

SYNTAX

$t ::=$

true
| false
| zero
| succ t
| pred t
| iszero t
| not t
| and t t
| or t t

SEMANTICS

Evaluation (for not, and & or abstractions):

NOT

- $\frac{t \rightarrow \text{true}}{\text{not } t \rightarrow \text{false}}$ E-NOTTRUE
- $\frac{t \rightarrow \text{false}}{\text{not } t \rightarrow \text{true}}$ E-NOTFALSE
- $\frac{t \rightarrow t'}{\text{not } t \rightarrow \text{not } t'}$ E-NOT

AND

- and true false \rightarrow false E-ANDTRUEFALSE
- and false true \rightarrow false E-ANDFALSE
- and false false \rightarrow false E-ANDFALSETRUE
- and true true \rightarrow true E-ANDTRUE
- $\frac{t_1 \rightarrow t_1'}{\text{and } t_1 t_2 \rightarrow \text{and } t_1' t_2}$ E-AND1
- $\frac{t_2 \rightarrow t_2'}{\text{and } v t_2 \rightarrow \text{and } v t_2'}$ E-AND2

OR

- or true false -> true
- or false true -> true
- or false false -> false
- or true true -> true

E-ORTRUEFALSE

E-ORFALSETRUE

E-ORFALSE

E-ORTRUE

- $\frac{t1 \rightarrow t1'}{\text{or } t1 \ t2 \rightarrow \text{or } t1' \ t2}$
- $\frac{t2 \rightarrow t2'}{\text{or } v \ t2 \rightarrow \text{or } v \ t2'}$

E-OR1

E-OR2