

thm_2EHolSmt_2ENOT__MEM__CONS (TMYN- JqdQRkmp1cuz26TmajngR5eZ2DwWKD7)

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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_2ET to be $(ap (ap (c_2Emin_2E_3D (2^2)) (\lambda V0x \in 2.V0x)) (\lambda V1x \in 2.V1x))$

Definition 3 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 4 We define c_2Ebool_2EF to be $(ap (c_2Ebool_2E_21 2) (\lambda V0t \in 2.V0t))$.

Definition 5 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 6 We define $c_2Ebool_2E_7E$ to be $(\lambda V0t \in 2.(ap (ap c_2Emin_2E_3D_3D_3E V0t) c_2Ebool_2EF$

Definition 7 We define $c_2Ebool_2E_5C_2F$ to be $(\lambda V0t1 \in 2.(\lambda V1t2 \in 2.(ap (c_2Ebool_2E_21 2) (\lambda V2t \in 2.V2t))$

Let $ty_2Elist_2Elist : \iota \Rightarrow \iota$ be given. Assume the following.

$$\forall A0.nonempty A0 \Rightarrow nonempty (ty_2Elist_2Elist A0) \quad (1)$$

Let $c_2Elist_2ECONS : \iota \Rightarrow \iota$ be given. Assume the following.

$$\forall A_27a.nonempty A_27a \Rightarrow c_2Elist_2ECONS A_27a \in (((ty_2Elist_2Elist A_27a)(ty_2Elist_2Elist A_27a))^{A_27a}) \quad (2)$$

Let $c_2Elist_2ENIL : \iota \Rightarrow \iota$ be given. Assume the following.

$$\forall A_27a.nonempty A_27a \Rightarrow c_2Elist_2ENIL A_27a \in (ty_2Elist_2Elist A_27a) \quad (3)$$

Let $c_2Elist_2ELIST_TO_SET : \iota \Rightarrow \iota$ be given. Assume the following.

$$\forall A_27a.nonempty A_27a \Rightarrow c_2Elist_2ELIST_TO_SET A_27a \in ((2^{A_27a})(ty_2Elist_2Elist A_27a)) \quad (4)$$

Definition 8 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 9 We define $c_2Ebool_2E_2F_5C$ to be $(\lambda V0t1 \in 2.(\lambda V1t2 \in 2.(ap (c_2Ebool_2E_21 2) (\lambda V2t \in 2.$

Assume the following.

$$True \tag{5}$$

Assume the following.

$$\forall A_27a.nonempty A_27a \Rightarrow (\forall V0t \in 2.((\forall V1x \in A_27a.(p V0t)) \Leftrightarrow (p V0t))) \tag{6}$$

Assume the following.

$$\forall A_27a.nonempty A_27a \Rightarrow (\forall V0x \in A_27a.((V0x = V0x) \Leftrightarrow True)) \tag{7}$$

Assume the following.

$$\forall A_27a.nonempty A_27a \Rightarrow (\forall V0x \in A_27a.(\forall V1y \in A_27a.((V0x = V1y) \Leftrightarrow (V1y = V0x)))) \tag{8}$$

Assume the following.

$$(\forall V0A \in 2.(\forall V1B \in 2.(((\neg((p V0A) \wedge (p V1B))) \Leftrightarrow ((\neg(p V0A) \vee \neg(p V1B)))) \wedge ((\neg((p V0A) \vee (p V1B))) \Leftrightarrow ((\neg(p V0A) \wedge \neg(p V1B)))))))) \tag{9}$$

Assume the following.

$$\forall A_27a.nonempty A_27a \Rightarrow ((\forall V0x \in A_27a.((p (ap (ap (c_2Ebool_2EIN A_27a) V0x) (ap (c_2Elist_2ELIST_TO_SET A_27a) (c_2Elist_2ENIL A_27a)))) \Leftrightarrow False)) \wedge (\forall V1x \in A_27a.(\forall V2h \in A_27a.(\forall V3t \in (ty_2Elist_2Elist A_27a).((p (ap (ap (c_2Ebool_2EIN A_27a) V1x) (ap (c_2Elist_2ELIST_TO_SET A_27a) (ap (ap (c_2Elist_2ECONS A_27a) V2h) V3t)))) \Leftrightarrow ((V1x = V2h) \vee (p (ap (ap (c_2Ebool_2EIN A_27a) V1x) (ap (c_2Elist_2ELIST_TO_SET A_27a) V3t)))))))))) \tag{10}$$

Theorem 1

$$\forall A_27a.nonempty A_27a \Rightarrow (\forall V0x \in A_27a.(\forall V1h \in A_27a.(\forall V2t \in (ty_2Elist_2Elist A_27a).((\neg(p (ap (ap (c_2Ebool_2EIN A_27a) V0x) (ap (c_2Elist_2ELIST_TO_SET A_27a) (ap (ap (c_2Elist_2ECONS A_27a) V1h) V2t)))) \Leftrightarrow ((\neg(V0x = V1h)) \wedge (\neg(p (ap (ap (c_2Ebool_2EIN A_27a) V0x) (ap (c_2Elist_2ELIST_TO_SET A_27a) V2t))))))))))$$