thm_2EASCIInumbers_2EUNHEX__HEX (TMNp6SGQFudTywJnNhTj5TdiepkctemwQbr)

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Let $ty\_2Estring\_2Echar : \iota$ be given. Assume the following.

$$nonempty\ ty\_2Estring\_2Echar \tag{1}$$

Let $c\_2Ebool\_2EARB : \iota \Rightarrow \iota$ be given. Assume the following.

$$\forall A\_27a.nonempty\ A\_27a \Rightarrow c\_2Ebool\_2EARB\ A\_27a \in A\_27a \tag{2}$$

Let $c\_2Enum\_2EZERO\_\_REP : \iota$ be given. Assume the following.

$$c\_2Enum\_2EZERO\_\_REP \in omega \tag{3}$$

Let $ty\_2Enum\_2Enum : \iota$ be given. Assume the following.

$$nonempty\ ty\_2Enum\_2Enum \tag{4}$$

Let $c\_2Enum\_2EABS\_\_num : \iota$ be given. Assume the following.

$$c\_2Enum\_2EABS\_\_num \in (ty\_2Enum\_2Enum^{omega}) \tag{5}$$

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.

$$c\_2Enum\_2EREP\_\_num \in (omega^{ty\text{-}2Enum\_2Enum}) \tag{6}$$

Let $c\_2Enum\_2ESUC\_\_REP : \iota$ be given. Assume the following.

$$c\_2Enum\_2ESUC\_\_REP \in (omega^{omega}) \tag{7}$$

Definition 4 *We define* c_2Ebool_2ET *to be* $(ap\ (ap\ ($c_2Emin_2E_3D$\ (2^2))\ (\lambda V0x \in 2.V0x))\ (\lambda V1x \in 2.V1$

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Definition 5 *We define* c_2Ebool_2E_21 *to be* $\lambda A\_27a : \iota.(\lambda V0P \in (2^{A\_27a}).(ap\ (ap\ ($c_2Emin_2E_3D$\ (2^{A\_27}$

Definition 6 *We define* c_2Enum_2ESUC *to be* $\lambda V0m \in ty\_2Enum\_2Enum.(ap\ c\_2Enum\_2EABS\_\_num\ ($

Let $c\_2Earithmetic\_2E\_2B : \iota$ be given. Assume the following.

$$c\_2Earithmetic\_2E\_2B \in ((ty\_2Enum\_2Enum^{ty\_2Enum\_2Enum})^{ty\_2Enum\_2Enum})$$
(8)

Definition 7 *We define* c_2Earithmetic_2EBIT1 *to be* $\lambda V0n \in ty\_2Enum\_2Enum.(ap\ (ap\ c\_2Earithmetic\_2$

Definition 8 *We define* c_2Earithmetic_2EBIT2 *to be* $\lambda V0n \in ty\_2Enum\_2Enum.(ap\ (ap\ c\_2Earithmetic\_2$

Definition 9 *We define* c_2Earithmetic_2ENUMERAL *to be* $\lambda V0x \in ty\_2Enum\_2Enum.V0x.$

Let $c\_2Estring\_2ECHR : \iota$ be given. Assume the following.

$$c\_2Estring\_2ECHR \in (ty\_2Estring\_2Echar^{ty\_2Enum\_2Enum})$$
(9)

Definition 10 *We define* c_2Ecombin_2EK *to be* $\lambda A\_27a : \iota.\lambda A\_27b : \iota.(\lambda V0x \in A\_27a.(\lambda V1y \in A\_27b.V0x)$

Definition 11 *We define* c_2Ecombin_2ES *to be* $\lambda A\_27a : \iota.\lambda A\_27b : \iota.\lambda A\_27c : \iota.(\lambda V0f \in ((A\_27c^{A\_27b})^{A\_27}$

Definition 12 *We define* c_2Ecombin_2EI *to be* $\lambda A\_27a : \iota.(ap\ (ap\ ($c_2Ecombin_2ES$\ A\_27a\ (A\_27a^{A\_27a})\ A$

Definition 13 *We define* c_2Ebool_2EF *to be* $(ap\ ($c_2Ebool_2E_21$\ 2)\ (\lambda V0t \in 2.V0t)).$

Definition 14 *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 15 *We define* c_2Ebool_2E_2F_5C *to be* $(\lambda V0t1 \in 2.(\lambda V1t2 \in 2.(ap\ ($c_2Ebool_2E_21$\ 2)\ (\lambda V2t \in$

Definition 16 *We define* c_2Emin_2E_40 *to be* $\lambda A.\lambda P \in 2^A.$**if** $(\exists x \in A.p\ (ap\ P\ x))$ **then** $(the\ (\lambda x.x \in A \wedge p$
of type $\iota{\Rightarrow}\iota$.

Definition 17 *We define* c_2Ebool_2ECOND *to be* $\lambda A\_27a : \iota.(\lambda V0t \in 2.(\lambda V1t1 \in A\_27a.(\lambda V2t2 \in A\_27a.($

Definition 18 *We define* c_2Ebool_2Eliteral__case *to be* $\lambda A\_27a : \iota.\lambda A\_27b : \iota.(\lambda V0f \in (A\_27b^{A\_27a}).(\lambda V1x$

Definition 19 *We define* c_2Ebool_2E_7E *to be* $(\lambda V0t \in 2.(ap\ (ap\ $c_2Emin_2E_3D_3D_3E$\ V0t)\ c_2Ebool_2E

Definition 20 *We define* c_2Ebool_2E_3F *to be* $\lambda A\_27a : \iota.(\lambda V0P \in (2^{A\_27a}).(ap\ V0P\ (ap\ ($c_2Emin_2E_40$

Definition 21 *We define* c_2Erelation_2EWF *to be* $\lambda A\_27a : \iota.\lambda V0R \in ((2^{A\_27a})^{A\_27a}).(ap\ ($c_2Ebool_2E_21$

Definition 22 *We define* c_2Erelation_2ERESTRICT *to be* $\lambda A\_27a : \iota.\lambda A\_27b : \iota.\lambda V0f \in (A\_27b^{A\_27a}).\lambda V1$

Definition 23 *We define* c_2Erelation_2ETC *to be* $\lambda A\_27a : \iota.\lambda V0R \in ((2^{A\_27a})^{A\_27a}).\lambda V1a \in A\_27a.\lambda V2b$

Definition 24 *We define* c_2Erelation_2Eapprox *to be* $\lambda A\_27a : \iota.\lambda A\_27b : \iota.\lambda V0R \in ((2^{A\_27a})^{A\_27a}).\lambda V1M$

Definition 25 *We define* c_2Erelation_2Ethe__fun *to be* $\lambda A\_27a : \iota.\lambda A\_27b : \iota.\lambda V0R \in ((2^{A\_27a})^{A\_27a}).\lambda V1M$

Definition 26 *We define* c_2Erelation_2EWFREC *to be* $\lambda A\_27a : \iota.\lambda A\_27b : \iota.\lambda V0R \in ((2^{A\_27a})^{A\_27a}).\lambda V1M$

Definition 27 *We define* c_2EASCIInumbers_2EHEX *to be* $(ap\ (ap\ ($c_2Erelation_2EWFREC ty_2Enum_2E

Definition 28 *We define* c_2EASCIInumbers_2EUNHEX *to be* $(ap\ (ap\ ($c_2Erelation_2EWFREC $ty\_2Estring$

Let $c\_2Earithmetic\_2EEVEN : \iota$ be given. Assume the following.

$$c\_2Earithmetic\_2EEVEN \in (2^{ty\_2Enum\_2Enum}) \qquad (10)$$

Let $c\_2Earithmetic\_2EODD : \iota$ be given. Assume the following.

$$c\_2Earithmetic\_2EODD \in (2^{ty\_2Enum\_2Enum}) \qquad (11)$$

Definition 29 *We define* c_2Eprim__rec_2E_3C *to be* $\lambda V0m \in ty\_2Enum\_2Enum.\lambda V1n \in ty\_2Enum\_2Enu$

Definition 30 *We define* c_2Earithmetic_2E_3E *to be* $\lambda V0m \in ty\_2Enum\_2Enum.\lambda V1n \in ty\_2Enum\_2En$

Definition 31 *We define* c_2Ebool_2E_5C_2F *to be* $(\lambda V0t1 \in 2.(\lambda V1t2 \in 2.(ap\ ($c_2Ebool_2E_21 $2)\ (\lambda V2t \in$

Definition 32 *We define* c_2Earithmetic_2E_3E_3D *to be* $\lambda V0m \in ty\_2Enum\_2Enum.\lambda V1n \in ty\_2Enum\_2$

Definition 33 *We define* c_2Earithmetic_2E_3C_3D *to be* $\lambda V0m \in ty\_2Enum\_2Enum.\lambda V1n \in ty\_2Enum\_2$

Definition 34 *We define* c_2Eprim__rec_2EPRE *to be* $\lambda V0m \in ty\_2Enum\_2Enum.(ap\ (ap\ (ap\ ($c_2Ebool_2E

Let $c\_2Earithmetic\_2EEXP : \iota$ be given. Assume the following.

$$c\_2Earithmetic\_2EEXP \in ((ty\_2Enum\_2Enum^{ty\_2Enum\_2Enum})^{ty\_2Enum\_2Enum})$$
$$(12)$$

Let $c\_2Earithmetic\_2E\_2A : \iota$ be given. Assume the following.

$$c\_2Earithmetic\_2E\_2A \in ((ty\_2Enum\_2Enum^{ty\_2Enum\_2Enum})^{ty\_2Enum\_2Enum})$$
$$(13)$$

Definition 35 *We define* c_2Enumeral_2EiZ *to be* $\lambda V0x \in ty\_2Enum\_2Enum.V0x.$

Let $c\_2Enumeral\_2EiSUB : \iota$ be given. Assume the following.

$$c\_2Enumeral\_2EiSUB \in (((ty\_2Enum\_2Enum^{ty\_2Enum\_2Enum})^{ty\_2Enum\_2Enum})^2)$$
$$(14)$$

Let $c\_2Earithmetic\_2E\_2D : \iota$ be given. Assume the following.

$$c\_2Earithmetic\_2E\_2D \in ((ty\_2Enum\_2Enum^{ty\_2Enum\_2Enum})^{ty\_2Enum\_2Enum})$$
$$(15)$$

Definition 36 *We define* c_2Enumeral_2EiDUB *to be* $\lambda V0x \in ty\_2Enum\_2Enum.(ap\ (ap\ c\_2Earithmetic\_2$

Assume the following.

$$(((ap \text{ c\_2EASCIInumbers\_2EHEX c\_2Enum\_2E0}) = (ap \ c\_2Estring\_2ECHR$$
$$(ap \text{ c\_2Earithmetic\_2ENUMERAL } (ap \text{ c\_2Earithmetic\_2EBIT2 } (ap \text{ c\_2Earithmetic\_2EBIT1}$$
$$(ap \text{ c\_2Earithmetic\_2EBIT1 } (ap \text{ c\_2Earithmetic\_2EBIT1 } (ap \text{ c\_2Earithmetic\_2EBIT2}$$
$$\text{c\_2Earithmetic\_2EZERO}))))))))) \wedge (((ap \text{ c\_2EASCIInumbers\_2EHEX}$$
$$(ap \text{ c\_2Earithmetic\_2ENUMERAL } (ap \text{ c\_2Earithmetic\_2EBIT1 c\_2Earithmetic\_2EZERO}))) =$$
$$(ap \ c\_2Estring\_2ECHR \ (ap \text{ c\_2Earithmetic\_2ENUMERAL } (ap \text{ c\_2Earithmetic\_2EBIT1}$$
$$(ap \text{ c\_2Earithmetic\_2EBIT2 } (ap \text{ c\_2Earithmetic\_2EBIT1 } (ap \text{ c\_2Earithmetic\_2EBIT1}$$
$$(ap \text{ c\_2Earithmetic\_2EBIT2 c\_2Earithmetic\_2EZERO})))))))) \wedge ($$
$$((ap \text{ c\_2EASCIInumbers\_2EHEX } (ap \text{ c\_2Earithmetic\_2ENUMERAL } (ap$$
$$\text{c\_2Earithmetic\_2EBIT2 c\_2Earithmetic\_2EZERO}))) = (ap \ c\_2Estring\_2ECHR$$
$$(ap \text{ c\_2Earithmetic\_2ENUMERAL } (ap \text{ c\_2Earithmetic\_2EBIT2 } (ap \text{ c\_2Earithmetic\_2EBIT2}$$
$$(ap \text{ c\_2Earithmetic\_2EBIT1 } (ap \text{ c\_2Earithmetic\_2EBIT1 } (ap \text{ c\_2Earithmetic\_2EBIT2}$$
$$\text{c\_2Earithmetic\_2EZERO}))))))))) \wedge (((ap \text{ c\_2EASCIInumbers\_2EHEX}$$
$$(ap \text{ c\_2Earithmetic\_2ENUMERAL } (ap \text{ c\_2Earithmetic\_2EBIT1 } (ap \text{ c\_2Earithmetic\_2EBIT1}$$
$$\text{c\_2Earithmetic\_2EZERO})))) = (ap \ c\_2Estring\_2ECHR \ (ap \text{ c\_2Earithmetic\_2ENUMERAL}$$
$$(ap \text{ c\_2Earithmetic\_2EBIT1 } (ap \text{ c\_2Earithmetic\_2EBIT1 } (ap \text{ c\_2Earithmetic\_2EBIT2}$$
$$(ap \text{ c\_2Earithmetic\_2EBIT1 } (ap \text{ c\_2Earithmetic\_2EBIT2 c\_2Earithmetic\_2EZERO})))))))) \wedge$$
$$(((ap \text{ c\_2EASCIInumbers\_2EHEX } (ap \text{ c\_2Earithmetic\_2ENUMERAL } ($$
$$ap \text{ c\_2Earithmetic\_2EBIT2 } (ap \text{ c\_2Earithmetic\_2EBIT1 c\_2Earithmetic\_2EZERO})))) =$$
$$(ap \ c\_2Estring\_2ECHR \ (ap \text{ c\_2Earithmetic\_2ENUMERAL } (ap \text{ c\_2Earithmetic\_2EBIT2}$$
$$(ap \text{ c\_2Earithmetic\_2EBIT1 } (ap \text{ c\_2Earithmetic\_2EBIT2 } (ap \text{ c\_2Earithmetic\_2EBIT1}$$
$$(ap \text{ c\_2Earithmetic\_2EBIT2 c\_2Earithmetic\_2EZERO})))))))) \wedge ($$
$$((ap \text{ c\_2EASCIInumbers\_2EHEX } (ap \text{ c\_2Earithmetic\_2ENUMERAL } (ap$$
$$\text{c\_2Earithmetic\_2EBIT1 } (ap \text{ c\_2Earithmetic\_2EBIT2 c\_2Earithmetic\_2EZERO})))) =$$
$$(ap \ c\_2Estring\_2ECHR \ (ap \text{ c\_2Earithmetic\_2ENUMERAL } (ap \text{ c\_2Earithmetic\_2EBIT1}$$
$$(ap \text{ c\_2Earithmetic\_2EBIT2 } (ap \text{ c\_2Earithmetic\_2EBIT2 } (ap \text{ c\_2Earithmetic\_2EBIT1}$$
$$(ap \text{ c\_2Earithmetic\_2EBIT2 c\_2Earithmetic\_2EZERO})))))))) \wedge ($$
$$((ap \text{ c\_2EASCIInumbers\_2EHEX } (ap \text{ c\_2Earithmetic\_2ENUMERAL } (ap$$
$$\text{c\_2Earithmetic\_2EBIT2 } (ap \text{ c\_2Earithmetic\_2EBIT2 c\_2Earithmetic\_2EZERO})))) =$$
$$(ap \ c\_2Estring\_2ECHR \ (ap \text{ c\_2Earithmetic\_2ENUMERAL } (ap \text{ c\_2Earithmetic\_2EBIT2}$$
$$(ap \text{ c\_2Earithmetic\_2EBIT2 } (ap \text{ c\_2Earithmetic\_2EBIT2 } (ap \text{ c\_2Earithmetic\_2EBIT1}$$
$$(ap \text{ c\_2Earithmetic\_2EBIT2 c\_2Earithmetic\_2EZERO})))))))) \wedge ($$
$$((ap \text{ c\_2EASCIInumbers\_2EHEX } (ap \text{ c\_2Earithmetic\_2ENUMERAL } (ap$$
$$\text{c\_2Earithmetic\_2EBIT1 } (ap \text{ c\_2Earithmetic\_2EBIT1 } (ap \text{ c\_2Earithmetic\_2EBIT1}$$
$$\text{c\_2Earithmetic\_2EZERO})))) = (ap \ c\_2Estring\_2ECHR \ (ap \text{ c\_2Earithmetic\_2ENUMERAL}$$
$$(ap \text{ c\_2Earithmetic\_2EBIT1 } (ap \text{ c\_2Earithmetic\_2EBIT1 } (ap \text{ c\_2Earithmetic\_2EBIT1}$$
$$(ap \text{ c\_2Earithmetic\_2EBIT2 } (ap \text{ c\_2Earithmetic\_2EBIT2 c\_2Earithmetic\_2EZERO})))))))) \wedge$$
$$(((ap \text{ c\_2EASCIInumbers\_2EHEX } (ap \text{ c\_2Earithmetic\_2ENUMERAL } ($$
$$ap \text{ c\_2Earithmetic\_2EBIT2 } (ap \text{ c\_2Earithmetic\_2EBIT1 } (ap \text{ c\_2Earithmetic\_2EBIT1}$$
$$\text{c\_2Earithmetic\_2EZERO})))) = (ap \ c\_2Estring\_2ECHR \ (ap \text{ c\_2Earithmetic\_2ENUMERAL}$$
$$(ap \text{ c\_2Earithmetic\_2EBIT2 } (ap \text{ c\_2Earithmetic\_2EBIT1 } (ap \text{ c\_2Earithmetic\_2EBIT1}$$
$$(ap \text{ c\_2Earithmetic\_2EBIT2 } (ap \text{ c\_2Earithmetic\_2EBIT2 c\_2Earithmetic\_2EZERO})))))))) \wedge$$
$$(((ap \text{ c\_2EASCIInumbers\_2EHEX } (ap \text{ c\_2Earithmetic\_2ENUMERAL } ($$
$$ap \text{ c\_2Earithmetic\_2EBIT1 } (ap \text{ c\_2Earithmetic\_2EBIT2 } (ap \text{ c\_2Earithmetic\_2EBIT1}$$
$$\text{c\_2Earithmetic\_2EZERO})))) = (ap \ c\_2Estring\_2ECHR \ (ap \text{ c\_2Earithmetic\_2ENUMERAL}$$
$$(ap \text{ c\_2Earithmetic\_2EBIT1 } (ap \text{ c\_2Earithmetic\_2EBIT2 } (ap \text{ c\_2Earithmetic\_2EBIT1}$$
$$(ap \text{ c\_2Earithmetic\_2EBIT2 } (ap \text{ c\_2Earithmetic\_2EBIT2 c\_2Earithmetic\_2EZERO})))))))) \wedge$$
$$(((ap \text{ c\_2EASCIInumbers\_2EHEX } (ap \text{ c\_2Earithmetic\_2ENUMERAL } ($$
$$ap \text{ c\_2Earithmetic\_2EBIT2 } (ap \text{ c\_2Earithmetic\_2EBIT2 } (ap \text{ c\_2Earithmetic\_2EBIT1}$$
$$\text{c\_2Earithmetic\_2EZERO})))) = (ap \ c\_2Estring\_2ECHR \ (ap \text{ c\_2Earithmetic\_2ENUMERAL}$$
$$(ap \text{ c\_2Earithmetic\_2EBIT1 } (ap \text{ c\_2Earithmetic\_2EBIT2 } (ap \text{ c\_2Earithmetic\_2EBIT1}$$
$$(ap \text{ c\_2Earithmetic\_2EBIT1 } (ap \text{ c\_2Earithmetic\_2EBIT1 } (ap \text{ c\_2Earithmetic\_2EBIT1}$$
$$\text{c\_2Earithmetic\_2EZERO})))))))))) \wedge (((ap \text{ c\_2EASCIInumbers\_2EHEX}$$
$$(ap \text{ c\_2Earithmetic\_2ENUMERAL } (ap \text{ c\_2Earithmetic\_2EBIT1 } (ap \text{ c\_2Earithmetic\_2EBIT1}$$
$$(ap \text{ c\_2Earithmetic\_2EBIT2 c\_2Earithmetic\_2EZERO})))))) = (ap \ c\_2Estring\_2ECHR$$
$$(ap \text{ c\_2Earithmetic\_2ENUMERAL } (ap \text{ c\_2Earithmetic\_2EBIT2 } (ap \text{ c\_2Earithmetic\_2EBIT2}$$
$$(ap \text{ c\_2Earithmetic\_2EBIT1 } (ap \text{ c\_2Earithmetic\_2EBIT1 } (ap \text{ c\_2Earithmetic\_2EBIT1}$$
$$(ap \text{ c\_2Earithmetic\_2EBIT1 c\_2Earithmetic\_2EZERO}))))))))) \wedge$$
$$(((ap \text{ c\_2EASCIInumbers\_2EHEX } (ap \text{ c\_2Earithmetic\_2ENUMERAL } ($$

Assume the following.

$(((ap$ c_2EASCIInumbers_2EUNHEX $(ap$ $c\_2Estring\_2ECHR$ $(ap$ c_2Earithmetic_2ENUMERAL
$(ap$ c_2Earithmetic_2EBIT2 $(ap$ c_2Earithmetic_2EBIT1 $(ap$ c_2Earithmetic_2EBIT1
$(ap$ c_2Earithmetic_2EBIT1 $(ap$ c_2Earithmetic_2EBIT2 c_2Earithmetic_2EZERO$)))))))) =$
c_2Enum_2E0$)\wedge(((ap$ c_2EASCIInumbers_2EUNHEX $(ap$ $c\_2Estring\_2ECHR$
$(ap$ c_2Earithmetic_2ENUMERAL $(ap$ c_2Earithmetic_2EBIT1 $(ap$ c_2Earithmetic_2EBIT2
$(ap$ c_2Earithmetic_2EBIT1 $(ap$ c_2Earithmetic_2EBIT1 $(ap$ c_2Earithmetic_2EBIT2
c_2Earithmetic_2EZERO$)))))))) = (ap$ c_2Earithmetic_2ENUMERAL
$(ap$ c_2Earithmetic_2EBIT1 c_2Earithmetic_2EZERO$)))\wedge(((ap$ c_2EASCIInumbers_2EUNHEX
$(ap$ $c\_2Estring\_2ECHR$ $(ap$ c_2Earithmetic_2ENUMERAL $(ap$ c_2Earithmetic_2EBIT2
$(ap$ c_2Earithmetic_2EBIT2 $(ap$ c_2Earithmetic_2EBIT1 $(ap$ c_2Earithmetic_2EBIT1
$(ap$ c_2Earithmetic_2EBIT2 c_2Earithmetic_2EZERO$)))))))) = ($
ap c_2Earithmetic_2ENUMERAL $(ap$ c_2Earithmetic_2EBIT2 c_2Earithmetic_2EZERO$)))\wedge$
$(((ap$ c_2EASCIInumbers_2EUNHEX $(ap$ $c\_2Estring\_2ECHR$ $(ap$ c_2Earithmetic_2ENUMERAL
$(ap$ c_2Earithmetic_2EBIT1 $(ap$ c_2Earithmetic_2EBIT1 $(ap$ c_2Earithmetic_2EBIT2
$(ap$ c_2Earithmetic_2EBIT1 $(ap$ c_2Earithmetic_2EBIT2 c_2Earithmetic_2EZERO$)))))))) =$
$(ap$ c_2Earithmetic_2ENUMERAL $(ap$ c_2Earithmetic_2EBIT1 $(ap$ c_2Earithmetic_2EBIT1
c_2Earithmetic_2EZERO$))))\wedge(((ap$ c_2EASCIInumbers_2EUNHEX
$(ap$ $c\_2Estring\_2ECHR$ $(ap$ c_2Earithmetic_2ENUMERAL $(ap$ c_2Earithmetic_2EBIT2
$(ap$ c_2Earithmetic_2EBIT1 $(ap$ c_2Earithmetic_2EBIT2 $(ap$ c_2Earithmetic_2EBIT1
$(ap$ c_2Earithmetic_2EBIT2 c_2Earithmetic_2EZERO$)))))))) = ($
ap c_2Earithmetic_2ENUMERAL $(ap$ c_2Earithmetic_2EBIT2 $(ap$ c_2Earithmetic_2EBIT1
c_2Earithmetic_2EZERO$))))\wedge(((ap$ c_2EASCIInumbers_2EUNHEX
$(ap$ $c\_2Estring\_2ECHR$ $(ap$ c_2Earithmetic_2ENUMERAL $(ap$ c_2Earithmetic_2EBIT1
$(ap$ c_2Earithmetic_2EBIT2 $(ap$ c_2Earithmetic_2EBIT1 $(ap$ c_2Earithmetic_2EBIT1
$(ap$ c_2Earithmetic_2EBIT2 c_2Earithmetic_2EZERO$)))))))) = ($
ap c_2Earithmetic_2ENUMERAL $(ap$ c_2Earithmetic_2EBIT1 $(ap$ c_2Earithmetic_2EBIT2
c_2Earithmetic_2EZERO$))))\wedge(((ap$ c_2EASCIInumbers_2EUNHEX
$(ap$ $c\_2Estring\_2ECHR$ $(ap$ c_2Earithmetic_2ENUMERAL $(ap$ c_2Earithmetic_2EBIT2
$(ap$ c_2Earithmetic_2EBIT2 $(ap$ c_2Earithmetic_2EBIT2 $(ap$ c_2Earithmetic_2EBIT1
$(ap$ c_2Earithmetic_2EBIT2 c_2Earithmetic_2EZERO$)))))))) = ($
ap c_2Earithmetic_2ENUMERAL $(ap$ c_2Earithmetic_2EBIT2 $(ap$ c_2Earithmetic_2EBIT2
c_2Earithmetic_2EZERO$))))\wedge(((ap$ c_2EASCIInumbers_2EUNHEX
$(ap$ $c\_2Estring\_2ECHR$ $(ap$ c_2Earithmetic_2ENUMERAL $(ap$ c_2Earithmetic_2EBIT1
$(ap$ c_2Earithmetic_2EBIT1 $(ap$ c_2Earithmetic_2EBIT1 $(ap$ c_2Earithmetic_2EBIT2
$(ap$ c_2Earithmetic_2EBIT2 c_2Earithmetic_2EZERO$)))))))) = ($
ap c_2Earithmetic_2ENUMERAL $(ap$ c_2Earithmetic_2EBIT1 $(ap$ c_2Earithmetic_2EBIT1
$(ap$ c_2Earithmetic_2EBIT1 c_2Earithmetic_2EZERO$)))))\wedge(((ap$
c_2EASCIInumbers_2EUNHEX $(ap$ $c\_2Estring\_2ECHR$ $(ap$ c_2Earithmetic_2ENUMERAL
$(ap$ c_2Earithmetic_2EBIT2 $(ap$ c_2Earithmetic_2EBIT1 $(ap$ c_2Earithmetic_2EBIT1
$(ap$ c_2Earithmetic_2EBIT2 $(ap$ c_2Earithmetic_2EBIT2 c_2Earithmetic_2EZERO$)))))))) =$
$(ap$ c_2Earithmetic_2ENUMERAL $(ap$ c_2Earithmetic_2EBIT2 $(ap$ c_2Earithmetic_2EBIT1
$(ap$ c_2Earithmetic_2EBIT1 c_2Earithmetic_2EZERO$)))))\wedge(((ap$
c_2EASCIInumbers_2EUNHEX $(ap$ $c\_2Estring\_2ECHR$ $(ap$ c_2Earithmetic_2ENUMERAL
$(ap$ c_2Earithmetic_2EBIT1 $(ap$ c_2Earithmetic_2EBIT2 $(ap$ c_2Earithmetic_2EBIT1
$(ap$ c_2Earithmetic_2EBIT2 $(ap$ c_2Earithmetic_2EBIT2 c_2Earithmetic_2EZERO$)))))))) =$
$(ap$ c_2Earithmetic_2ENUMERAL $(ap$ c_2Earithmetic_2EBIT1 $(ap$ c_2Earithmetic_2EBIT2
$(ap$ c_2Earithmetic_2EBIT1 c_2Earithmetic_2EZERO$)))))\wedge(((ap$
c_2EASCIInumbers_2EUNHEX $(ap$ $c\_2Estring\_2ECHR$ $(ap$ c_2Earithmetic_2ENUMERAL
$(ap$ c_2Earithmetic_2EBIT1 $(ap$ c_2Earithmetic_2EBIT2 $(ap$ c_2Earithmetic_2EBIT1
$(ap$ c_2Earithmetic_2EBIT1 $(ap$ c_2Earithmetic_2EBIT1 $(ap$ c_2Earithmetic_2EBIT2
c_2Earithmetic_2EZERO$))))))))) = (ap$ c_2Earithmetic_2ENUMERAL
$(ap$ c_2Earithmetic_2EBIT2 $(ap$ c_2Earithmetic_2EBIT2 $(ap$ c_2Earithmetic_2EBIT1
c_2Earithmetic_2EZERO$)))))\wedge(((ap$ c_2EASCIInumbers_2EUNHEX
$(ap$ $c\_2Estring\_2ECHR$ $(ap$ c_2Earithmetic_2ENUMERAL $(ap$ c_2Earithmetic_2EBIT2
$(ap$ c_2Earithmetic_2EBIT2 $(ap$ c_2Earithmetic_2EBIT1 $(ap$ c_2Earithmetic_2EBIT1
$(ap$ c_2Earithmetic_2EBIT1 $(ap$ c_2Earithmetic_2EBIT2 c_2Earithmetic_2EZERO$))))))))) =$
$(ap$ c_2Earithmetic_2ENUMERAL $(ap$ c_2Earithmetic_2EBIT1 $(ap$ c_2Earithmetic_2EBIT1
$(ap$ c_2Earithmetic_2EBIT2 c_2Earithmetic_2EZERO$)))))\wedge(((ap$

Assume the following.

$$(\forall V0c \in ty\_2Enum\_2Enum.((ap\ (ap\ c\_2Earithmetic\_2E\_2D\ V0c)$$
$$V0c) = \mathsf{c\_2Enum\_2E0})) \tag{18}$$

Assume the following.

$$\forall A\_27a.nonempty\ A\_27a \Rightarrow (\forall V0f \in ((A\_27a^{ty\_2Enum\_2Enum})^{ty\_2Enum\_2Enum}).$$
$$(\forall V1g \in (A\_27a^{ty\_2Enum\_2Enum}).((\forall V2n \in ty\_2Enum\_2Enum.$$
$$((ap\ V1g\ (ap\ \mathsf{c\_2Enum\_2ESUC}\ V2n)) = (ap\ (ap\ V0f\ V2n)\ (ap\ \mathsf{c\_2Enum\_2ESUC}$$
$$V2n)))) \Leftrightarrow ((\forall V3n \in ty\_2Enum\_2Enum.((ap\ V1g\ (ap\ \mathsf{c\_2Earithmetic\_2ENUMERAL}$$
$$(ap\ \mathsf{c\_2Earithmetic\_2EBIT1}\ V3n))) = (ap\ (ap\ V0f\ (ap\ (ap\ \mathsf{c\_2Earithmetic\_2E\_2D}$$
$$(ap\ \mathsf{c\_2Earithmetic\_2ENUMERAL}\ (ap\ \mathsf{c\_2Earithmetic\_2EBIT1}\ V3n)))$$
$$(ap\ \mathsf{c\_2Earithmetic\_2ENUMERAL}\ (ap\ \mathsf{c\_2Earithmetic\_2EBIT1}\ \mathsf{c\_2Earithmetic\_2EZERO}))))$$
$$(ap\ \mathsf{c\_2Earithmetic\_2ENUMERAL}\ (ap\ \mathsf{c\_2Earithmetic\_2EBIT1}\ V3n))))))) \wedge$$
$$(\forall V4n \in ty\_2Enum\_2Enum.((ap\ V1g\ (ap\ \mathsf{c\_2Earithmetic\_2ENUMERAL}$$
$$(ap\ \mathsf{c\_2Earithmetic\_2EBIT2}\ V4n))) = (ap\ (ap\ V0f\ (ap\ \mathsf{c\_2Earithmetic\_2ENUMERAL}$$
$$(ap\ \mathsf{c\_2Earithmetic\_2EBIT1}\ V4n)))\ (ap\ \mathsf{c\_2Earithmetic\_2ENUMERAL}$$
$$(ap\ \mathsf{c\_2Earithmetic\_2EBIT2}\ V4n))))))))))) \tag{19}$$

Assume the following.
$$True \tag{20}$$

Assume the following.

$$(\forall V0t1 \in 2.(\forall V1t2 \in 2.(((p\ V0t1) \Rightarrow (p\ V1t2)) \Rightarrow (((p\ V1t2) \Rightarrow (p\ V0t1)) \Rightarrow ((p\ V0t1) \Leftrightarrow (p\ V1t2))))))) \tag{21}$$

Assume the following.

$$(\forall V0t \in 2.(False \Rightarrow (p\ V0t))) \tag{22}$$

Assume the following.

$$(\forall V0t \in 2.(((True \vee (p\ V0t)) \Leftrightarrow True) \wedge ((((p\ V0t) \vee True) \Leftrightarrow True) \wedge$$
$$(((False \vee (p\ V0t)) \Leftrightarrow (p\ V0t)) \wedge ((((p\ V0t) \vee False) \Leftrightarrow (p\ V0t)) \wedge (((p\ V0t) \vee$$
$$(p\ V0t)) \Leftrightarrow (p\ V0t)))))))) \tag{23}$$

Assume the following.

$$\forall A\_27a.nonempty\ A\_27a \Rightarrow (\forall V0x \in A\_27a.((V0x = V0x) \Leftrightarrow True)) \tag{24}$$

Assume the following.

$$\forall A\_27a.nonempty\ A\_27a \Rightarrow (\forall V0x \in A\_27a.(\forall V1y \in A\_27a.((V0x = V1y) \Leftrightarrow (V1y = V0x)))) \tag{25}$$

Assume the following.

$$\forall A\_27a.nonempty\ A\_27a \Rightarrow (\forall V0t1 \in A\_27a.(\forall V1t2 \in \\ A\_27a.(((ap\ (ap\ (ap\ \mathsf{c\_2Ebool\_2ECOND}\ A\_27a)\ \mathsf{c\_2Ebool\_2ET})\ V0t1) \\ V1t2) = V0t1) \wedge ((ap\ (ap\ (ap\ \mathsf{c\_2Ebool\_2ECOND}\ A\_27a)\ \mathsf{c\_2Ebool\_2EF}) \\ V0t1)\ V1t2) = V1t2))))$$

(26)

Assume the following.

$$(\forall V0t1 \in 2.(\forall V1t2 \in 2.(\forall V2t3 \in 2.(((p\ V0t1) \Rightarrow \\ ((p\ V1t2) \Rightarrow (p\ V2t3))) \Leftrightarrow (((p\ V0t1) \wedge (p\ V1t2)) \Rightarrow (p\ V2t3))))))$$

(27)

Assume the following.

$$(\forall V0x \in 2.(\forall V1x\_27 \in 2.(\forall V2y \in 2.(\forall V3y\_27 \in \\ 2.((((p\ V0x) \Leftrightarrow (p\ V1x\_27)) \wedge ((p\ V1x\_27) \Rightarrow ((p\ V2y) \Leftrightarrow (p\ V3y\_27)))) \Rightarrow \\ (((p\ V0x) \Rightarrow (p\ V2y)) \Leftrightarrow ((p\ V1x\_27) \Rightarrow (p\ V3y\_27))))))))$$

(28)

7

Assume the following.

$((\forall V0n \in ty\_2Enum\_2Enum.((ap\ (ap\ c\_2Earithmetic\_2E\_2B$
c_2Enum_2E0) $V0n) = V0n))\wedge((\forall V1n \in ty\_2Enum\_2Enum.((ap$
$(ap\ c\_2Earithmetic\_2E\_2B\ V1n)$ c_2Enum_2E0) $= V1n))\wedge((\forall V2n \in$
$ty\_2Enum\_2Enum.(\forall V3m \in ty\_2Enum\_2Enum.((ap\ (ap\ c\_2Earithmetic\_2E\_2B$
$(ap$ c_2Earithmetic_2ENUMERAL $V2n))\ (ap$ c_2Earithmetic_2ENUMERAL
$V3m)) = (ap$ c_2Earithmetic_2ENUMERAL $(ap$ c_2Enumeral_2EiZ $(ap$
$(ap\ c\_2Earithmetic\_2E\_2B\ V2n)\ V3m))))))\wedge((\forall V4n \in ty\_2Enum\_2Enum.$
$((ap\ (ap\ c\_2Earithmetic\_2E\_2A$ c_2Enum_2E0) $V4n) =$ c_2Enum_2E0$))\wedge$
$((\forall V5n \in ty\_2Enum\_2Enum.((ap\ (ap\ c\_2Earithmetic\_2E\_2A$
$V5n)$ c_2Enum_2E0$) =$ c_2Enum_2E0$))\wedge((\forall V6n \in ty\_2Enum\_2Enum.$
$(\forall V7m \in ty\_2Enum\_2Enum.((ap\ (ap\ c\_2Earithmetic\_2E\_2A\ ($
ap c_2Earithmetic_2ENUMERAL $V6n))\ (ap$ c_2Earithmetic_2ENUMERAL
$V7m)) = (ap$ c_2Earithmetic_2ENUMERAL $(ap\ (ap\ c\_2Earithmetic\_2E\_2A$
$V6n)\ V7m)))))\wedge((\forall V8n \in ty\_2Enum\_2Enum.((ap\ (ap\ c\_2Earithmetic\_2E\_2D$
c_2Enum_2E0) $V8n) =$ c_2Enum_2E0$))\wedge((\forall V9n \in ty\_2Enum\_2Enum.$
$((ap\ (ap\ c\_2Earithmetic\_2E\_2D\ V9n)$ c_2Enum_2E0$) = V9n))\wedge((\forall V10n \in$
$ty\_2Enum\_2Enum.(\forall V11m \in ty\_2Enum\_2Enum.((ap\ (ap\ c\_2Earithmetic\_2E\_2D$
$(ap$ c_2Earithmetic_2ENUMERAL $V10n))\ (ap$ c_2Earithmetic_2ENUMERAL
$V11m)) = (ap$ c_2Earithmetic_2ENUMERAL $(ap\ (ap\ c\_2Earithmetic\_2E\_2D$
$V10n)\ V11m)))))\wedge((\forall V12n \in ty\_2Enum\_2Enum.((ap\ (ap\ c\_2Earithmetic\_2EEXP$
c_2Enum_2E0) $(ap$ c_2Earithmetic_2ENUMERAL $(ap$ c_2Earithmetic_2EBIT1
$V12n))) =$ c_2Enum_2E0$))\wedge((\forall V13n \in ty\_2Enum\_2Enum.((ap$
$(ap\ c\_2Earithmetic\_2EEXP$ c_2Enum_2E0) $(ap$ c_2Earithmetic_2ENUMERAL
$(ap$ c_2Earithmetic_2EBIT2 $V13n))) =$ c_2Enum_2E0$))\wedge((\forall V14n \in$
$ty\_2Enum\_2Enum.((ap\ (ap\ c\_2Earithmetic\_2EEXP\ V14n)$ c_2Enum_2E0$) =$
$(ap$ c_2Earithmetic_2ENUMERAL $(ap$ c_2Earithmetic_2EBIT1 c_2Earithmetic_2EZERO$))))\wedge$
$((\forall V15n \in ty\_2Enum\_2Enum.(\forall V16m \in ty\_2Enum\_2Enum.$
$((ap\ (ap\ c\_2Earithmetic\_2EEXP\ (ap$ c_2Earithmetic_2ENUMERAL $V15n))$
$(ap$ c_2Earithmetic_2ENUMERAL $V16m)) = (ap$ c_2Earithmetic_2ENUMERAL
$(ap\ (ap\ c\_2Earithmetic\_2EEXP\ V15n)\ V16m)))))\wedge(((ap$ c_2Enum_2ESUC
c_2Enum_2E0) $= (ap$ c_2Earithmetic_2ENUMERAL $(ap$ c_2Earithmetic_2EBIT1
c_2Earithmetic_2EZERO$)))\wedge((\forall V17n \in ty\_2Enum\_2Enum.($
$(ap$ c_2Enum_2ESUC $(ap$ c_2Earithmetic_2ENUMERAL $V17n)) = (ap$ c_2Earithmetic_2ENUMERAL
$(ap$ c_2Enum_2ESUC $V17n))))\wedge(((ap$ c_2Eprim__rec_2EPRE c_2Enum_2E0$) =$
c_2Enum_2E0$)\wedge((\forall V18n \in ty\_2Enum\_2Enum.((ap$ c_2Eprim__rec_2EPRE
$(ap$ c_2Earithmetic_2ENUMERAL $V18n)) = (ap$ c_2Earithmetic_2ENUMERAL
$(ap$ c_2Eprim__rec_2EPRE $V18n))))\wedge((\forall V19n \in ty\_2Enum\_2Enum.$
$(((ap$ c_2Earithmetic_2ENUMERAL $V19n) =$ c_2Enum_2E0$)\Leftrightarrow(V19n =$ c_2Earithmetic_2EZERO$)))\wedge$
$((\forall V20n \in ty\_2Enum\_2Enum.(($c_2Enum_2E0 $= (ap$ c_2Earithmetic_2ENUMERAL
$V20n))\Leftrightarrow(V20n =$ c_2Earithmetic_2EZERO$)))\wedge((\forall V21n \in ty\_2Enum\_2Enum.$
$(\forall V22m \in ty\_2Enum\_2Enum.(((ap$ c_2Earithmetic_2ENUMERAL
$V21n) = (ap$ c_2Earithmetic_2ENUMERAL $V22m))\Leftrightarrow(V21n = V22m))))\wedge$
$((\forall V23n \in ty\_2Enum\_2Enum.((p\ (ap\ (ap$ c_2Eprim__rec_2E_3C
$V23n)$ c_2Enum_2E0$))\Leftrightarrow False))\wedge((\forall V24n \in ty\_2Enum\_2Enum.$
$((p\ (ap\ (ap$ c_2Eprim__rec_2E_3C c_2Enum_2E0) $(ap$ c_2Earithmetic_2ENUMERAL
$V24n)))\Leftrightarrow(p\ (ap\ (ap$ c_2Eprim__rec_2E_3C c_2Earithmetic_2EZERO$)$
$V24n))))\wedge((\forall V25n \in ty\_2Enum\_2Enum.(\forall V26m \in ty\_2Enum\_2Enum.$
$((p\ (ap\ (ap$ c_2Eprim__rec_2E_3C $(ap$ c_2Earithmetic_2ENUMERAL
$V25n))\ (ap$ c_2Earithmetic_2ENUMERAL $V26m)))\Leftrightarrow(p\ (ap\ (ap$ c_2Eprim__rec_2E_3C
$V25n)\ V26m)))))\wedge((\forall V27n \in ty\_2Enum\_2Enum.((p\ (ap\ (ap$ c_2Earithmetic_2E_3E
c_2Enum_2E0) $V27n))\Leftrightarrow False))\wedge((\forall V28n \in ty\_2Enum\_2Enum.$
$((p\ (ap\ (ap$ c_2Earithmetic_2E_3E $(ap$ c_2Earithmetic_2ENUMERAL
$V28n))$ c_2Enum_2E0$))\Leftrightarrow(p\ (ap\ (ap$ c_2Eprim__rec_2E_3C c_2Earithmetic_2EZERO$)$
$V28n))))\wedge((\forall V29n \in ty\_2Enum\_2Enum.(\forall V30m \in ty\_2Enum\_2Enum.$
$((p\ (ap\ (ap$ c_2Earithmetic_2E_3E $(ap$ c_2Earithmetic_2ENUMERAL
$V29n))\ (ap$ c_2Earithmetic_2ENUMERAL $V30m)))\Leftrightarrow(p\ (ap\ (ap$ c_2Eprim__rec_2E_3C
$V30m)\ V29n)))))\wedge((\forall V31n \in ty\_2Enum\_2Enum.((p\ (ap\ (ap$ c_2Earithmetic_2E_3C_3D
c_2Enum_2E0) $V31n))\Leftrightarrow True))\wedge((\forall V32n \in ty\_2Enum\_2Enum.$

Assume the following.

$$(\forall V0n \in ty\_2Enum\_2Enum.(\forall V1m \in ty\_2Enum\_2Enum.($$
$$((p\ (ap\ (ap\ \mathsf{c\_2Eprim\_\_rec\_2E\_3C}\ \mathsf{c\_2Earithmetic\_2EZERO})\ (ap\ \mathsf{c\_2Earithmetic\_2EBIT1}$$
$$V0n)))\Leftrightarrow True)\wedge(((p\ (ap\ (ap\ \mathsf{c\_2Eprim\_\_rec\_2E\_3C}\ \mathsf{c\_2Earithmetic\_2EZERO})$$
$$(ap\ \mathsf{c\_2Earithmetic\_2EBIT2}\ V0n)))\Leftrightarrow True)\wedge(((p\ (ap\ (ap\ \mathsf{c\_2Eprim\_\_rec\_2E\_3C}$$
$$V0n)\ \mathsf{c\_2Earithmetic\_2EZERO}))\Leftrightarrow False)\wedge(((p\ (ap\ (ap\ \mathsf{c\_2Eprim\_\_rec\_2E\_3C}$$
$$(ap\ \mathsf{c\_2Earithmetic\_2EBIT1}\ V0n))\ (ap\ \mathsf{c\_2Earithmetic\_2EBIT1}\ V1m)))\Leftrightarrow$$
$$(p\ (ap\ (ap\ \mathsf{c\_2Eprim\_\_rec\_2E\_3C}\ V0n)\ V1m)))\wedge(((p\ (ap\ (ap\ \mathsf{c\_2Eprim\_\_rec\_2E\_3C}$$
$$(ap\ \mathsf{c\_2Earithmetic\_2EBIT2}\ V0n))\ (ap\ \mathsf{c\_2Earithmetic\_2EBIT2}\ V1m)))\Leftrightarrow$$
$$(p\ (ap\ (ap\ \mathsf{c\_2Eprim\_\_rec\_2E\_3C}\ V0n)\ V1m)))\wedge(((p\ (ap\ (ap\ \mathsf{c\_2Eprim\_\_rec\_2E\_3C}$$
$$(ap\ \mathsf{c\_2Earithmetic\_2EBIT1}\ V0n))\ (ap\ \mathsf{c\_2Earithmetic\_2EBIT2}\ V1m)))\Leftrightarrow$$
$$(\neg(p\ (ap\ (ap\ \mathsf{c\_2Eprim\_\_rec\_2E\_3C}\ V1m)\ V0n))))\wedge((p\ (ap\ (ap\ \mathsf{c\_2Eprim\_\_rec\_2E\_3C}$$
$$(ap\ \mathsf{c\_2Earithmetic\_2EBIT2}\ V0n))\ (ap\ \mathsf{c\_2Earithmetic\_2EBIT1}\ V1m)))\Leftrightarrow$$
$$(p\ (ap\ (ap\ \mathsf{c\_2Eprim\_\_rec\_2E\_3C}\ V0n)\ V1m)))))))))))$$
$$\tag{30}$$

Assume the following.

$$(\forall V0x \in ty\_2Enum\_2Enum.(\forall V1b \in 2.(\forall V2n \in ty\_2Enum\_2Enum.$$
$$(\forall V3m \in ty\_2Enum\_2Enum.(((ap\ (ap\ (ap\ c\_2Enumeral\_2EiSUB$$
$$V1b)\ \textsf{c\_2Earithmetic\_2EZERO})\ V0x) = \textsf{c\_2Earithmetic\_2EZERO}) \wedge ($$
$$((ap\ (ap\ (ap\ c\_2Enumeral\_2EiSUB\ \textsf{c\_2Ebool\_2ET})\ V2n)\ \textsf{c\_2Earithmetic\_2EZERO}) =$$
$$V2n) \wedge (((ap\ (ap\ (ap\ c\_2Enumeral\_2EiSUB\ \textsf{c\_2Ebool\_2EF})\ (ap\ \textsf{c\_2Earithmetic\_2EBIT1}$$
$$V2n))\ \textsf{c\_2Earithmetic\_2EZERO}) = (ap\ \textsf{c\_2Enumeral\_2EiDUB}\ V2n)) \wedge$$
$$(((ap\ (ap\ (ap\ c\_2Enumeral\_2EiSUB\ \textsf{c\_2Ebool\_2ET})\ (ap\ \textsf{c\_2Earithmetic\_2EBIT1}$$
$$V2n))\ (ap\ \textsf{c\_2Earithmetic\_2EBIT1}\ V3m)) = (ap\ \textsf{c\_2Enumeral\_2EiDUB}$$
$$(ap\ (ap\ (ap\ c\_2Enumeral\_2EiSUB\ \textsf{c\_2Ebool\_2ET})\ V2n)\ V3m))) \wedge (((ap$$
$$(ap\ (ap\ c\_2Enumeral\_2EiSUB\ \textsf{c\_2Ebool\_2EF})\ (ap\ \textsf{c\_2Earithmetic\_2EBIT1}$$
$$V2n))\ (ap\ \textsf{c\_2Earithmetic\_2EBIT1}\ V3m)) = (ap\ \textsf{c\_2Earithmetic\_2EBIT1}$$
$$(ap\ (ap\ (ap\ c\_2Enumeral\_2EiSUB\ \textsf{c\_2Ebool\_2EF})\ V2n)\ V3m))) \wedge (((ap$$
$$(ap\ (ap\ c\_2Enumeral\_2EiSUB\ \textsf{c\_2Ebool\_2ET})\ (ap\ \textsf{c\_2Earithmetic\_2EBIT1}$$
$$V2n))\ (ap\ \textsf{c\_2Earithmetic\_2EBIT2}\ V3m)) = (ap\ \textsf{c\_2Earithmetic\_2EBIT1}$$
$$(ap\ (ap\ (ap\ c\_2Enumeral\_2EiSUB\ \textsf{c\_2Ebool\_2EF})\ V2n)\ V3m))) \wedge (((ap$$
$$(ap\ (ap\ c\_2Enumeral\_2EiSUB\ \textsf{c\_2Ebool\_2EF})\ (ap\ \textsf{c\_2Earithmetic\_2EBIT1}$$
$$V2n))\ (ap\ \textsf{c\_2Earithmetic\_2EBIT2}\ V3m)) = (ap\ \textsf{c\_2Enumeral\_2EiDUB}$$
$$(ap\ (ap\ (ap\ c\_2Enumeral\_2EiSUB\ \textsf{c\_2Ebool\_2EF})\ V2n)\ V3m))) \wedge (((ap$$
$$(ap\ (ap\ c\_2Enumeral\_2EiSUB\ \textsf{c\_2Ebool\_2EF})\ (ap\ \textsf{c\_2Earithmetic\_2EBIT2}$$
$$V2n))\ \textsf{c\_2Earithmetic\_2EZERO}) = (ap\ \textsf{c\_2Earithmetic\_2EBIT1}\ V2n)) \wedge$$
$$(((ap\ (ap\ (ap\ c\_2Enumeral\_2EiSUB\ \textsf{c\_2Ebool\_2ET})\ (ap\ \textsf{c\_2Earithmetic\_2EBIT2}$$
$$V2n))\ (ap\ \textsf{c\_2Earithmetic\_2EBIT1}\ V3m)) = (ap\ \textsf{c\_2Earithmetic\_2EBIT1}$$
$$(ap\ (ap\ (ap\ c\_2Enumeral\_2EiSUB\ \textsf{c\_2Ebool\_2ET})\ V2n)\ V3m))) \wedge (((ap$$
$$(ap\ (ap\ c\_2Enumeral\_2EiSUB\ \textsf{c\_2Ebool\_2EF})\ (ap\ \textsf{c\_2Earithmetic\_2EBIT2}$$
$$V2n))\ (ap\ \textsf{c\_2Earithmetic\_2EBIT1}\ V3m)) = (ap\ \textsf{c\_2Enumeral\_2EiDUB}$$
$$(ap\ (ap\ (ap\ c\_2Enumeral\_2EiSUB\ \textsf{c\_2Ebool\_2ET})\ V2n)\ V3m))) \wedge (((ap$$
$$(ap\ (ap\ c\_2Enumeral\_2EiSUB\ \textsf{c\_2Ebool\_2ET})\ (ap\ \textsf{c\_2Earithmetic\_2EBIT2}$$
$$V2n))\ (ap\ \textsf{c\_2Earithmetic\_2EBIT2}\ V3m)) = (ap\ \textsf{c\_2Enumeral\_2EiDUB}$$
$$(ap\ (ap\ (ap\ c\_2Enumeral\_2EiSUB\ \textsf{c\_2Ebool\_2ET})\ V2n)\ V3m))) \wedge ((ap$$
$$(ap\ (ap\ c\_2Enumeral\_2EiSUB\ \textsf{c\_2Ebool\_2EF})\ (ap\ \textsf{c\_2Earithmetic\_2EBIT2}$$
$$V2n))\ (ap\ \textsf{c\_2Earithmetic\_2EBIT2}\ V3m)) = (ap\ \textsf{c\_2Earithmetic\_2EBIT1}$$
$$(ap\ (ap\ (ap\ c\_2Enumeral\_2EiSUB\ \textsf{c\_2Ebool\_2EF})\ V2n)\ V3m)))))))))))))))))))$$

$$(31)$$

Assume the following.

$$(\forall V0n \in ty\_2Enum\_2Enum.(\forall V1m \in ty\_2Enum\_2Enum.($$
$$(ap\ \textsf{c\_2Earithmetic\_2ENUMERAL}\ (ap\ (ap\ c\_2Earithmetic\_2E\_2D\ V0n)$$
$$V1m)) = (ap\ (ap\ (ap\ (\textsf{c\_2Ebool\_2ECOND}\ ty\_2Enum\_2Enum)\ (ap\ (ap\ \textsf{c\_2Eprim\_\_rec\_2E\_3C}$$
$$V1m)\ V0n))\ (ap\ \textsf{c\_2Earithmetic\_2ENUMERAL}\ (ap\ (ap\ (ap\ c\_2Enumeral\_2EiSUB$$
$$\textsf{c\_2Ebool\_2ET})\ V0n)\ V1m)))\ \textsf{c\_2Enum\_2E0})))$$

$$(32)$$

Assume the following.

$$(\forall V0n \in ty\_2Enum\_2Enum.(((ap\ \mathsf{c\_2Enumeral\_2EiDUB}\ (ap\ \mathsf{c\_2Earithmetic\_2EBIT1}$$
$$V0n)) = (ap\ \mathsf{c\_2Earithmetic\_2EBIT2}\ (ap\ \mathsf{c\_2Enumeral\_2EiDUB}\ V0n)))\wedge$$
$$(((ap\ \mathsf{c\_2Enumeral\_2EiDUB}\ (ap\ \mathsf{c\_2Earithmetic\_2EBIT2}\ V0n)) = (ap$$
$$\mathsf{c\_2Earithmetic\_2EBIT2}\ (ap\ \mathsf{c\_2Earithmetic\_2EBIT1}\ V0n)))\wedge((ap$$
$$\mathsf{c\_2Enumeral\_2EiDUB}\ \mathsf{c\_2Earithmetic\_2EZERO}) = \mathsf{c\_2Earithmetic\_2EZERO}))))$$

(33)

Assume the following.

$$(\forall V0n \in ty\_2Enum\_2Enum.(\neg(p\ (ap\ (ap\ \mathsf{c\_2Eprim\_\_rec\_2E\_3C}$$
$$V0n)\ \mathsf{c\_2Enum\_2E0}))))$$

(34)

Assume the following.

$$(\forall V0m \in ty\_2Enum\_2Enum.(\forall V1n \in ty\_2Enum\_2Enum.($$
$$(p\ (ap\ (ap\ \mathsf{c\_2Eprim\_\_rec\_2E\_3C}\ V0m)\ (ap\ \mathsf{c\_2Enum\_2ESUC}\ V1n)))\Leftrightarrow($$
$$(V0m = V1n)\vee(p\ (ap\ (ap\ \mathsf{c\_2Eprim\_\_rec\_2E\_3C}\ V0m)\ V1n))))))$$

(35)

Theorem 1

$$(\forall V0n \in ty\_2Enum\_2Enum.((p\ (ap\ (ap\ \mathsf{c\_2Eprim\_\_rec\_2E\_3C}$$
$$V0n)\ (ap\ \mathsf{c\_2Earithmetic\_2ENUMERAL}\ (ap\ \mathsf{c\_2Earithmetic\_2EBIT2}$$
$$(ap\ \mathsf{c\_2Earithmetic\_2EBIT1}\ (ap\ \mathsf{c\_2Earithmetic\_2EBIT1}\ (ap\ \mathsf{c\_2Earithmetic\_2EBIT1}$$
$$\mathsf{c\_2Earithmetic\_2EZERO}))))))))\Rightarrow((ap\ \mathsf{c\_2EASCIInumbers\_2EUNHEX}$$
$$(ap\ \mathsf{c\_2EASCIInumbers\_2EHEX}\ V0n)) = V0n)))$$