Nr. 7)

a)
$$\dfrac{\dfrac{y : \text{int}}{\text{succ}(y) : \text{int}}\,(T\text{-succ}) \qquad z : \text{int}}{\text{if } x \text{ then succ}(y) \text{ else } z : \text{int}}\,(T\text{-If})$$

$\Gamma := \{x : \text{Bool}, y : \text{int}, z : \text{int}\}$

b)
$$\dfrac{\dfrac{x : \text{int}}{x : \text{int} \vdash \text{iszero}\, x : \text{Bool}}\,(T\text{-iszero})}{\vdash : (\lambda x : \text{Int is zero} x) : \text{int} \to \text{Bool}}\,(T\text{-Abs})$$

$= \text{Int} \to \text{Bool}$

N.2)

$$\dfrac{\dfrac{(x:Bool \to Bool) \in \{x:Bool \to Bool\ y:Bool\}}{x:Bool \to Bool, y:Bool \vdash x : Bool \to Bool}(T\text{-}Var) \quad \dfrac{(y:Bool) \in \{x:Bool \to Bool\ y:Bool\}}{x:Bool \to Bool, y:Bool \vdash y : Bool}(T\text{-}Var)}{\dfrac{x:Bool \to Bool, y:Bool \vdash xy : Bool}{\dfrac{x:Bool \to Bool \vdash \lambda y:Bool.\ xy : Bool \to Bool}{\vdash \lambda x:Bool \to Bool.\ \lambda y:Bool.\ xy : (Bool \to Bool) \to Bool \to Bool}(T\text{-}Abs)}(T\text{-}Abs)}(T\text{-}App)$$