

lec # 2:-

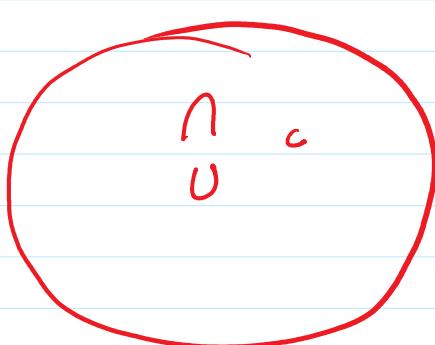
propositional logic.

Proposition:- A declarative statement which is either true or false but not both.

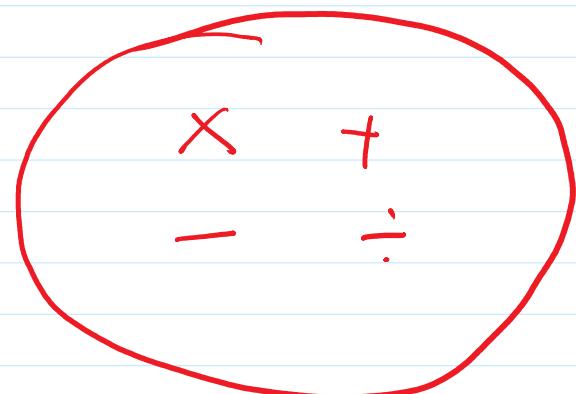
Ex1 :- P1 Washington DC is the Capital of US. ✓
P2 $1+1=2$ ✓
 $2+2=5$ ✓

Ex2 :- P1 $x+1=2$ X
P2 $x+y=2$ X.

what is the time right now? X.



Set



Number.

Propositional Variable:-

A variable which represents a proposition.

P

Ex3 :- Today is Friday.

Ex3 : $\frac{P_3}{}$ Today is Friday.

Let P_2 "Today is Friday".

Ex4 HW.

OPERATIONS :-

1 - Negation.

"Not" "It is not ^{the} case".

P	$\neg P$	$\neg(\neg P)$
T	F	T
F	T	F

Q1: Find the negation of the statement
"Today is Friday".

Ans:- Let P_2 "Today is Friday".

$$P_2 \neg(\neg P).$$

$\neg P_2$ "Today is not Friday".

Q2: Find. ^{Negation of.} $1+1=2$.

Ans:- Let P_2 $1+1=2$.

$$\neg(=) = \neq$$

$$\neg(>) = \leq$$

$$\neg(\neq) = <$$

$$\neg(<) = \geq$$

$$\neg(\geq) = >.$$

Conjunction :- "and" "But"

\wedge

P	q	$P \wedge q$
T	T	T
T	F	F
F	T	F

T	R	P
F	T	
F	F	

Exs :-
P₁

P₂ It is Friday.
Q₁ Today is raining.

Find Conjunction.

P \wedge Q

= It is Friday and
Today is raining.

Variables
Values

S, T, U - (Variable)

A, B, C, D, E (Val.)

S ²	S'	S°
S	T	U
A	A	A
A	A	B
A	A	C
A	B	D
A	B	E
1	1	1
1	1	1
1	1	1

Combinations.

Q :- It is Friday ^P and today is not raining _q

$$\begin{array}{l} P \quad 1 \rightarrow q \\ \neg T \quad 1 \rightarrow F \\ T \quad A \quad T \\ T \end{array}$$

$$3(u+s)$$

Disjunction
V

"OR" "Either"

P	q	P \vee q
T	T	

T	T
T	F
F	T
F	F

T
T
F

Implication:- \rightarrow

"If p then q ".

" q , when p ".

" p is sufficient for q ".

P	q	$P \rightarrow q$
T	T	T
T	F	F
F	T	T
F	F	T

of I win election then I will lower the taxes.

$\frac{E \wedge T}{P \wedge T}$: Let p_1 "Maria learns DM"
 q_2 . "Maria finds a Job".

$P \rightarrow q =$ if Maria learn DM Then
Maria finds a Job.

Find the truth value.

If (today is Friday) then ($2+3=5$) = ?

If (today is Friday) Then ($2+3=6$) = ?

$$P \rightarrow q \\ T \rightarrow T = T$$

$$P \rightarrow q \\ T \rightarrow F = F$$

Next lecture

Central position, Convex, Jensen.