

## The axioms

All instances of the following schemata and rules are axioms of the theory  $\mathcal{A}$ :

### Definition

- A1 all axioms and rules of first-order predicate logic including the identity axioms.
- A2  $\overline{a} \wedge \overline{b} = \overline{ab}$ , where  $a$  and  $b$  are arbitrary strings of symbols.
- A3  $\text{q}(\overline{a}) = \overline{\overline{a}}$
- A4  $\text{sub}(\overline{a}, \overline{b}, \overline{c}) = \overline{d}$ , where  $a$  and  $c$  are arbitrary strings of symbols,  $b$  is a single symbol (or, equivalently, a string of symbols of length 1), and  $d$  is the string of symbols obtained from  $a$  by replacing all occurrences of the symbol  $b$  by the strings  $c$ .