

thm_2Erelation_2EIDEM (TMJ3yxUYWzthNmsEs2jUCFffFzcL4d3oNu2j)

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Definition 1 We define `c_2Emin_2E_3D` to be $\lambda A. \lambda x \in A. \lambda y \in A. \text{inj_o } (x = y)$ of type $\iota \Rightarrow \iota$.

Definition 2 We define `c_2Ebool_2E_21` to be $(\text{ap } (\text{ap } (\text{c_2Emin_2E_3D } (2^2)) (\lambda V0x \in 2. V0x)) (\lambda V1x \in 2. V1x))$

Definition 3 We define `c_2Ebool_2E_21` to be $\lambda A. 27a : \iota. (\lambda V0P \in (2^{A-27a}). (\text{ap } (\text{ap } (\text{c_2Emin_2E_3D } (2^{A-27a}))))$

Definition 4 We define `c_2Ecombin_2Eo` to be $\lambda A. 27a : \iota. \lambda A. 27b : \iota. \lambda A. 27c : \iota. \lambda V0f \in (A. 27b^{A-27c}). \lambda V1g$

Definition 5 We define `c_2Erelation_2EIDEM` to be $\lambda A. 27z : \iota. \lambda V0f \in (A. 27z^{A-27z}). (\text{ap } (\text{ap } (\text{c_2Emin_2E_3D } (2^{A-27z}))))$

Assume the following.

$$\text{True} \tag{1}$$

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$$\forall A. 27a. \text{nonempty } A. 27a \Rightarrow (\forall V0x \in A. 27a. ((V0x = V0x) \Leftrightarrow \text{True})) \tag{2}$$

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$$\forall A. 27a. \text{nonempty } A. 27a \Rightarrow \forall A. 27b. \text{nonempty } A. 27b \Rightarrow (\forall V0f \in (A. 27b^{A-27a}). (\forall V1g \in (A. 27b^{A-27a}). ((V0f = V1g) \Leftrightarrow (\forall V2x \in A. 27a. ((\text{ap } V0f } V2x) = (\text{ap } V1g } V2x)))))) \tag{3}$$

Assume the following.

$$\forall A. 27a. \text{nonempty } A. 27a \Rightarrow \forall A. 27b. \text{nonempty } A. 27b \Rightarrow \forall A. 27c. \text{nonempty } A. 27c \Rightarrow (\forall V0f \in (A. 27b^{A-27a}). (\forall V1g \in (A. 27a^{A-27c}). (\forall V2x \in A. 27c. ((\text{ap } (\text{ap } (\text{ap } (\text{c_2Ecombin_2Eo } A. 27c } A. 27b } A. 27a) V0f) V1g) V2x) = (\text{ap } V0f } (\text{ap } V1g } V2x)))))) \tag{4}$$

Theorem 1

$$\forall A. 27z. \text{nonempty } A. 27z \Rightarrow (\forall V0f \in (A. 27z^{A-27z}). ((\text{ap } (\text{c_2Erelation_2EIDEM } A. 27z) V0f) \Leftrightarrow (\forall V1x \in A. 27z. ((\text{ap } V0f } (\text{ap } V0f } V1x)) = (\text{ap } V0f } V1x))))))$$