Argument a list of premises followed by a cendusion

Logic form: (p.1p1... 1pp) -> ?

Argument Form:

· · · heause

p~

pa

5 % Shorefene

All whales are mammale

Mammale are warm blooded

Therefore all whales are warm blooded.

Translation 1

P(x): x is a whale.

QG: X is a mammal

Ras: X is warm bladed

Vx (Ph) -> O(x))

Fx (Ow) > Rh)

... Yx (Ph) -> Rha)



All computer science students are good at mach

I'm not good at mach

therefore I'm not a CS student

Introduce

Pla): x isaCS student

Olgo: x is good at mach

 $\frac{P}{\sqrt{n}} \left(\frac{P}{\sqrt{n}} - \frac{Q}{\sqrt{n}} \right)$

70(I)

·. 7 P(I)

An orgament is valid if it is impossible for
the or conclusion to be false when all
the premises are True, i.o., the underlying iplican
is a tautology.

(P,1P1-1Pk)-> 8

POP FT

If Sean travels to a conference then 261 will be replace by an assum. 261 lecture is replaced by an aram therefore Sean travels to a conference (p=6)18)->p

if I trave loceure = aram lecture is Not replaced by an even therefore I'diln't travel ~ 7p

Pules of Infarence

6)
	こ	ļ

(.	Pal)
5	P ?

Modus Ponens

カラく

Nudus Tallens

78

5.7p

Pf:

p-26 > by consapositive (19)-(1p) lugic equivalence (19) > modus ponom

: 71

PZC

9-78

hypothotic syllogism

- クラア

(3)

Disjurtire Syllogism

TP

To go g murbe T pis F

Assuming back premises (pVg) and (Tp)

are true check to see if it's possible

for g to be F.

pvs addition

Simplification

Simplification

PAR

(10)

Cin juacion

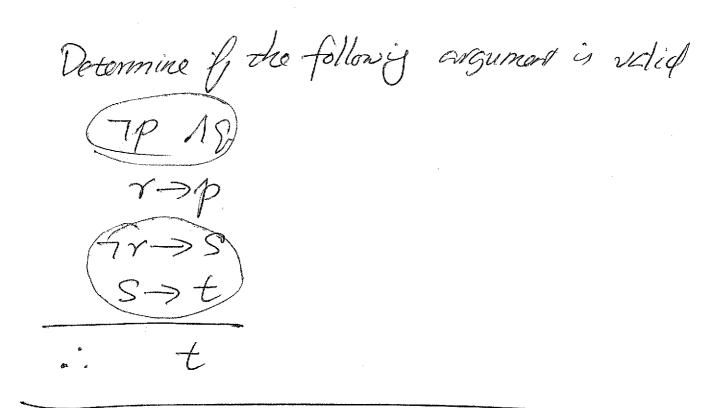
P 2 i ply

Pesdution;

PVS

TPVOT

a gvr



Pf:

TP > Simplification

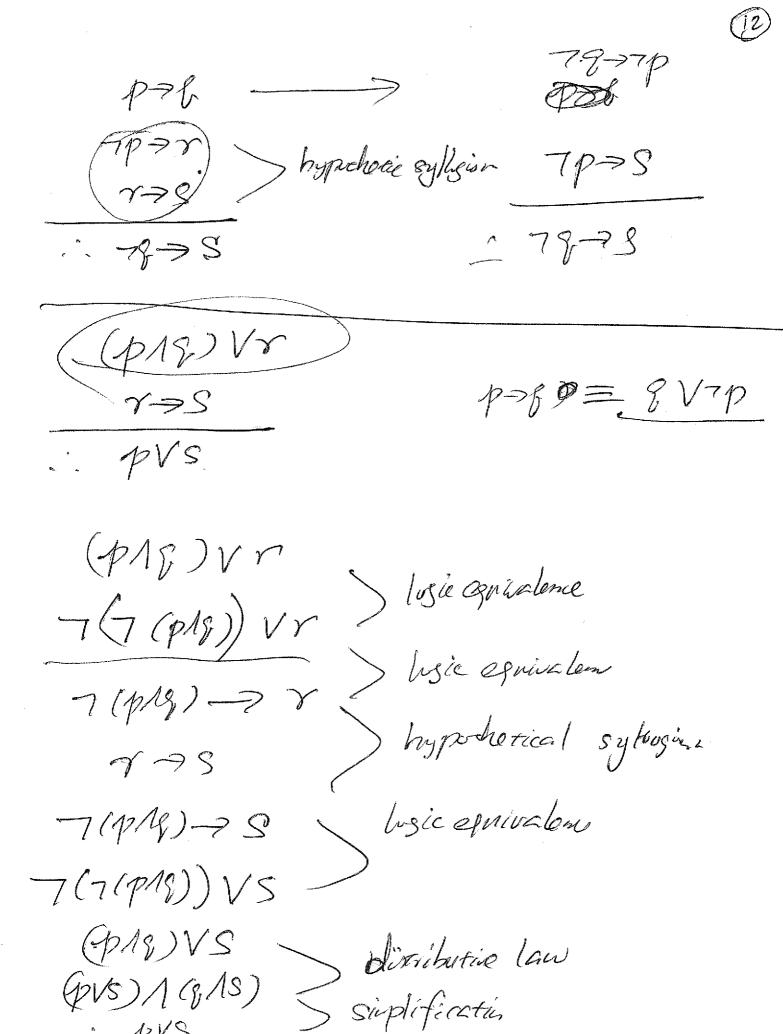
TP > modus Tollons

Tr

Do 17-38 | modus ponens

S > modus ponens

S > modus ponens



Rules of Inference with Quantifiers
Universal Inventiation
Vx P(x)
PCC) Cisa particular instance, individua
Universal Generalization
P(c) for arbitrary invance C.
· · · · · · · · · · · · · · · · · · ·
Zierrential Internation.
JX PK)
P(c) for some partialer interne

Existential Generalization

P(1) for some paretodas C

JX PM

(14)

All CS saudents are good at mach.
I'm not good at poor mach
therefore I'm not CS.

PROSERS CS

Q(x): xis god at mach

Hx (P(x) -> 6(x)

P ~ TQ (Sean)

Vx (P(x) > O(x)

P(Saa) -> O(Sean)

T O(Sean)

- 7 P (Sean)

> runivosal instantiation > modus Tollan

7 P(Sean)

Logic and Prof
Recall an odd number n can be wriden as
2ktl for integer k. (nisodd = n=2k+1
Prove that if n is odd, then no is odd
P(n): n is odd
Gla): no is odd
$\forall n \left(P(n) \rightarrow Q(n) \right)$
Need.
P(c) -> Q(c) for abitaly C
: Yn (P(n) >6(n))
In other words were need to show

A Fer abitrary of if o is odd then or is odd

C is odd C = 2k+1 $C' = 4bx (k+1)^{2} - 4bx (k+1) - 2(2k+h) + 1$ $C^{2} = 5 \text{ odd},$