

thm_2Erelation_2ESTRORD__AND__NOT__Id
(TMT-
GUx5eqJQ4nwhg5bRoSXGywEtEmr8dnoC)

October 26, 2020

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

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

Definition 5 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 6 We define $c_2Erelation_2ERINTER$ to be $\lambda A_27a : \iota.\lambda A_27b : \iota.\lambda V0R1 \in ((2^{A_27b})^{A_27a}).\lambda V1R2 \in ((2^{A_27a})^{A_27b}).$

Definition 7 We define c_2Ebool_2EF to be $(ap (c_2Ebool_2E_21 2) (\lambda V0t \in 2.V0t))$.

Definition 8 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 9 We define $c_2Erelation_2ERCOMPL$ to be $\lambda A_27a : \iota.\lambda A_27b : \iota.\lambda V0R \in ((2^{A_27b})^{A_27a}).\lambda V1x \in A_27a.$

Definition 10 We define $c_2Erelation_2ESTRORD$ to be $\lambda A_27a : \iota.\lambda V0R \in ((2^{A_27a})^{A_27a}).\lambda V1a \in A_27a.$

Assume the following.

$$True \tag{1}$$

Assume the following.

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

Assume the following.

$$\forall A_27a.nonempty A_27a \Rightarrow (\forall V0x \in A_27a.((V0x = V0x) \Leftrightarrow True)) \tag{3}$$

Assume the following.

$$\begin{aligned} \forall A_{.27a}.nonempty\ A_{.27a} \Rightarrow \forall A_{.27b}.nonempty\ A_{.27b} \Rightarrow (\\ \forall V0f \in (A_{.27b}^{A_{.27a}}).(\forall V1g \in (A_{.27b}^{A_{.27a}}).((V0f = \\ V1g) \Leftrightarrow (\forall V2x \in A_{.27a}.((ap\ V0f\ V2x) = (ap\ V1g\ V2x)))))) \end{aligned} \quad (4)$$

Theorem 1

$$\begin{aligned} \forall A_{.27a}.nonempty\ A_{.27a} \Rightarrow (\forall V0R \in ((2^{A_{.27a}})^{A_{.27a}}). \\ ((ap\ (c_2Erelation_2ESTRORD\ A_{.27a})\ V0R) = (ap\ (ap\ (c_2Erelation_2ERINTER \\ A_{.27a}\ A_{.27a})\ V0R)\ (ap\ (c_2Erelation_2ERCOMPL\ A_{.27a}\ A_{.27a})\ (c_2Emin_2E_3D \\ A_{.27a})))))) \end{aligned}$$