

thm_2Epred_set_2EBIGINTER_applied (TMT- NMRqu1owRxgatawYD7Rr38iZZzZ7PBtR)

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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 $c_2Emarker_2ECong$ to be $\lambda V0x \in 2.V0x$.

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_2EIN to be $\lambda A_27a : \iota.(\lambda V0x \in A_27a.(\lambda V1f \in (2^{A_27a}).(ap V1f V0x)))$

Definition 7 We define $c_2Ebool_2E_2F_5C$ to be $(\lambda V0t1 \in 2.(\lambda V1t2 \in 2.(ap (c_2Ebool_2E_21 2) (\lambda V2t \in 2.V2t)))$

Let $ty_2Epair_2Eprod : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Assume the following.

$$\forall A0.nonempty A0 \Rightarrow \forall A1.nonempty A1 \Rightarrow nonempty (ty_2Epair_2Eprod A0 A1) \tag{1}$$

Let $c_2Epair_2EABS_prod : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Assume the following.

$$\forall A_27a.nonempty A_27a \Rightarrow \forall A_27b.nonempty A_27b \Rightarrow c_2Epair_2EABS_prod A_27a A_27b \in ((ty_2Epair_2Eprod A_27a A_27b)^{(2^{A_27b})^{A_27a}}) \tag{2}$$

Definition 8 We define $c_2Epair_2E_2C$ to be $\lambda A_27a : \iota.\lambda A_27b : \iota.\lambda V0x \in A_27a.\lambda V1y \in A_27b.(ap (c_2Epair_2EABS_prod$

Let $c_2Epred_set_2EGSPEC : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Assume the following.

$$\forall A_27a.nonempty A_27a \Rightarrow \forall A_27b.nonempty A_27b \Rightarrow c_2Epred_set_2EGSPEC A_27a A_27b \in ((2^{A_27a})^{(ty_2Epair_2Eprod A_27a 2)^{A_27b}}) \tag{3}$$

Definition 9 We define $c_2Epred_set_2EBIGINTER$ to be $\lambda A_27a : \iota.\lambda V0P \in (2^{(2^{A_27a})}) .(ap (c_2Epred_set_2EGSPEC$

Assume the following.

$$\begin{aligned} & \forall A.27a.nonempty\ A.27a \Rightarrow (\forall V0x \in A.27a. (\forall V1B \in \\ & (2^{(2^{A-27a})}). ((p (ap (ap (c.2Ebool.2EIN\ A.27a)\ V0x) (ap (c.2Epred_set.2EBIGINTER \\ & A.27a)\ V1B))) \Leftrightarrow (\forall V2P \in (2^{A-27a}). ((p (ap (ap (c.2Ebool.2EIN \\ & (2^{A-27a})\ V2P)\ V1B)) \Rightarrow (p (ap (ap (c.2Ebool.2EIN\ A.27a)\ V0x)\ V2P))))))))) \end{aligned} \quad (4)$$

Theorem 1

$$\begin{aligned} & \forall A.27a.nonempty\ A.27a \Rightarrow (\forall V0B \in (2^{(2^{A-27a})}). (\forall V1x \in \\ & A.27a. ((p (ap (ap (c.2Epred_set.2EBIGINTER\ A.27a)\ V0B)\ V1x)) \Leftrightarrow \\ & (\forall V2P \in (2^{A-27a}). ((p (ap (ap (c.2Ebool.2EIN\ (2^{A-27a}) \\ & V2P)\ V0B)) \Rightarrow (p (ap (ap (c.2Ebool.2EIN\ A.27a)\ V1x)\ V2P))))))))) \end{aligned}$$