

Math 321

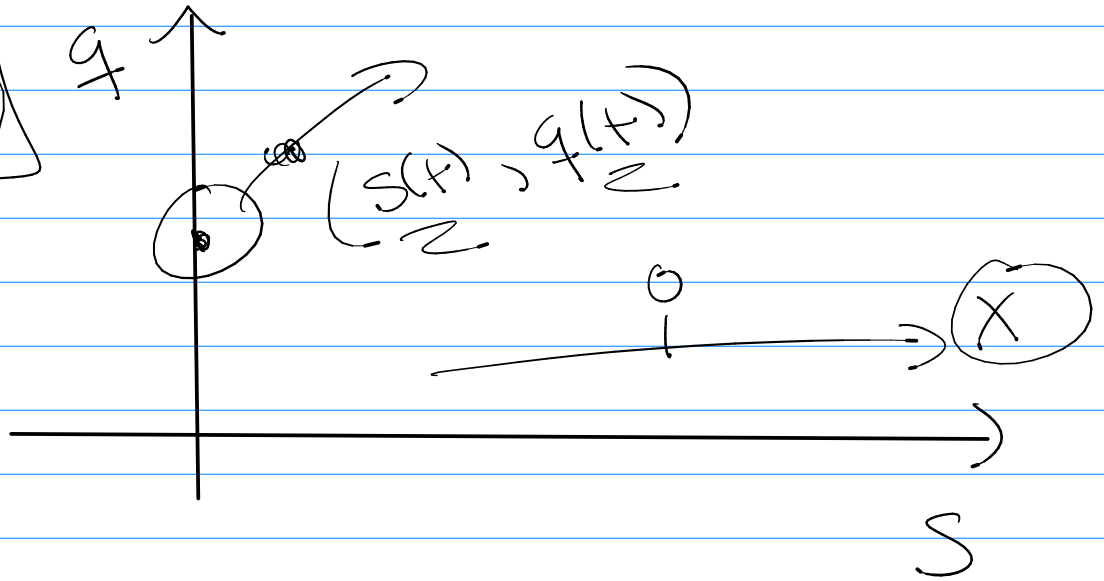
1.1

Math = toys + rules

Propositional
logic

Propositions

Modeling



Human Language

(x/p) → Declarative sentence that is true or false, but not both.

Call these: Propositions

ex: My name is Mark

Variables: letter that represents a proposition

p, q, r, M, \dots

P
T
F

P	Q
T	T
T	F
F	T
F	F

P	Q	\neg
T	T	F
T	F	T
F	T	T
F	F	T

Operations:

① Negation: "it is not the case that, P"
 "not P" $\neg P$

P	$\neg P$
T	F
F	T

- ② Conjunction "P and Q" $P \wedge Q$
- ③ Disjunction "P or Q" $P \vee Q$
- ④ Exclusive or "P or Q" $P \oplus Q$
- ⑤ Conditional "if P, then Q" $P \rightarrow Q$

\sqsupset
 is suff.

\rightarrow Δ
 is nec.

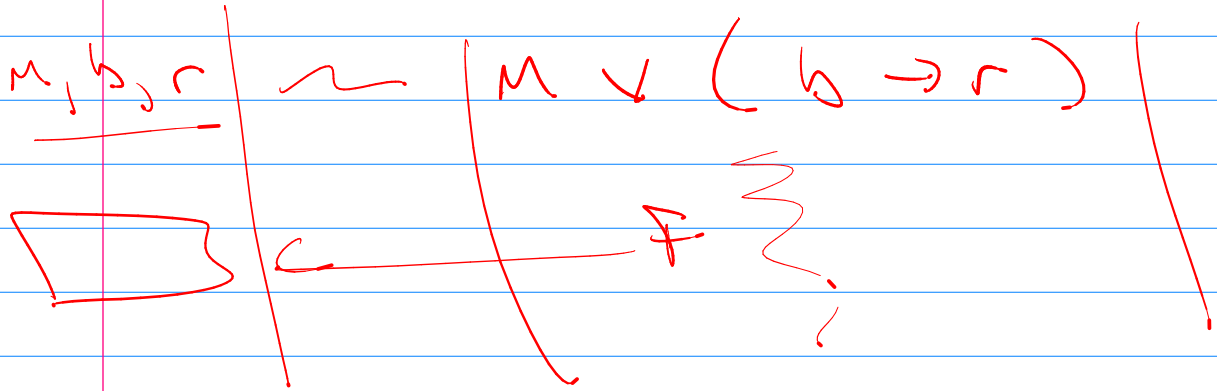
② biconditional "p if and only if q"

$$p \leftrightarrow q$$

p	q	$\neg p$	$\neg q$	$p \wedge q$	$p \vee q$	$p \oplus q$	$p \rightarrow q$	$p \leftrightarrow q$
T	T	F	F	T	T	F	T	T
T	F	F	T	F	T	T	F	F
F	T	T	F	F	T	T	T	F
F	F	T	T	F	F	F	T	T

Orders of operations

Brackets	grouping	0	grouping	6
	>	1	\neg	7
	\wedge	2	\vee	8
	\times	3		
	\rightarrow	4		
	\leftrightarrow	5		



gitops

ONF INT

