1.4. Rules of Proof

(i) Rule of Replacement.

Any term in a logical formula may be replaced be an equivalent term.

For instance, if $q \equiv r$, then $p \wedge q \equiv p \wedge r$ Rep(q:r).

(ii) Rule of Substitution.

A sentence which is obtained by substituting logical propositions for the terms of a theorem is itself a theorem.

For instance, $(p \rightarrow q) \vee w \equiv w \vee (p \rightarrow q)$ Sub(p: $p \rightarrow q$), Theorem $p \vee w \equiv w \vee p$.

(iii) Rule of Inference.

$\dfrac{p \quad p \rightarrow q}{\therefore q}$	$\dfrac{\sim q \quad p \rightarrow q}{\therefore \sim p}$
$\dfrac{p \rightarrow q \quad q \rightarrow r}{\therefore p \rightarrow r}$	$\dfrac{p \vee q \quad \sim p}{\therefore q}$
$\dfrac{p}{\therefore p \vee R}$	$\dfrac{p \wedge q}{\therefore p}$
$\dfrac{p \quad q}{\therefore p \wedge q}$	$\dfrac{p \vee q \quad \sim p \vee r}{\therefore q \vee r}$