

thm_2Eres__quan_2ERES__EXISTS
(TMT7n93KpXv6U2UUHzAi7M1DgCTxQ7UpEXf)

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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 $\lambda A.27a : \iota.(\lambda V0x \in A.27a.(\lambda V1f \in (2^{A-27a}).(ap V1f V0x)))$

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_2E2T` to be $(ap (ap (c_2Emin_2E_3D (2^2)) (\lambda V0x \in 2.V0x)) (\lambda V1x \in 2.V1x))$

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

Definition 6 We define `c_2Ebool_2E_2F_5C` to be $(\lambda V0t1 \in 2.(\lambda V1t2 \in 2.(ap (c_2Ebool_2E_21 2) (\lambda V2t \in 2.V2t)))$

Definition 7 We define `c_2Emin_2E_40` to be $\lambda A.\lambda P \in 2^A.if (\exists x \in A.p (ap P x)) \mathbf{then} (the (\lambda x.x \in A \wedge p (ap P x)))$ of type $\iota \Rightarrow \iota$.

Definition 8 We define `c_2Ebool_2E_3F` to be $\lambda A.27a : \iota.(\lambda V0P \in (2^{A-27a}).(ap V0P (ap (c_2Emin_2E_40 A) P)))$

Definition 9 We define `c_2Ebool_2ERES__EXISTS` to be $\lambda A.27a : \iota.(\lambda V0p \in (2^{A-27a}).(\lambda V1m \in (2^{A-27a}).(ap (c_2Emin_2E_40 A) p)))$

Assume the following.

$$\begin{aligned} & \forall A.27a.nonempty A.27a \Rightarrow (\forall V0P \in (2^{A-27a}).(\forall V1f \in \\ & (2^{A-27a}).((p (ap (ap (c_2Ebool_2ERES__EXISTS A.27a) V0P) V1f))) \Leftrightarrow \\ & (\exists V2x \in A.27a.((p (ap (ap (c_2Ebool_2EIN A.27a) V2x) V0P)) \wedge \\ & (p (ap V1f V2x)))))) \end{aligned} \quad (1)$$

Theorem 1

$$\begin{aligned} & \forall A.27a.nonempty A.27a \Rightarrow (\forall V0P \in (2^{A-27a}).(\forall V1f \in \\ & (2^{A-27a}).((p (ap (ap (c_2Ebool_2ERES__EXISTS A.27a) V0P) V1f))) \Leftrightarrow \\ & (\exists V2x \in A.27a.((p (ap (ap (c_2Ebool_2EIN A.27a) V2x) V0P)) \wedge \\ & (p (ap V1f V2x)))))) \end{aligned}$$