

Predicates and Quantified Statements		
Universal	$\forall x \in D, P(x)$	$\exists x \in D, \sim P(x)$
Existential	$\exists(x,y) \in D, x \neq y P(x,y)$	$\forall(x,y) \in D, x \neq y \sim P(x,y)$
Universal Conditional	$\forall x, P(x) \rightarrow Q(x)$	$\exists x \in D P(x) \wedge \sim Q(x)$
\sim existential = universal \sim universal = existential		

More Formal Statements	
Formal Contrapositive	$\forall x \in D, \sim Q(x) \rightarrow \sim P(x)$
Formal Converse	$Q(x) \rightarrow P(x) \forall x \in D$
Formal Inverse	$\forall x \in D, \sim P(x) \rightarrow \sim Q(x)$

MQ Invalid Arguments	
Quantified Converse	$\forall x, P(x) \rightarrow Q(x)$ $Q(j)$ for a particular j $\therefore P(j)$
Quantified Inverse Error	$\forall x, P(x) \rightarrow Q(x)$ $\sim P(j)$ for a particular j $\therefore \sim Q(j)$

Multiple Quantifiers		
Existential MQ	$\exists x \in D \forall y \in E, P(x, y)$	
Neg. MQ	$\forall x \in D, \exists y \in E P(x, y)$ [original]	$\exists x \in D, \forall y \in E \sim P(x, y)$ [negation]
Universal Modes Pones	$\forall x \in Z, P(x) \rightarrow Q(x)$ $P(k)$, for a particular $k \in Z$ $\therefore \sim Q(k)$	
Universal Modus Tones	$\forall x \in D, P(x) \rightarrow Q(x)$ $\sim Q(j), j \in D$ $\therefore \sim P(j)$	

