

## Derivation Rules

<b>Negation (<math>\sim</math>)</b>	Intro	i M. P i N. Q & $\sim$ Q ! N+1 $\sim$ P M-N $\sim$ I
	Elim	M. $\sim$ P N. P M $\sim$ E
<b>Conjunction (&amp;)</b>	Intro	L. P M. Q N. P & Q (or Q & P) L,M &I
	Elim	M. P & Q N. P (or Q) M &E
<b>Disjunction (<math>\vee</math>)</b>	Intro	M. P N. P $\vee$ Q (or Q $\vee$ P) M $\vee$ I
	Elim	K. P $\vee$ Q i L. P Ai i M. R - j M+1. Q Aj j N. R ! N+1. R K, L-M, M+1-N, $\vee$ D
<b>Conditional (<math>\supset</math>)</b>	Intro	i M. P Ai i N. Q - ! N+1 P $\supset$ Q M-N $\supset$ I
	Elim	L. P $\supset$ Q M. P N. Q L,M $\supset$ E
<b>Biconditional (<math>\equiv</math>)</b>	Intro	i L. P Ai i M. Q - j M+1. Q Aj j N. P - ! N+1. P $\equiv$ Q L-M, M+1-N, $\equiv$ I
	Elim	M. P $\equiv$ Q N. (P $\supset$ Q) & (Q $\supset$ P) M $\equiv$ E

### Reiteration

	i...k	M. P	
	i...k, l...n	N. Q	
	i...k, l...n	N+1. P	M, R

## Proper Derivation Format

Assumptions in force:	Line Number:	Sentence of SL:	Justification:	Notes:
	1	$P \supset Q$	Premise	Derive: $\sim Q \supset \sim P$
1	2	$\sim Q$	Assumption 1	for $\supset$ I Target: $\sim P$
2 1	3	$P$	Assumption 2	for $\sim$ I
2 1	4	$Q$	1,3 $\supset$ E	
2 1	5	$Q \& \sim Q$	2,4 $\&$ I	contradiction
! 1	6	$\sim P$	3-5 $\sim$ I	
!	7	$\sim Q \supset \sim P$	2-6 $\supset$ I	QED