

thm_2Ebool_2EABS__REP__THM
(TMTDMtfrRUrx2dRJvZmxrrko8a4j555amkb)

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Definition 1 We define `c_2Emin_2E_40` to be $\lambda A.\lambda P \in 2^A.$ if $(\exists x \in A.p (ap P x))$ **then** (the $(\lambda x.x \in A \wedge p x)$ of type $\iota \Rightarrow \iota$).

Definition 2 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 3 We define `c_2Ebool_2E_3F` to be $\lambda A_27a : \iota.(\lambda V0P \in (2^{A_27a}).(ap V0P (ap (c_2Emin_2E_40 A_27a) V0P)))$

Definition 4 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 5 We define `c_2Ebool_2E_T` to be $(ap (ap (c_2Emin_2E_3D (2^2)) (\lambda V0x \in 2.V0x)) (\lambda V1x \in 2.V1x))$

Definition 6 We define `c_2Ebool_2E_21` to be $\lambda A_27a : \iota.(\lambda V0P \in (2^{A_27a}).(ap (ap (c_2Emin_2E_3D (2^{A_27a}) V0P) V0P)))$

Definition 7 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 8 We define `c_2Ebool_2E_TYPE_DEFINITION` to be $\lambda A_27a : \iota.\lambda A_27b : \iota.(\lambda V0P \in (2^{A_27a}).(\lambda V1rep \in (A_27b^{A_27a}).(ap (ap (c_2Ebool_2E_TYPE_DEFINITION A_27a A_27b) V0P) V1rep)))$

Assume the following.

$$(\forall V0t1 \in 2.(\forall V1t2 \in 2.(((p V0t1) \Rightarrow (p V1t2)) \Rightarrow (((p V1t2) \Rightarrow (p V0t1)) \Rightarrow ((p V0t1) \Leftrightarrow (p V1t2)))))) \quad (1)$$

Assume the following.

$$\forall A_27a.nonempty A_27a \Rightarrow \forall A_27b.nonempty A_27b \Rightarrow (\forall V0P \in (2^{A_27a}).(\forall V1rep \in (A_27b^{A_27a}).((p (ap (ap (c_2Ebool_2E_TYPE_DEFINITION A_27a A_27b) V0P) V1rep)) \Leftrightarrow ((\forall V2x_27 \in A_27b.(\forall V3x_27_27 \in A_27b.(((ap V1rep V2x_27) = (ap V1rep V3x_27_27)) \Rightarrow (V2x_27 = V3x_27_27)))) \wedge (\forall V4x \in A_27a.((p (ap V0P V4x)) \Leftrightarrow (\exists V5x_27 \in A_27b.(V4x = (ap V1rep V5x_27)))))))))))) \quad (2)$$

Theorem 1

$$\begin{aligned} & \forall A_{27a}.nonempty\ A_{27a} \Rightarrow \forall A_{27b}.nonempty\ A_{27b} \Rightarrow (\\ & \quad \forall V0P \in (2^{A_{27a}}).((\exists V1rep \in (A_{27a}^{A_{27b}}).(p\ (ap\ (\\ & ap\ (c_2Ebool_2ETYPE_DEFINITION\ A_{27a}\ A_{27b})\ V0P)\ V1rep))) \Rightarrow (\\ & \quad \exists V2rep \in (A_{27a}^{A_{27b}}).(\exists V3abs \in (A_{27b}^{A_{27a}}).((\\ & \quad \forall V4a \in A_{27b}.((ap\ V3abs\ (ap\ V2rep\ V4a)) = V4a)) \wedge (\forall V5r \in \\ & A_{27a}.((p\ (ap\ V0P\ V5r)) \Leftrightarrow ((ap\ V2rep\ (ap\ V3abs\ V5r)) = V5r))))))))) \end{aligned}$$