0.1 Reduced Type Derivation

A reduced type derivation is one where subtype and subeffect rules must, and may only, occur at the root or directly above an **if**, or **apply** rule.

In this section, I shall prove that there is at most one reduced derivation of $\Gamma \vdash t : \tau$. Secondly, I shall present a function for generating reduced derivations from arbitrary typing derivations, in a way that does not change the denotations. These imply that all typing derivations of a type-relation have the same denotation.

0.2 Reduced Type Derivations are Unique

0.2.1 Variables

0.2.2 Constants

0.2.3 Value Terms

0.2.4 Computation Terms

0.3 Each type derivation has a reduced equivalent with the same denotation.

0.3.1 Constants

0.3.2 Value Types

0.3.3 Computation Types

0.4 Denotations are Equivalent