

Law of Inference	Schemata
1. Law of Detachment	$\begin{array}{l} p \rightarrow q \\ \underline{p} \\ \hline \therefore q \end{array}$
2. Law of the Contrapositive	$\begin{array}{l} \underline{p \rightarrow q} \\ \hline \therefore \sim q \rightarrow \sim p \end{array}$
3. Law of <i>Modus Tollens</i>	$\begin{array}{l} p \rightarrow q \\ \underline{\sim q} \\ \hline \therefore \sim p \end{array}$
4. Chain Rule (Law of the Syllogism)	$\begin{array}{l} p \rightarrow q \\ \underline{q \rightarrow r} \\ \hline \therefore p \rightarrow r \end{array}$
5. Law of Disjunctive Inference	$\begin{array}{l} p \vee q \\ \underline{\sim p} \\ \hline \therefore q \end{array} \qquad \begin{array}{l} p \vee q \\ \underline{\sim q} \\ \hline \therefore p \end{array}$
6. Law of the Double Negation	$\begin{array}{l} \underline{\sim(\sim p)} \\ \hline \therefore p \end{array}$
7. De Morgan's Law	$\begin{array}{l} \underline{\sim(p \wedge q)} \\ \hline \therefore \sim p \vee \sim q \end{array} \qquad \begin{array}{l} \underline{\sim(p \vee q)} \\ \hline \therefore \sim p \wedge \sim q \end{array}$
8. Law of Simplification	$\begin{array}{l} \underline{p \wedge q} \\ \hline \therefore p \end{array} \qquad \begin{array}{l} \underline{\sim(p \vee q)} \\ \hline \therefore q \end{array}$
9. Law of Conjunction	$\begin{array}{l} p \\ \underline{q} \\ \hline \therefore p \wedge q \end{array}$
10. Law of Disjunctive Addition	$\begin{array}{l} \underline{p} \\ \hline \therefore p \vee q \end{array}$
11. Law of Conjunctive Argument	$\begin{array}{l} \sim(p \wedge q) \\ \underline{p} \\ \hline \therefore \sim q \end{array} \qquad \begin{array}{l} \sim(p \wedge q) \\ \underline{q} \\ \hline \therefore \sim p \end{array}$

Table 3.8 Some Rules of Inference for Propositional Logic