

thm_2Eres__quan_2ERES__FORALL
(TMEidwyfzN79RJP3LrA3RaiukbKR44abGTU)

October 26, 2020

Definition 1 We define `c_2Emin_2E_3D` to be $\lambda A.\lambda x \in A.\lambda y \in A.inj_o (x = y)$ of type $\iota \Rightarrow \iota$.

Definition 2 We define `c_2Ebool_2EIN` to be $\lambda A.27a : \iota.(\lambda V0x \in A.27a.(\lambda V1f \in (2^{A-27a}).(\text{ap } V1f \ V0x)))$

Definition 3 We define `c_2Emin_2E_3D_3D_3E` to be $\lambda P \in 2.\lambda Q \in 2.inj_o (p \ P \Rightarrow p \ Q)$ of type ι .

Definition 4 We define `c_2Ebool_2ET` to be $(\text{ap } (\text{ap } (\text{c_2Emin_2E_3D } (2^2)) (\lambda V0x \in 2.V0x)) (\lambda V1x \in 2.V1x))$

Definition 5 We define `c_2Ebool_2E_21` to be $\lambda A.27a : \iota.(\lambda V0P \in (2^{A-27a}).(\text{ap } (\text{ap } (\text{c_2Emin_2E_3D } (2^{A-27a}))))$

Definition 6 We define `c_2Ebool_2ERES__FORALL` to be $\lambda A.27a : \iota.(\lambda V0p \in (2^{A-27a}).(\lambda V1m \in (2^{A-27a}).(\text{ap } (\text{ap } (\text{c_2Emin_2E_3D } (2^{A-27a}))))$

Assume the following.

$$\begin{aligned} & \forall A.27a.nonempty \ A.27a \Rightarrow (\forall V0P \in (2^{A-27a}).(\forall V1f \in \\ & (2^{A-27a}).((p \ (\text{ap } (\text{ap } (\text{c_2Ebool_2ERES__FORALL } \ A.27a) \ V0P) \ V1f))) \Leftrightarrow \\ & (\forall V2x \in A.27a.((p \ (\text{ap } (\text{ap } (\text{c_2Ebool_2EIN } \ A.27a) \ V2x) \ V0P)) \Rightarrow \\ & (p \ (\text{ap } \ V1f \ V2x)))))) \end{aligned} \quad (1)$$

Theorem 1

$$\begin{aligned} & \forall A.27a.nonempty \ A.27a \Rightarrow (\forall V0P \in (2^{A-27a}).(\forall V1f \in \\ & (2^{A-27a}).((p \ (\text{ap } (\text{ap } (\text{c_2Ebool_2ERES__FORALL } \ A.27a) \ V0P) \ V1f))) \Leftrightarrow \\ & (\forall V2x \in A.27a.((p \ (\text{ap } (\text{ap } (\text{c_2Ebool_2EIN } \ A.27a) \ V2x) \ V0P)) \Rightarrow \\ & (p \ (\text{ap } \ V1f \ V2x)))))) \end{aligned}$$