

syn.1 Semantic Notions

sol:syn:sem:
sec The central logical notions of *validity*, *entailment*, and *satisfiability* are defined the same way for second-order logic as they are for first-order logic, except that the underlying satisfaction relation is now that for second-order **formulas**. explanation A second-order **sentence**, of course, is a **formula** in which all variables, including predicate and function variables, are bound.

Definition syn.1 (Validity). A sentence φ is *valid*, $\models \varphi$, iff $\mathfrak{M} \models \varphi$ for every **structure** \mathfrak{M} .

Definition syn.2 (Entailment). A set of sentences Γ *entails* a sentence φ , $\Gamma \models \varphi$, iff for every **structure** \mathfrak{M} with $\mathfrak{M} \models \Gamma$, $\mathfrak{M} \models \varphi$.

Definition syn.3 (Satisfiability). A set of sentences Γ is *satisfiable* if $\mathfrak{M} \models \Gamma$ for some **structure** \mathfrak{M} . If Γ is not satisfiable it is called *unsatisfiable*.

Photo Credits

Bibliography