Aufgabe 3: Logic

Describe the following terms in your own words:

- Syntax
- Semantics
- Representation
- Presentation
- Interpretation

How do the terms above correlate to each other?

6 Punkte

Aufgabe 4: Semantic equivalence

Given: a set of elementary statements $A$, as well as the set of the formable boolean terms $T_A$.

Prove that for each boolean term $T$ of $T_A$ applies:

(a) $T \land \neg T \equiv 0$
(b) $T \lor \neg T \equiv 1$
(c) $0 \land T \equiv 0$
(d) $1 \land T \equiv T$

8 Punkte

Aufgabe 5: Syntactic and semantic level

The set of elementary statements $A = \{A, B, C\}$ and the following Boolean terms are given:

$T_1 := (A \land B) \rightarrow C$
$T_2 := (A \rightarrow B) \rightarrow (A \rightarrow C)$

Show the semantic equivalence of $T_1$ and $T_2$ on $A$
(a) on syntactical level (by term conversions, like in the script with argumentations/explanations for the individual steps)

(b) on the semantic level (through truth tables)

Hint:
Besides the semantic equivalences reported in the script you can also use those of exercise 4 and the equivalences \(1 \lor T \equiv 1\) and \(0 \lor T \equiv T\).