

syn.1 Formulas

mvl:syn:fml:
mvl:syn:fml:^{sec}
defn:formulas

Definition syn.1 (Formula). The set $\text{Frm}(\mathcal{L})$ of *formulas* of a propositional language \mathcal{L} is defined inductively as follows:

1. Every **propositional variable** p_i is an atomic **formula**.
2. Every 0-place connective (propositional constant) of \mathcal{L} is an atomic **formula**.
3. If \star is an n -place connective of \mathcal{L} , and $\varphi_1, \dots, \varphi_n$ are **formulas**, then $\star(\varphi_1, \dots, \varphi_n)$ is a **formula**.
4. Nothing else is a **formula**.

If \star is 1-place, then $\star(\varphi_1)$ will often be written simply as $\star\varphi_1$. If \star is 2-place $\star(\varphi_1, \varphi_2)$ will often be written as $(\varphi_1 \star \varphi_2)$.

As usual, we will often silently leave out the outermost parentheses.

Example syn.2. In the standard language \mathcal{L}_0 , $p_1 \rightarrow (p_1 \wedge \neg p_2)$ is a formula. In the language of product logic, it would be written instead as $p_1 \rightarrow (p_1 \odot \neg p_2)$. If we add the 1-place Δ to the language, we would also have formulas such as $\Delta(p_1 \wedge p_2) \rightarrow (\Delta p_1 \wedge \Delta p_2)$.

Photo Credits

Bibliography