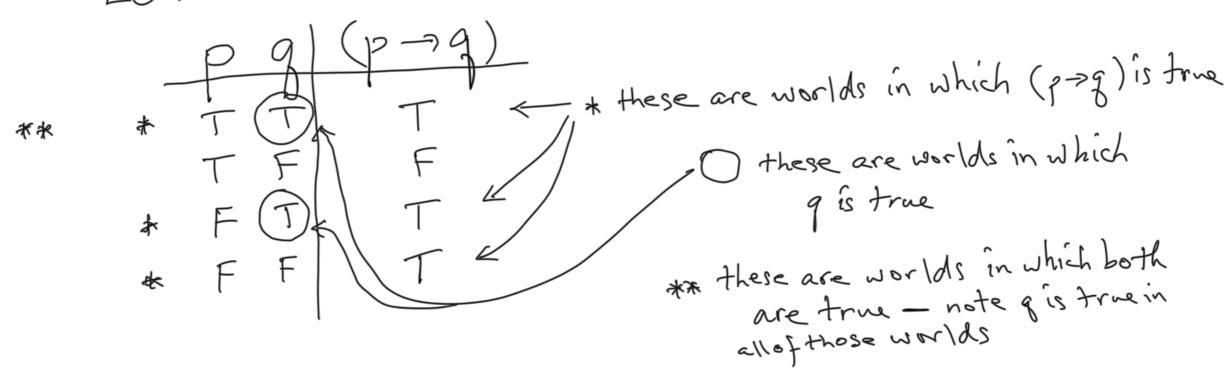
Semantic entailment (or simply, entailment) A relation between a set of wiffs and a wff The symbol for the entailment relation (double turnstyle) $\left\{ \omega f f_{1}, \omega f f_{2}, \ldots, \omega f f_{n} \right\} \vdash \omega f f$

Meaning of entailment (using the previous relation) whenever every wffi, --, wffn is true, wff is true (or in all worlds in which wff,,,, wffn are all true, wff is also true) (we say " off,, --, wff, entails wf") is equivalent to: if wff, , ..., wffn are frue then wff is true

Some interesting entailments {} Ex means that x is a fautology every world makes this set true so & has to be true in every world $\{\beta,7\beta\} \models A\}$ means that both x and 7x and $\{\beta,7\beta\} \models 7x$ are true no world makes this set true sod is true in all of those worlds and so is Td

Example of an entailment $\{(p\rightarrow q), P\} \models q$ every world means that g is also true in which these are true

Let's use a truth table



Another example of entailment

$$\{(P \rightarrow q), (q \rightarrow r)\} \vdash (P \rightarrow r)$$

Let's use a truth table

_er> w, ·	() ((a = r) 1	(p->r)
P 9 r T	$(p \rightarrow q)$	T -	T F
T T F T T F F	FF	T T T	T F T
FTT		1	T
F F T F F F		(T) -	 >

You've seen this last example before $\{\} \models ((p \rightarrow q) \land (q \rightarrow r)) \rightarrow (p \rightarrow r)$ Entai ment Note that whenever the and tantology conjuncts are true seem to be the conjunction is true Set notation and conjunction connected are used interchangebly through. when it makes sense to implication (-3) do so (They are!)

From inconsistent set of Wffs, every Wff is entailed. Let us use the implication form $(\alpha \wedge \neg \alpha) \rightarrow \beta \qquad (\alpha \wedge \neg \alpha) \rightarrow \neg \beta$

[para consistent logics]