

7 $\lambda x. \lambda y. \text{if } x \text{ then } y \text{ else succ}(\text{zero})$
 | ABS

6 $\lambda y. \text{if } x \text{ then } y \text{ else succ}(\text{zero})$
 | ABS

5 $\text{if } x \text{ then } y \text{ else succ}(\text{zero})$
 | | |
 1 x 2 y 4 $\text{succ}(\text{zero})$
 |
 3 zero

1) $x:t_1 \vdash x:t_1$

2) $y:t_2 \vdash y:t_2$

3) $\vdash \text{zero} : \text{Nat}$

4) $S = \text{mgu} \{ \text{Nat} \doteq \text{Nat} \} = \emptyset$
 $\vdash \text{succ}(\text{zero}) : \text{Nat}$

5) $S = \text{mgu} \{ t_1 \doteq \text{Bool}, t_2 \doteq \text{Nat} \} = \{ t_1 := \text{Bool}, t_2 := \text{Nat} \}$

$x:\text{Bool}, y:\text{Nat} \vdash \text{if } x \text{ then } y \text{ else succ}(\text{zero}) : \text{Nat}$

6) $x:\text{Bool} \vdash \lambda y:\text{Nat}. \text{if } x \text{ then } y \text{ else succ}(\text{zero}) : \text{Nat} \rightarrow \text{Nat}$

7) $\vdash \lambda x:\text{Bool}. \lambda y:\text{Nat}. \text{if } x \text{ then } y \text{ else succ}(\text{zero}) : \text{Bool} \rightarrow \text{Nat} \rightarrow \text{Nat}$