

Meanings of The Connectives.

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Disjunction and biconditional.

- exclusive OR does not allow both formulas to be true. whereas inclusive OR does.
- $(a \oplus b) \equiv (\neg(a \rightarrow b))$
 - exclusive OR: 2 formulas have to have different values
 - biconditional: 2 formulas have to have the same value.

Conditional:

- distinguish the truth value of the statement from the truth value of the conclusion.
- when the premise is false, the conditional is vacuously true.
"vacuous": the statement is useless, tells us nothing about the truth value of the conclusion.
- Think of an implication as a promise.
You can show that I broke my promise if the premise is true & the conclusion is false. — only case in which I broke my promise.
- If the premise is false, the statement is true because it'll never be contradicted.
- Conclusion $\equiv T$, statement $\equiv T$.
- premise $\equiv T$, statement \equiv conclusion.
- $P \rightarrow Q \equiv ((\neg P) \vee Q)$
Either the premise is false, or the conclusion is true, or both