Summary of Rules of Inference

KC

Table 2.3.1   Valid Argument Forms

Modus Ponens

$p \rightarrow q$
p
$\therefore q$

Elimination

(a) $p \lor q$
$\sim q$
$\therefore p$

(b) $p \lor q$
$\sim p$
$\therefore q$

Modus Tollens

$p \rightarrow q$
$\sim q$
$\therefore \sim p$

Transitivity

$p \rightarrow q$
$q \rightarrow r$
$\therefore p \rightarrow r$

Generalization

(a) p
$\therefore p \lor q$

(b) q
$\therefore p \lor q$

Specialization

(a) $p \land q$
$\therefore p$

(b) $p \land q$
$\therefore q$

Conjunction

p
q
$\therefore p \land q$

Proof by Cases

$p \lor q$
$p \rightarrow r$
$q \rightarrow r$
$\therefore r$

Proof by Contradiction

$\sim p \rightarrow \perp$
$\therefore p$