

Discrete Mathematics—Class 8—Thursday, February 5, 2004

Logic symbols and their meanings

and - \wedge	$p \wedge q$	
or - \vee	$p \vee q$	
not- \neg (\sim)	$\neg p$	Asserts that p is false
implies - \rightarrow (if, then)	$p \rightarrow q$	Asserts that p is true implies q is true
exactly one - \oplus		Asserts exactly one of p, q is true
if and only if - \leftrightarrow	$p \leftrightarrow q$	Asserts that p and q have the same truth value

P, Q, R, S - variables that will stand for propositions

We use these logical operations (connectives) to build new propositions from old ones.

For example: To say “P is the proposition $7 > 5$ ”.

We will write	p: $7 > 5$	This proposition is TRUE
	q: John is tall	This proposition is FALSE
	r: It rained on Monday	This proposition is FALSE
	s: dinosaurs are extinct	This proposition is TRUE

We would then use the following compound propositions:

($p \wedge r$) is the proposition which assumes that both p and r are true.

Since p is true and r is false this proposition is false.

($p \vee r$) is the proposition that either p is true or r is true or both.

Since p is the true proposition this proposition is true.