Rules of Inference

Equivalence	Name
$\begin{array}{l} p \\ p \to q \\ \hline \therefore \quad q \end{array}$	Modus ponens
$\begin{array}{l} \neg q \\ p \to q \\ \hline \therefore \quad \neg p \end{array}$	Modus tollens
$\begin{array}{l} p \to q \\ q \to r \\ \hline \therefore \quad p \to r \end{array}$	Hypothetical Syllogism
$\begin{array}{l} p \lor q \\ \neg p \\ \hline \therefore \quad q \end{array}$	Disjunctive Syllogism
$\begin{array}{l} p \\ \hline \therefore \quad p \lor q \end{array}$	Addition
$\begin{array}{l} p \land q \\ \hline \therefore \quad p \end{array}$	Simplification
$\begin{array}{l} p \\ q \\ \hline \therefore \quad p \land q \end{array}$	Conjunction
$\begin{array}{l} p \lor q \\ \neg p \lor r \\ \hline \therefore \quad q \lor r \end{array}$	Resolution
$\begin{array}{l} \big(\forall x \mid x \in D : P(x)\big) \\ \hline \therefore \quad P(c/x) \end{array}$	Universal Instantiation
$\begin{array}{l} P(c/x) \\ \hline \therefore \quad \big(\forall x \mid x \in D : P(x)\big) \end{array}$	Universal Generalization
$\begin{array}{l} \big(\exists x \mid x \in D : P(x)\big) \\ \hline \therefore \quad P(c^*/x) \end{array}$	Existential Instantiation
$\begin{array}{l} P(c^*/x) \\ \hline \therefore \quad \big(\exists x \mid x \in D : P(x)\big) \end{array}$	Existential Generalization