Rules of Inference

Name of the Rule	Rule of Inference	Corresponding Tautology
Addition	$\frac{p}{\therefore p \vee q}$	$p \to (p \vee q)$
Simplification	$\frac{p \wedge q}{\therefore p}$	$p \wedge q \to p$
Conjunction	$\frac{p}{q}$ $\therefore p \wedge q$	$p \wedge q \to p \wedge q$
Modus ponens	$\frac{p}{p \to q}$ $\therefore q$	$(p \wedge (p \to q)) \to q$
Modus tollens	$\frac{\neg q}{p \to q}$ $\therefore \neg p$	$(\neg q) \wedge (p \to q) \to \neg p$
Hypothetical syllogism	$\frac{p \to q}{q \to r}$ $\therefore p \to r$	$((p \to q) \wedge (q \to r)) \to (p \to r)$
Disjunctive syllogism	$\frac{p \vee q}{\neg q}$ $\therefore p$	$((p \vee q) \wedge (\neg q)) \to p$
Resolution	$\frac{p \vee q}{\neg p \vee r}$ $\therefore q \vee r$	$((p \vee q) \wedge (\neg p \vee r)) \to (q \vee r)$

recall
$p \to q$
$\equiv \neg q \to \neg p$