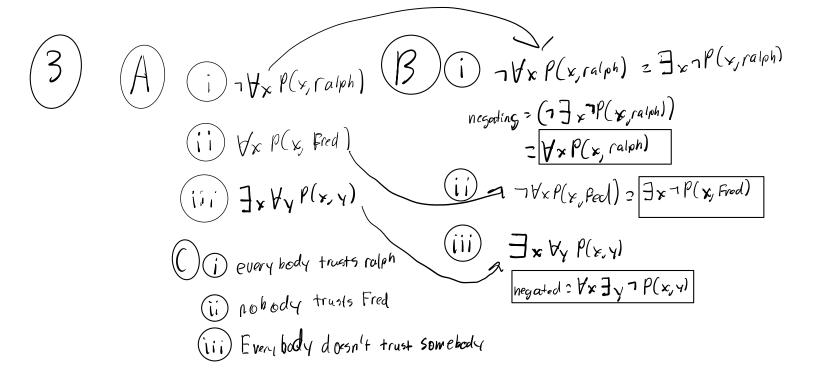
there exists positive integers that when squared are larger than 4. Also could be said numbers that are not less than or equal to 4

- all of the students in the class  $\forall_{\kappa} P(\kappa, H, F)$  have read Huck Finn
- $\exists_{x} \forall \gamma \beta(x, \gamma) = \text{there is a student in the class}$ who has read all of the books
  by Mark Twain



(U)	$p \rightarrow$	a				
	'	p a	p -> q	$\neg \rho$	79	hone of truin
	$\neg p$	T T	Т	F	r	values live up
		ĵ F	F	F	T	
		F T	T	T	٦	
		.P F	T	T	1	
not valid						

5 ? ralph has a sore shoulder p2 buys popcorn 5 2 ralph feels sick b ? (1 goos bowling M= goes to the movie 75 V 75 -> 61 M  $M \rightarrow \rho$ 7p 1, 5 (1) 75 V 75 -> b 1 m nypoth

(1) 75 V 75 -> b 1 m hypoth (2) m-> p hyp (3) 7p

- (y) -m modus tollens

(5)  $\neg (bvm) \rightarrow \neg (\neg s \land \neg 5)$  contrapositive

(7) 7 MV 7b (8) S/15 (9):, 5Bonus:  $\exists x (\mathcal{H}_x) \land \neg \beta(x))$  $\forall (\forall(x) \Rightarrow (x))$  $\frac{1}{2} = \frac{1}{2} \left( c(x) - \frac{1}{2} - \frac{1}{2} \beta(x) \right)$  $\exists x (A(x) \land \neg B(x))$  $(2) \forall (A(x) \Rightarrow (x))$ (3)  $A(x) \wedge \neg B(x)$ (4)  $A(x) \rightarrow C(x)$ 

 $-(6)(7bv7m)\rightarrow(515)$ 

double negation

addition

modus ponens

Simplification

h up othesis

l'aistential

instantion

Universal instant