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theory

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If L is a logical language for some logic \mathcal{L} , a set T of formulas with no free variables is called a *theory* (of \mathcal{L}). If \mathcal{L} is a first-order logic, then T is called a *first-order theory*.

We write $T \models \phi$ for any formula ϕ if every model \mathcal{M} of \mathcal{L} such that $\mathcal{M} \models T$, $\mathcal{M} \models \phi$.

We write $T \vdash \phi$ is for there is a proof of ϕ from T .

Remark. Let S be an L -structure for some signature L . The *theory of S* is the set of formulas satisfied by S :

$$\{\varphi \mid S \models \varphi\},$$

and is denoted by $\text{Th}(S)$.