

thm_2Earithmetic_2Edatatype__num (TMU6NqBMTvbEyovpNwBFfourpChb1sbdjbX)

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Let $ty_2Enum_2Enum : \iota$ be given. Assume the following.

$$nonempty\ ty_2Enum_2Enum \tag{1}$$

Let $c_2Enum_2EREP_num : \iota$ be given. Assume the following.

$$c_2Enum_2EREP_num \in (\omega^{ty_2Enum_2Enum}) \tag{2}$$

Let $c_2Enum_2ESUC_REP : \iota$ be given. Assume the following.

$$c_2Enum_2ESUC_REP \in (\omega^{\omega}) \tag{3}$$

Let $c_2Enum_2EABS_num : \iota$ be given. Assume the following.

$$c_2Enum_2EABS_num \in (ty_2Enum_2Enum^{\omega}) \tag{4}$$

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 $\lambda A.\lambda a : \iota.(\lambda V0P \in (2^{A-27a}).(ap (ap (c_2Emin_2E_3D (2^{A-27a}))$

Definition 4 We define c_2Enum_2ESUC to be $\lambda V0m \in ty_2Enum_2Enum.(ap c_2Enum_2EABS_num ($

Let $c_2Enum_2EZERO_REP : \iota$ be given. Assume the following.

$$c_2Enum_2EZERO_REP \in \omega \tag{5}$$

Definition 5 We define c_2Enum_2E0 to be $(ap c_2Enum_2EABS_num c_2Enum_2EZERO_REP)$.

Definition 6 We define $c_2Ebool_2EDATATYPE$ to be $\lambda A.\lambda a : \iota.(\lambda V0x \in A.\lambda a.c_2Ebool_2ET)$.

Assume the following.

$$True \tag{6}$$

Assume the following.

$$\forall A.\lambda a.nonempty\ A.\lambda a \Rightarrow (\forall V0x \in A.\lambda a.((p (ap (c_2Ebool_2EDATATYPE A.\lambda a) V0x)) \Leftrightarrow True)) \tag{7}$$

Theorem 1

$\forall A_27a.nonempty\ A_27a \Rightarrow (\forall V0num \in ((A_27a^{(ty_2Enum_2Enum^{ty_2Enum_2Enum})})_{ty_2Enum_2Enum}).$
 $(p\ (ap\ (c_2Ebool_2EDATATYPE\ A_27a)\ (ap\ (ap\ V0num\ c_2Enum_2E0)\ c_2Enum_2ESUC))))$