

thm_2Ebool_2ELCOMM__THM
(TMW4e3oHb32tXrBuBC76WAeh4ptHbjbRuRB)

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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 $c_2Emin_2E_3D_3D_3E$ to be $\lambda P \in 2.\lambda Q \in 2.inj_o (p \Rightarrow q)$ of type ι .

Definition 3 We define c_2Ebool_2ET to be $(ap (ap (c_2Emin_2E_3D (2^2)) (\lambda V0x \in 2.V0x)) (\lambda V1x \in 2.V1x))$

Definition 4 We define $c_2Ebool_2E_21$ to be $\lambda A_27a : \iota.(\lambda V0P \in (2^{A_27a}).(ap (ap (c_2Emin_2E_3D (2^{A_27a})))$

Theorem 1

$$\begin{aligned} & \forall A_27a.nonempty A_27a \Rightarrow (\forall V0f \in ((A_27a^{A_27a})^{A_27a}). \\ & ((\forall V1x \in A_27a.(\forall V2y \in A_27a.(\forall V3z \in A_27a. \\ & ((ap (ap V0f V1x) (ap (ap V0f V2y) V3z))) = (ap (ap V0f (ap (ap V0f V1x) \\ & V2y)) V3z)))))) \Rightarrow ((\forall V4x \in A_27a.(\forall V5y \in A_27a.((ap \\ & (ap V0f V4x) V5y) = (ap (ap V0f V5y) V4x)))))) \Rightarrow (\forall V6x \in A_27a.(\\ & \forall V7y \in A_27a.(\forall V8z \in A_27a.((ap (ap V0f V6x) (ap (ap \\ & V0f V7y) V8z))) = (ap (ap V0f V7y) (ap (ap V0f V6x) V8z)))))))))) \end{aligned}$$