

## Some Laws of Logic

DeMorgan's Laws: (a)  $\sim(p \wedge q) \equiv \sim p \vee \sim q$       (b)  $\sim(p \vee q) \equiv \sim p \wedge \sim q$

Conditional Equivalence:  $p \rightarrow q \equiv \sim p \vee q$

[For simplicity, we will assume without need for justification, the commutative property of  $\wedge$  and  $\vee$ . For example,  $\sim p \vee q \equiv q \vee \sim p$ . ]

The seven basic valid arguments are called Modus Ponens, Modus Tolens, Hypothetical Syllogism, Disjunctive Syllogism, Addition, Simplification and Conjunction:

M.P.	$\frac{P \rightarrow Q}{P} \therefore Q$	M.T.	$\frac{P \rightarrow Q}{\sim Q} \therefore \sim P$	H.S.	$\frac{P \rightarrow Q}{Q \rightarrow R} \therefore P \rightarrow R$	D.S.	$\frac{P \vee Q}{\sim P} \therefore Q$
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ADD:	$\frac{P}{\therefore P \vee Q}$	SIMP:	$\frac{P \wedge Q}{\therefore P}$	CONJ:	$\frac{P}{Q} \therefore P \wedge Q$
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