Meanings of The Connectives.

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.

- \(p \rightarrow q \equiv (\neg p) \lor q\)
  Either the premise is false, or the conclusion is true, or both.