Theorems

We have categorically derived within S_s (or could do so) the formulae listed below. We will call any formulae that is categorically derivable in S_s a *theorem*.

[1a]	$p \equiv \sim\sim p$	Double negation
[2a]	$(p \wedge q) \supset p$	Simplification
[2b]	$(p \wedge q) \supset q$	Simplification
[3]	$((p \supset q) \wedge p) \supset q$	Modus Ponens
[4]	$((p \supset q) \wedge \sim q) \supset \sim p$	Modus Tollens
[5]	$(p \supset q) \equiv (\sim q \supset \sim p)$	Contrapositive
[6]	$((p \supset q) \wedge (q \supset r)) \supset (p \supset r)$	Hypothetical Syllogism
[7a]	$((p \vee q) \wedge \sim p) \supset q$	Disjunctive Syllogism
[7b]	$((p \vee q) \wedge \sim q) \supset p$	Disjunctive Syllogism
[11]	$p \supset (p \vee q)$	Addition
[12a]	$\sim(p \wedge q) \equiv (\sim p \vee \sim q)$	deMorgan Rule
[12b]	$\sim(p \vee q) \equiv (\sim p \wedge \sim q)$	deMorgan Rule
[13]	$(p \supset q) \equiv (\sim p \vee q)$	Implication
[14]	$((p \supset q) \wedge (r \supset s) \wedge (p \vee r)) \supset (q \vee s)$	Constructive Dilemma
[15]	$((p \supset q) \wedge (r \supset s)) \wedge (\sim q \vee \sim s) \supset (\sim p \vee \sim r)$	Destructive Dilemma
[16]	$\sim(p \wedge \sim p)$	Noncontradiction
[17]	$p \vee \sim p$	Excluded Middle
[18a]	$p \vee (q \vee r) \equiv (p \vee q) \vee r$	Associative
[18b]	$p \wedge (q \wedge r) \equiv (p \wedge q) \wedge r$	Associative
[19a]	$(p \wedge q) \equiv (q \wedge p)$	Commutative
[19b]	$(p \vee q) \equiv (q \vee p)$	Commutative
[20a]	$p \vee (q \wedge r) \equiv (p \vee q) \wedge (p \vee r)$	Distribution
[20b]	$p \wedge (q \vee r) \equiv (p \wedge q) \vee (p \wedge r)$	Distribution