W\} \vdash Q$   $R \land T, T \land M, \neg (R \supset M), \neg [(Q \land Q) \supset (Q \land S)], \neg \{[(Z \lor R) \lor (Y \land P)] \lor \neg W\} \vdash Q$   $S, \neg [(T \land M) \supset (R \supset M)], \neg [(Q \land Q) \supset (Q \land S)], \neg \{[(Z \lor R) \lor (Y \land P)] \lor \neg W\} \vdash Q$   $L, \neg [(T \land M) \supset (R \supset M)], \neg [(Q \land Q) \supset (Q \land S)], \neg \{[(Z \lor R) \lor (Y \land P)] \lor \neg W\} \vdash Q$   $\neg Q \vdash \neg Q$   $R \land T, T \land M, \neg (R \supset M), \neg [(Q \land Q) \supset (Q \land S)], \neg \{[(Z \lor R) \lor (Y \land P)] \lor \neg W\} \vdash \neg Q$   $S, \neg [(T \land M) \supset (R \supset M)], \neg [(Q \land Q) \supset (Q \land S)], \neg \{[(Z \lor R) \lor (Y \land P)] \lor \neg W\} \vdash \neg Q$   $L, \neg [(T \land M) \supset (R \supset M)], \neg [(Q \land Q) \supset (Q \land S)], \neg \{[(Z \lor R) \lor (Y \land P)] \lor \neg W\} \vdash \neg Q$
- $\begin{aligned} &10. \ \, \neg Q, T \wedge M, R, \neg M, Q \wedge Q, \neg (Q \wedge S), \neg \{[(Z \vee R) \vee (Y \wedge P)] \vee \neg W\} \vdash Q \\ &R \wedge T, T \wedge M, R, \neg M, \neg [(Q \wedge Q) \supset (Q \wedge S)], \neg \{[(Z \vee R) \vee (Y \wedge P)] \vee \neg W\} \vdash Q \\ &S, T \wedge M, \neg (R \supset M), \neg [(Q \wedge Q) \supset (Q \wedge S)], \neg \{[(Z \vee R) \vee (Y \wedge P)] \vee \neg W\} \vdash Q \\ &L, T \wedge M, \neg (R \supset M), \neg [(Q \wedge Q) \supset (Q \wedge S)], \neg \{[(Z \vee R) \vee (Y \wedge P)] \vee \neg W\} \vdash Q \\ &\neg Q \vdash \neg Q \\ &R \wedge T, T \wedge M, R, \neg M, \neg [(Q \wedge Q) \supset (Q \wedge S)], \neg \{[(Z \vee R) \vee (Y \wedge P)] \vee \neg W\} \vdash \neg Q \\ &S, T \wedge M, \neg (R \supset M), \neg [(Q \wedge Q) \supset (Q \wedge S)], \neg \{[(Z \vee R) \vee (Y \wedge P)] \vee \neg W\} \vdash \neg Q \\ &L, T \wedge M, \neg (R \supset M), \neg [(Q \wedge Q) \supset (Q \wedge S)], \neg \{[(Z \vee R) \vee (Y \wedge P)] \vee \neg W\} \vdash \neg Q \end{aligned}$
- $\begin{aligned} &11. \ \, \neg Q, T \wedge M, R, \neg M, Q \wedge Q, \neg (Q \wedge S), \neg [(Z \vee R) \vee (Y \wedge P)], \neg \neg W \vdash Q \\ &R \wedge T, T \wedge M, R, \neg M, Q \wedge Q, \neg (Q \wedge S), \neg \{[(Z \vee R) \vee (Y \wedge P)] \vee \neg W\} \vdash Q \\ &S, T \wedge M, R, \neg M, \neg [(Q \wedge Q) \supset (Q \wedge S)], \neg \{[(Z \vee R) \vee (Y \wedge P)] \vee \neg W\} \vdash Q \\ &L, T \wedge M, R, \neg M, \neg [(Q \wedge Q) \supset (Q \wedge S)], \neg \{[(Z \vee R) \vee (Y \wedge P)] \vee \neg W\} \vdash Q \\ &\neg Q \vdash \neg Q \\ &R \wedge T, T \wedge M, R, \neg M, Q \wedge Q, \neg (Q \wedge S), \neg \{[(Z \vee R) \vee (Y \wedge P)] \vee \neg W\} \vdash \neg Q \\ &S, T \wedge M, R, \neg M, \neg [(Q \wedge Q) \supset (Q \wedge S)], \neg \{[(Z \vee R) \vee (Y \wedge P)] \vee \neg W\} \vdash \neg Q \\ &L, T \wedge M, R, \neg M, \neg [(Q \wedge Q) \supset (Q \wedge S)], \neg \{[(Z \vee R) \vee (Y \wedge P)] \vee \neg W\} \vdash \neg Q \end{aligned}$