Logical reasoning:	Symbols	Definition/Example
Conditional statement if-then	$p \rightarrow q$	Statement that can be written as an if-then statement
Hypothesis (p)	p	Part "p" of a conditional statement following the if
Conclusion (q)	q	Part "q" of the conditional following the then
Converse FLIPS	$q \rightarrow p$	Statement formed by flipping the hypothesis and conclusion
Inverse Negates	$\sim p \rightarrow \sim q$	Statement formed Negating the hypothesis and conclusion
Contrapositive Flips and Negates	$\sim q \rightarrow \sim p$	Statement formed by both exchanging and negating the hypothesis and conclusion
Biconditional ★Definitions, Rules★ ☺ Conditional and the converse Must both be true!	$p \leftrightarrow q$	Statement that can be written in the form if and only if (iff) (this means "if p then q" and "if q then p")
Negation	Not ($\sim$)	Negation of a statement p is "not p" (Negation of a true statement is false and of a false statement is true)
Counterexample		An reason statements, examples that proves a statement false

Logical Reasoning

	Symbol	Example 1: Tom lives in Mansfield Texas	Example 2: Parallel lines do not intersect.
Conditional Statement if-then	$p \to q$	If TOM lives in Mansfield, then he lives in Texas. (F)	$(p \to q)$ If lines are parallel, then they do NOT intersect. (T)
Hypothesis p (if)		**Conclusion** q (then)	**Hypothesis** p (if) / **Conclusion** q (then)
TOM lives in Mansfield		he lives in Texas.	lines are parallel / they do NOT intersect.
Converse FLIP	$q \to p$	If TOM lives IN Texas, then he lives IN Mansfield. (F)	$(q \to p)$ If lines do NOT intersect, then they are parallel. (T)
Inverse Negates	$\sim p \to \sim q$	If TOM does NOT live in Mansfield, then he does NOT live in Texas.	$(\sim p \to \sim q)$ If lines are NOT parallel, then they intersect.
Contrapositive Flips and Negates	$\sim q \to \sim p$	If TOM does NOT live in Texas, then he does NOT live in Mansfield.	$(\sim q \to \sim p)$ If lines intersect, then they are NOT parallel.
Biconditional Statement (if and only if)	$p \leftrightarrow q$	Counterexample: He lives IN Mansfield, OH	Biconditional Statement: $p \leftrightarrow q$ (if and only if) Lines are parallel if and only if they do NOT intersect.
counterexample			

* Conditional and its converse MUST be true!