

thm_2Enumeral_2Enumeral_evenodd (TMX- ubF9D4NShnFPv8BQoLzpmUWhcWyTcDNo)

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

$$c_2Enum_2EZERO_REP \in \omega \tag{1}$$

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

$$nonempty\ ty_2Enum_2Enum \tag{2}$$

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

$$c_2Enum_2EABS_num \in (ty_2Enum_2Enum^{\omega}) \tag{3}$$

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_2Enum_2E0 to be $(ap\ c_2Enum_2EABS_num\ c_2Enum_2EZERO_REP)$.

Definition 3 We define $c_2Earithmetic_2EZERO$ to be c_2Enum_2E0 .

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

$$c_2Enum_2EREP_num \in (\omega^{ty_2Enum_2Enum}) \tag{4}$$

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

$$c_2Enum_2ESUC_REP \in (\omega^{\omega}) \tag{5}$$

Definition 4 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 5 We define $c_2Ebool_2E_21$ to be $\lambda A.\lambda a : \iota.(\lambda V0P \in (2^{A-27a}).(ap\ (ap\ (c_2Emin_2E_3D\ (2^{A-27a}))\ (\lambda V1x \in 2.V1x))\ (\lambda V1x \in 2.V1x)))$

Definition 6 We define c_2Enum_2ESUC to be $\lambda V0m \in ty_2Enum_2Enum.(ap\ c_2Enum_2EABS_num\ (ap\ (ap\ (c_2Emin_2E_3D\ (2^2))\ (\lambda V0x \in 2.V0x))\ (\lambda V1x \in 2.V1x))))$

Let $c_2Earithmetic_2E_2B : \iota$ be given. Assume the following.

$$c_2Earithmetic_2E_2B \in ((ty_2Enum_2Enum^{ty_2Enum_2Enum})^{ty_2Enum_2Enum}) \tag{6}$$

Definition 7 We define $c_2Earithmetic_2EBIT1$ to be $\lambda V0n \in ty_2Enum_2Enum.(ap (ap c_2Earithmetic_2EBIT1 V0n) V0n)$

Definition 8 We define $c_2Earithmetic_2EBIT2$ to be $\lambda V0n \in ty_2Enum_2Enum.(ap (ap c_2Earithmetic_2EBIT2 V0n) V0n)$

Let $c_2Earithmetic_2EEVEN : \iota$ be given. Assume the following.

$$c_2Earithmetic_2EEVEN \in (2^{ty_2Enum_2Enum}) \quad (7)$$

Let $c_2Earithmetic_2EODD : \iota$ be given. Assume the following.

$$c_2Earithmetic_2EODD \in (2^{ty_2Enum_2Enum}) \quad (8)$$

Definition 9 We define c_2Ebool_2EF to be $(ap (c_2Ebool_2E21 2) (\lambda V0t \in 2.V0t))$.

Definition 10 We define $c_2Emin_2E3D_3D_3E$ to be $\lambda P \in 2.\lambda Q \in 2.inj_o (p P \Rightarrow p Q)$ of type ι .

Definition 11 We define c_2Ebool_2E7E to be $(\lambda V0t \in 2.(ap (ap c_2Emin_2E3D_3D_3E V0t) c_2Ebool_2E21 2) V0t)$

Definition 12 We define $c_2Ebool_2E2F_5C$ to be $(\lambda V0t1 \in 2.(\lambda V1t2 \in 2.(ap (c_2Ebool_2E21 2) (\lambda V2t \in 2.V2t) V1t2) V0t1))$

Assume the following.

$$\begin{aligned} &(((p (ap c_2Earithmetic_2EEVEN c_2Enum_2E0)) \Leftrightarrow True) \wedge (\forall V0n \in \\ &ty_2Enum_2Enum.((p (ap c_2Earithmetic_2EEVEN (ap c_2Enum_2ESUC \\ &V0n))) \Leftrightarrow \neg(p (ap c_2Earithmetic_2EEVEN V0n)))))) \end{aligned} \quad (9)$$

Assume the following.

$$\begin{aligned} &(((p (ap c_2Earithmetic_2EODD c_2Enum_2E0)) \Leftrightarrow False) \wedge (\forall V0n \in \\ &ty_2Enum_2Enum.((p (ap c_2Earithmetic_2EODD (ap c_2Enum_2ESUC \\ &V0n))) \Leftrightarrow \neg(p (ap c_2Earithmetic_2EODD V0n)))))) \end{aligned} \quad (10)$$

Assume the following.

$$\begin{aligned} &(\forall V0m \in ty_2Enum_2Enum.(\forall V1n \in ty_2Enum_2Enum.(\\ &((ap (ap c_2Earithmetic_2E_2B c_2Enum_2E0) V0m) = V0m) \wedge (((ap (\\ &ap c_2Earithmetic_2E_2B V0m) c_2Enum_2E0) = V0m) \wedge (((ap (ap c_2Earithmetic_2E_2B \\ &(ap c_2Enum_2ESUC V0m)) V1n) = (ap c_2Enum_2ESUC (ap (ap c_2Earithmetic_2E_2B \\ &V0m) V1n))) \wedge ((ap (ap c_2Earithmetic_2E_2B V0m) (ap c_2Enum_2ESUC \\ &V1n)) = (ap c_2Enum_2ESUC (ap (ap c_2Earithmetic_2E_2B V0m) V1n)))))))))) \end{aligned} \quad (11)$$

Assume the following.

$$\begin{aligned} &(\forall V0m \in ty_2Enum_2Enum.(\forall V1n \in ty_2Enum_2Enum.(\\ &(p (ap c_2Earithmetic_2EEVEN (ap (ap c_2Earithmetic_2E_2B V0m) \\ &V1n))) \Leftrightarrow ((p (ap c_2Earithmetic_2EEVEN V0m)) \Leftrightarrow (p (ap c_2Earithmetic_2EEVEN \\ &V1n)))))) \end{aligned} \quad (12)$$

Assume the following.

$$\begin{aligned}
& (\forall V0m \in ty_2Enum_2Enum. (\forall V1n \in ty_2Enum_2Enum. (\\
& \quad (p (ap c_2Earithmetic_2EODD (ap (ap c_2Earithmetic_2E_2B V0m) \\
& \quad V1n))) \Leftrightarrow (\neg((p (ap c_2Earithmetic_2EODD V0m)) \Leftrightarrow (p (ap c_2Earithmetic_2EODD \\
& \quad V1n))))))
\end{aligned} \tag{13}$$

Assume the following.

$$True \tag{14}$$

Assume the following.

$$\forall A_27a.nonempty A_27a \Rightarrow (\forall V0t \in 2. ((\forall V1x \in A_27a.(p V0t)) \Leftrightarrow (p V0t))) \tag{15}$$

Assume the following.

$$\begin{aligned}
& (\forall V0t \in 2. (((True \wedge (p V0t)) \Leftrightarrow (p V0t)) \wedge (((p V0t) \wedge True) \Leftrightarrow \\
& (p V0t)) \wedge (((False \wedge (p V0t)) \Leftrightarrow False) \wedge (((p V0t) \wedge False) \Leftrightarrow False) \wedge \\
& (((p V0t) \wedge (p V0t)) \Leftrightarrow (p V0t))))))
\end{aligned} \tag{16}$$

Assume the following.

$$\begin{aligned}
& ((\forall V0t \in 2. ((\neg(\neg(p V0t))) \Leftrightarrow (p V0t))) \wedge ((\neg True) \Leftrightarrow False) \wedge \\
& ((\neg False) \Leftrightarrow True))
\end{aligned} \tag{17}$$

Assume the following.

$$\forall A_27a.nonempty A_27a \Rightarrow (\forall V0x \in A_27a. ((V0x = V0x) \Leftrightarrow True)) \tag{18}$$

Theorem 1

$$\begin{aligned}
& (\forall V0n \in ty_2Enum_2Enum. ((p (ap c_2Earithmetic_2EVEN c_2Earithmetic_2EZERO)) \wedge \\
& \quad ((p (ap c_2Earithmetic_2EVEN (ap c_2Earithmetic_2EBIT2 V0n))) \wedge \\
& \quad (\neg(p (ap c_2Earithmetic_2EVEN (ap c_2Earithmetic_2EBIT1 V0n)))))) \wedge \\
& \quad ((\neg(p (ap c_2Earithmetic_2EODD c_2Earithmetic_2EZERO))) \wedge ((\\
& \quad \neg(p (ap c_2Earithmetic_2EODD (ap c_2Earithmetic_2EBIT2 V0n)))))) \wedge \\
& \quad (p (ap c_2Earithmetic_2EODD (ap c_2Earithmetic_2EBIT1 V0n))))))
\end{aligned}$$