

thm_2Equotient_2ERESPECTS_THM (TMGse- Jmhoi8bUzhB4NSkTLhX6NeM5savNcQ)

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

Definition 4 We define $c_2Ebool_2E_21$ to be $\lambda A_27a : \iota.(\lambda V0P \in (2^{A-27a}).(ap (ap (c_2Emin_2E_3D (2^{A-27a})) (\lambda V1P \in 2.V1P)) (\lambda V2P \in 2.V2P))$

Definition 5 We define $c_2Equotient_2E_3D_3D_3D_3E$ to be $\lambda A_27a : \iota.\lambda A_27b : \iota.\lambda V0R1 \in ((2^{A-27a})^{A-27a})$

Definition 6 We define $c_2Ecombin_2EW$ to be $\lambda A_27a : \iota.\lambda A_27b : \iota.(\lambda V0f \in ((A_27b^{A-27a})^{A-27a}).(\lambda V1x \in A_27a.((ap (ap (c_2Emin_2E_3D (2^{A-27a})) (\lambda V2x \in 2.V2x)) (\lambda V3x \in 2.V3x))$

Definition 7 We define $c_2Equotient_2ERespects$ to be $\lambda A_27a : \iota.\lambda A_27b : \iota.(c_2Ecombin_2EW A_27a A_27b)$

Assume the following.

$$True \tag{1}$$

Assume the following.

$$\forall A_27a.nonempty A_27a \Rightarrow (\forall V0x \in A_27a.((V0x = V0x) \Leftrightarrow True)) \tag{2}$$

Assume the following.

$$\begin{aligned} & \forall A_27a.nonempty A_27a \Rightarrow \forall A_27b.nonempty A_27b \Rightarrow (\\ & \quad \forall V0f \in ((A_27b^{A-27a})^{A-27a}).(\forall V1x \in A_27a.((ap (ap (c_2Emin_2E_3D (2^{A-27a})) (\lambda V2x \in 2.V2x)) (\lambda V3x \in 2.V3x)) \\ & \quad (c_2Ecombin_2EW A_27a A_27b) V0f) V1x) = (ap (ap V0f V1x) V1x)))) \end{aligned} \tag{3}$$

Theorem 1

$$\begin{aligned} & \forall A_27a.nonempty A_27a \Rightarrow \forall A_27b.nonempty A_27b \Rightarrow (\\ & \quad \forall V0R1 \in ((2^{A-27a})^{A-27a}).(\forall V1R2 \in ((2^{A-27b})^{A-27b}). \\ & \quad (\forall V2f \in (A_27b^{A-27a}).((p (ap (ap (c_2Equotient_2ERespects \\ & \quad (A_27b^{A-27a}) 2) (ap (ap (c_2Equotient_2E_3D_3D_3D_3E A_27a A_27b) \\ & \quad V0R1) V1R2)) V2f)) \Leftrightarrow (\forall V3x \in A_27a.(\forall V4y \in A_27a.((\\ & \quad p (ap (ap V0R1 V3x) V4y)) \Rightarrow (p (ap (ap V1R2 (ap V2f V3x)) (ap V2f V4y)))))))))) \end{aligned}$$