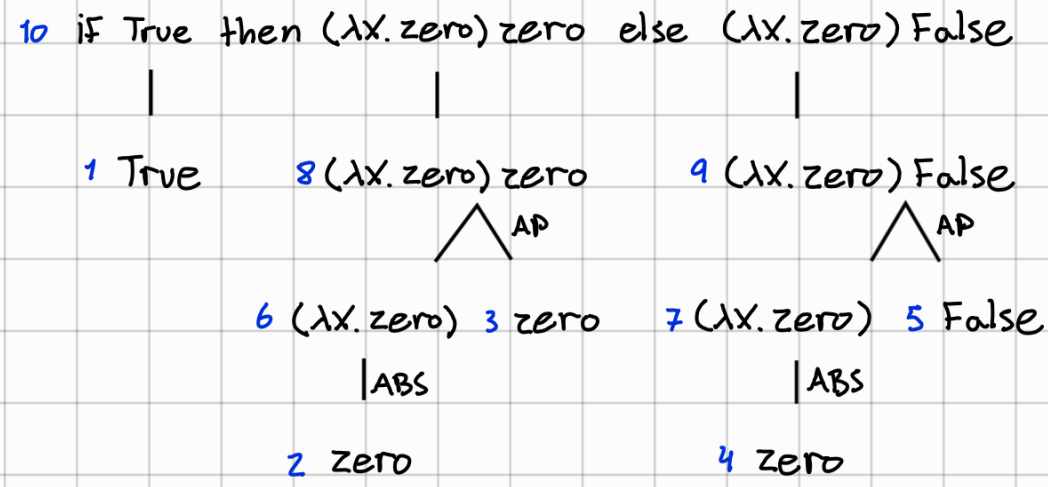

1) $\vdash$ True : Bool
2) $\vdash$ zero : Nat
3) $\vdash$ zero : Nat
4) $\vdash$ zero : Nat
5) $\vdash$ False : Bool

6) $\vdash \lambda X{:}t_1.\ \text{zero} : t_1 \to \text{Nat}$
7) $\vdash \lambda X{:}t_2.\ \text{zero} : t_2 \to \text{Nat}$

8) $S = mgu\{t_1 \to \text{Nat} \doteq \text{Nat} \to t_3\}$
$= mgu\{t_1 \doteq \text{Nat},\ \text{Nat} \doteq t_3\}$ decompose
$= mgu\{t_1 \doteq \text{Nat},\ t_3 \doteq \text{Nat}\}$ swap
$= \{t_1 := \text{Nat},\ t_3 := \text{Nat}\}$ elim 2 veces

$\vdash (\lambda X{:}\text{Nat}.\ \text{zero})\ \text{zero} : \text{Nat}$

9) $S = mgu\{t_2 \to Nat \doteq Bool \to t_4\}$ decompose

$= mgu\{t_2 \doteq Bool,\ Nat \doteq t_4\}$ swap

$= mgu\{t_2 \doteq Bool,\ t_4 \doteq Nat\}$ elim 2 veces

$= \{t_2 := Bool,\ t_4 := Nat\}$

$\vdash (\lambda X{:}Bool.\ zero)\ False : Nat$

10) $S = mgu\{Bool \doteq Bool,\ Nat \doteq Nat\} = \emptyset$ trivial 2 veces

$\vdash$ if True then $(\lambda X.\ zero)\ zero$ else $(\lambda X.\ zero)\ False : Nat$