thm_2Ecombin_2EGEN__literal__case__RAND (TMZCvMw3Jhow5pS3wUCdpRMeabw4zZVh6uo)

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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* $(ap\ (ap\ (\mathsf{c_2Emin_2E_3D}\ (2^2))\ (\lambda V0x \in 2.V0x))\ (\lambda V1x \in 2.V1$

Definition 3 *We define* c_2Ebool_2Eliteral__case *to be* $\lambda A_27a : \iota.\lambda A_27b : \iota.(\lambda V0f \in (A_27b^{A_27a}).(\lambda V1x \in$

Definition 4 *We define* c_2Ebool_2E_21 *to be* $\lambda A_27a : \iota.(\lambda V0P \in (2^{A_27a}).(ap\ (ap\ (\mathsf{c_2Emin_2E_3D}\ (2^{A_27}$

Definition 5 *We define* c_2Ecombin_2Eo *to be* $\lambda A_27a : \iota.\lambda A_27b : \iota.\lambda A_27c : \iota.\lambda V0f \in (A_27b^{A_27c}).\lambda V1g$

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.

$$\forall A_27a.nonempty\ A_27a \Rightarrow \forall A_27b.nonempty\ A_27b \Rightarrow (\forall V0f \in (A_27b^{A_27a}).(\forall V1x \in A_27a.((ap\ (ap\ (\mathsf{c_2Ebool_2Eliteral__case}\ A_27a\ A_27b)\ V0f)\ V1x) = (ap\ V0f\ V1x)))) \tag{3}$$

Assume the following.

$$\forall A_27a.nonempty\ A_27a \Rightarrow \forall A_27b.nonempty\ A_27b \Rightarrow \forall A_27c.nonempty\ A_27c \Rightarrow (\forall V0f \in (A_27b^{A_27a}).(\forall V1g \in (A_27a^{A_27c}).(\forall V2x \in A_27c.((ap\ (ap\ (ap\ (\mathsf{c_2Ecombin_2Eo}\ A_27c\ A_27b\ A_27a)\ V0f)\ V1g)\ V2x) = (ap\ V0f\ (ap\ V1g\ V2x)))))) \tag{4}$$

Theorem 1

$$\forall A_27a.nonempty\ A_27a \Rightarrow \forall A_27b.nonempty\ A_27b \Rightarrow \forall A_27c.nonempty\ A_27c \Rightarrow (\forall V0P \in (A_27a^{A_27b}).(\forall V1f \in (A_27b^{A_27c}).(\forall V2v \in A_27c.((ap\ V0P\ (ap\ (ap\ (\mathsf{c_2Ebool_2Eliteral__case}\ A_27c\ A_27b)\ V1f)\ V2v)) = (ap\ (ap\ (\mathsf{c_2Ebool_2Eliteral__case}\ A_27c\ A_27a)\ (ap\ (ap\ (\mathsf{c_2Ecombin_2Eo}\ A_27c\ A_27a\ A_27b)\ V0P)\ V1f))\ V2v)))))$$