

M118, Chapter 1 Review sheet

- **Logical Equivalence:** When they have identical truth values under identical truth conditions of the simple statement (*When two statements have identical last column in the truth tables*)
 - **Tautology = valid argument:** is a statement that is true for all possible combinations of truth conditions for the component statement (*the elements of the last column are all T*)
 - **Contradiction:** is a statement that is false for all possible combinations of truth conditions for the component statement (*The elements of the last column are all F*)
 - **Conditional:** $p \rightarrow q$ if p then q
 - **Biconditional:** $p \leftrightarrow q$ If and only If p then q
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p : The weather is cold q : You will wear a coat

- **Conditional:** $p \rightarrow q$ if p then q
The condition: If the weather is cold, then you will wear a coat
 - **Converse:** $q \rightarrow p$
The converse: If you wear a coat, then the weather is cold
 - **Inverse:** $\sim p \rightarrow \sim q$
The inverse: If the weather is not cold, then you will not wear a coat
 - **Contrapositive:** $\sim q \rightarrow \sim p$
The contrapositive : If you will not wear a coat, then the weather is not cold
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				<i>Disjunction</i> $p \text{ or } q$	<i>Conjunction</i> $p \text{ and } q$	<i>Conditional</i> <i>if p then q</i>	<i>Converse</i> <i>if q then p</i>	<i>Inverse</i> <i>if $\sim q$ then $\sim p$</i>	<i>Contrapositive</i> <i>if $\sim p$ then $\sim q$</i>	<i>Biconditional</i> <i>if and only if</i>
p	q	$\sim p$	$\sim q$	$p \vee q$	$p \wedge q$	$p \rightarrow q$	$q \rightarrow p$	$\sim p \rightarrow \sim q$	$\sim q \rightarrow \sim p$	$p \leftrightarrow q$
T	T	F	F	T	T	T	T	T	T	T
T	F	F	T	T	F	F	T	T	F	F
F	T	T	F	T	F	T	F	F	T	F
F	F	T	T	F	F	T	T	T	T	T