

Reit

= Elim, =Intro

\wedge Elim, \wedge Intro p.145

\vee Elim p.151 (Proof by Cases), Last sentence in both cases must be the same.

\vee intro p.149

$P \rightarrow Q$ (conditional) If P, then Q.

\rightarrow Elim p.207 1. $P \rightarrow Q$, 2. P, then can conclude Q.

\rightarrow Intro p.207 by having a subproof that starts with P and end with Q, then outside of subproof can state $P \rightarrow Q$.

\leftrightarrow biconditional ... if and only if necessary and sufficient

\leftrightarrow Elim, 1. $P \leftrightarrow Q$, 2. P... can conclude Q, or 1. $P \leftrightarrow Q$, 2. Q... can conclude P,

\leftrightarrow Intro to conclude the sentence $P \leftrightarrow Q$: two subproofs ($P \rightarrow Q$) and ($Q \rightarrow P$)

When your conclusion is a disjunction: $P \vee Q$. Use a Law of Excluded Middle. $P \vee \sim P$ (Taut Con)

\perp Elim p.161

\perp Intro p.157

\neg Elim p.156, \neg -Intro p. 157

Contrapositive: $P \rightarrow Q$ is tautologically equivalent to $\sim Q \rightarrow \sim P$