Standard Valid Argument Forms

Modus Ponens

If p, then q.
p

$\therefore q$

Modus Tollens

If p, then q.
$\sim q$

$\therefore \sim p$

Generalization

$$\frac{p}{\therefore p \vee q} \qquad \frac{q}{\therefore p \vee q}$$

Specialization

$$\frac{p \wedge q}{\therefore p} \qquad \frac{p \wedge q}{\therefore q}$$

Conjunction

$$\frac{\begin{array}{c} p \\ q \end{array}}{\therefore p \wedge q}$$

Elimination

$$\frac{\begin{array}{c} p \vee q \\ \sim p \end{array}}{\therefore q} \qquad \frac{\begin{array}{c} p \vee q \\ \sim q \end{array}}{\therefore p}$$

Transitivity of Implication

$$\frac{\begin{array}{c} p \to q \\ q \to r \end{array}}{\therefore p \to r}$$

Proof by Division into Cases

$$\frac{\begin{array}{c} p \vee q \\ p \to r \\ q \to r \end{array}}{\therefore r}$$

(Proof-by-) Contradiction Rule

$$\frac{\sim p \to (r \wedge \sim r)}{\therefore p}$$

Proof by Contradiction Rule:

If one can show that the hypothetical assumption that p is False leads logically to a contradiction, then one can conclude that p is True.

Standard Fallacy Forms

Fallacy of the Converse (Converse Error)	Fallacy of the Inverse (Inverse Error)
If p, then q. q ——— ∴ p	If p, then q. ~p ——— ∴ ~q

The Fallacy of the Converse gets its name from the fact that it comes about from an attempt to apply Modus Ponens, but confusing the conditional with its converse.

The Fallacy of the Inverse gets its name from the fact that it comes about from an attempt to apply Modus Ponens, but confusing the conditional with its inverse.