thm_2Ebitstring_2Eword_ror__v2w (TMV2K4tHmc4rPerngEgsjdmgPHRAWhBA3hK)

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

$$nonempty\ ty\_2Enum\_2Enum \tag{1}$$

Let $ty\_2Elist\_2Elist : \iota{\Rightarrow}\iota$ be given. Assume the following.

$$\forall A0.nonempty\ A0{\Rightarrow}nonempty\ (ty\_2Elist\_2Elist\ A0) \tag{2}$$

Let $c\_2Elist\_2ELENGTH : \iota{\Rightarrow}\iota$ be given. Assume the following.

$$\forall A\_27a.nonempty\ A\_27a{\Rightarrow}c\_2Elist\_2ELENGTH\ A\_27a \in (ty\_2Enum\_2Enum^{(ty\_2Elist\_2Elist\ A\_27a)}) \tag{3}$$

Let $c\_2Earithmetic\_2EMOD : \iota$ be given. Assume the following.

$$c\_2Earithmetic\_2EMOD \in ((ty\_2Enum\_2Enum^{ty\_2Enum\_2Enum})^{ty\_2Enum\_2Enum}) \tag{4}$$

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

$$c\_2Enum\_2EZERO\_\_REP \in omega \tag{5}$$

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

$$c\_2Enum\_2EABS\_\_num \in (ty\_2Enum\_2Enum^{omega}) \tag{6}$$

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.

$$c\_2Enum\_2EREP\_\_num \in (omega^{ty\_2Enum\_2Enum}) \tag{7}$$

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

$$c\_2Enum\_2ESUC\_\_REP \in (omega^{omega}) \tag{8}$$

Definition 4 *We define* c_2Ebool_2ET *to be* $(ap\ (ap\ (\text{c\_2Emin\_2E\_3D}\ (2^2))\ (\lambda V0x \in 2.V0x))\ (\lambda V1x \in 2.V1$

Definition 5 *We define* c_2Ebool_2E_21 *to be* $\lambda A\_27a : \iota.(\lambda V0P \in (2^{A\_27a}).(ap\ (ap\ (\text{c\_2Emin\_2E\_3D}\ (2^{A\_27a}$

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.

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

$$(9)$$

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

Definition 8 *We define* c_2Earithmetic_2ENUMERAL *to be* $\lambda V0x \in ty\_2Enum\_2Enum.V0x.$

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

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

$$(10)$$

Let $c\_2Elist\_2ETAKE : \iota \Rightarrow \iota$ be given. Assume the following.

$$\forall A\_27a.nonempty\ A\_27a \Rightarrow c\_2Elist\_2ETAKE\ A\_27a \in (((ty\_2Elist\_2Elist$$
$$A\_27a)^{(ty\_2Elist\_2Elist\ A\_27a)})^{ty\_2Enum\_2Enum})$$

$$(11)$$

Definition 9 *We define* c_2Ebitstring_2Eshiftr *to be* $\lambda V0v \in (ty\_2Elist\_2Elist\ 2).\lambda V1m \in ty\_2Enum\_2Enu$

Let $c\_2Elist\_2EDROP : \iota \Rightarrow \iota$ be given. Assume the following.

$$\forall A\_27a.nonempty\ A\_27a \Rightarrow c\_2Elist\_2EDROP\ A\_27a \in (((ty\_2Elist\_2Elist$$
$$A\_27a)^{(ty\_2Elist\_2Elist\ A\_27a)})^{ty\_2Enum\_2Enum})$$

$$(12)$$

Definition 10 *We define* c_2Ebool_2EF *to be* $(ap\ (\text{c\_2Ebool\_2E\_21}\ 2)\ (\lambda V0t \in 2.V0t)).$

Definition 11 *We define* c_2Ecombin_2EK *to be* $\lambda A\_27a : \iota.\lambda A\_27b : \iota.(\lambda V0x \in A\_27a.(\lambda V1y \in A\_27b.V0x)$

Let $c\_2Elist\_2EGENLIST : \iota \Rightarrow \iota$ be given. Assume the following.

$$\forall A\_27a.nonempty\ A\_27a \Rightarrow c\_2Elist\_2EGENLIST\ A\_27a \in (((ty\_2Elist\_2Elist$$
$$A\_27a)^{ty\_2Enum\_2Enum})^{(A\_27a^{ty\_2Enum\_2Enum})})$$

$$(13)$$

Let $c\_2Elist\_2EAPPEND : \iota \Rightarrow \iota$ be given. Assume the following.

$$\forall A\_27a.nonempty\ A\_27a \Rightarrow c\_2Elist\_2EAPPEND\ A\_27a \in (((ty\_2Elist\_2Elist$$
$$A\_27a)^{(ty\_2Elist\_2Elist\ A\_27a)})^{(ty\_2Elist\_2Elist\ A\_27a)})$$

$$(14)$$

Definition 12 *We define* c_2Elist_2EPAD__LEFT *to be* $\lambda A\_27a : \iota.\lambda V0c \in A\_27a.\lambda V1n \in ty\_2Enum\_2Enum$

Definition 13 *We define* c_2Ebitstring_2Ezero__extend *to be* $\lambda V0n \in ty\_2Enum\_2Enum.\lambda V1v \in (ty\_2Elist$

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_7E *to be* $(\lambda V0t \in 2.(ap\ (ap\ \mathsf{c\_2Emin\_2E\_3D\_3D\_3E}\ V0t)\ \mathsf{c\_2Ebool\_2E}$

Definition 16 *We define* c_2Ebool_2E_2F_5C *to be* $(\lambda V0t1 \in 2.(\lambda V1t2 \in 2.(ap\ (\mathsf{c\_2Ebool\_2E\_21}\ 2)\ (\lambda V2t \in$

Definition 17 *We define* c_2Emin_2E_40 *to be* $\lambda A.\lambda P \in 2^A.\mathbf{if}\ (\exists x \in A.p\ (ap\ P\ x))\ \mathbf{then}\ (the\ (\lambda x.x \in A{\land}p$
of type $\iota{\Rightarrow}\iota$.

Definition 18 *We define* c_2Ebool_2E_3F *to be* $\lambda A\_27a : \iota.(\lambda V0P \in (2^{A\_27a}).(ap\ V0P\ (ap\ (\mathsf{c\_2Emin\_2E\_40}$

Definition 19 *We define* c_2Eprim__rec_2E_3C *to be* $\lambda V0m \in ty\_2Enum\_2Enum.\lambda V1n \in ty\_2Enum\_2Enu$

Definition 20 *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 21 *We define* c_2Ebool_2ELET *to be* $\lambda A\_27a : \iota.\lambda A\_27b : \iota.(\lambda V0f \in (A\_27b^{A\_27a}).(\lambda V1x \in A\_27$

Definition 22 *We define* c_2Ebitstring_2Efixwidth *to be* $\lambda V0n \in ty\_2Enum\_2Enum.\lambda V1v \in (ty\_2Elist\_2E$

Definition 23 *We define* c_2Ebitstring_2Efield *to be* $\lambda V0h \in ty\_2Enum\_2Enum.\lambda V1l \in ty\_2Enum\_2Enum$

Definition 24 *We define* c_2Ebool_2E_5C_2F *to be* $(\lambda V0t1 \in 2.(\lambda V1t2 \in 2.(ap\ (\mathsf{c\_2Ebool\_2E\_21}\ 2)\ (\lambda V2t \in$

Definition 25 *We define* c_2Ebitstring_2Erotate *to be* $\lambda V0v \in (ty\_2Elist\_2Elist\ 2).\lambda V1m \in ty\_2Enum\_2E$

Let $c\_2Elist\_2ENIL : \iota{\Rightarrow}\iota$ be given. Assume the following.

$$\forall A\_27a.nonempty\ A\_27a{\Rightarrow}c\_2Elist\_2ENIL\ A\_27a \in (ty\_2Elist\_2Elist$$
$$A\_27a)$$

$$(15)$$

Let $c\_2Elist\_2ECONS : \iota{\Rightarrow}\iota$ be given. Assume the following.

$$\forall A\_27a.nonempty\ A\_27a{\Rightarrow}c\_2Elist\_2ECONS\ A\_27a \in (((ty\_2Elist\_2Elist$$
$$A\_27a)^{(ty\_2Elist\_2Elist\ A\_27a)})^{A\_27a})$$

$$(16)$$

Definition 26 *We define* c_2Ebitstring_2Etestbit *to be* $\lambda V0b \in ty\_2Enum\_2Enum.\lambda V1v \in (ty\_2Elist\_2Elis$

Let $ty\_2Efcp\_2Efinite\_\_image : \iota{\Rightarrow}\iota$ be given. Assume the following.

$$\forall A0.nonempty\ A0{\Rightarrow}nonempty\ (ty\_2Efcp\_2Efinite\_\_image\ A0) \qquad (17)$$

Let $ty\_2Ebool\_2Eitself : \iota{\Rightarrow}\iota$ be given. Assume the following.

$$\forall A0.nonempty\ A0{\Rightarrow}nonempty\ (ty\_2Ebool\_2Eitself\ A0) \qquad (18)$$

Let $c\_2Ebool\_2Ethe\_\_value : \iota{\Rightarrow}\iota$ be given. Assume the following.

$$\forall A\_27a.nonempty\ A\_27a{\Rightarrow}c\_2Ebool\_2Ethe\_\_value\ A\_27a \in ($$
$$ty\_2Ebool\_2Eitself\ A\_27a)$$
$$(19)$$

Let $c\_2Efcp\_2Edimindex : \iota{\Rightarrow}\iota$ be given. Assume the following.

$$\forall A\_27a.nonempty\ A\_27a{\Rightarrow}c\_2Efcp\_2Edimindex\ A\_27a \in (ty\_2Enum\_2Enum^{(ty\_2Ebool\_2Eitself\ A\_27a)})$$
$$(20)$$

Definition 27 *We define* c_2Ebool_2E_3F_21 *to be* $\lambda A_27a : \iota.(\lambda V0P \in (2^{A_27a}).(ap\ (ap\ $c_2Ebool_2E_2F_5C

Definition 28 *We define* c_2Efcp_2Efinite_index *to be* $\lambda A\_27a : \iota.(ap\ ($c_2Emin_2E_40 $(A\_27a^{ty\_2Enum\_2Enu}$

Let $ty\_2Efcp\_2Ecart : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Assume the following.

$$\forall A0.nonempty\ A0 \Rightarrow \forall A1.nonempty\ A1 \Rightarrow nonempty\ (ty\_2Efcp\_2Ecart$$
$$A0\ A1)$$

(21)

Let $c\_2Efcp\_2Edest\_\_cart : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Assume the following.

$$\forall A\_27a.nonempty\ A\_27a \Rightarrow \forall A\_27b.nonempty\ A\_27b \Rightarrow c\_2Efcp\_2Edest\_\_cart$$
$$A\_27a\ A\_27b \in ((A\_27a^{(ty\_2Efcp\_2Efinite\_\_image\ A\_27b)})^{(ty\_2Efcp\_2Ecart\ A\_27a\ A\_27b)})$$

(22)

Definition 29 *We define* c_2Efcp_2Efcp__index *to be* $\lambda A\_27a : \iota.\lambda A\_27b : \iota.\lambda V0x \in (ty\_2Efcp\_2Ecart\ A\_27$

Definition 30 *We define* c_2Efcp_2EFCP *to be* $\lambda A\_27a : \iota.\lambda A\_27b : \iota.(\lambda V0g \in (A\_27a^{ty\_2Enum\_2Enum}).(ap\ ($

Definition 31 *We define* c_2Ebitstring_2Ev2w *to be* $\lambda A\_27a : \iota.\lambda V0v \in (ty\_2Elist\_2Elist\ 2).(ap\ ($c_2Efcp_2

Definition 32 *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 33 *We define* c_2Ecombin_2EI *to be* $\lambda A\_27a : \iota.(ap\ (ap\ ($c_2Ecombin_2ES $A\_27a\ (A\_27a^{A\_27a})\ A$

Definition 34 *We define* c_2Emarker_2EAbbrev *to be* $\lambda V0x \in 2.V0x.$

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

$$c\_2Earithmetic\_2EEVEN \in (2^{ty\_2Enum\_2Enum}) \qquad (23)$$

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

$$c\_2Earithmetic\_2EODD \in (2^{ty\_2Enum\_2Enum}) \qquad (24)$$

Definition 35 *We define* c_2Earithmetic_2E_3E *to be* $\lambda V0m \in ty\_2Enum\_2Enum.\lambda V1n \in ty\_2Enum\_2En$

Definition 36 *We define* c_2Earithmetic_2E_3E_3D *to be* $\lambda V0m \in ty\_2Enum\_2Enum.\lambda V1n \in ty\_2Enum\_2$

Definition 37 *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.

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

(25)

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

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

(26)

Definition 38 *We define* c_2Enumeral_2EiiSUC *to be* $\lambda V0n \in ty_2Enum_2Enum.(ap\ $c_2Enum_2ESUC $(ap\ $

Definition 39 *We define* c_2Enumeral_2EiZ *to be* $\lambda V0x \in ty\_2Enum\_2Enum.V0x$.

Definition 40 *We define* c_2Earithmetic_2EBIT2 *to be* $\lambda V0n \in ty\_2Enum\_2Enum.(ap\ (ap\ c\_2Earithmetic$

Let $c\_2Elist\_2EEL : \iota \Rightarrow \iota$ be given. Assume the following.

$$\forall A\_27a.nonempty\ A\_27a \Rightarrow c\_2Elist\_2EEL\ A\_27a \in ((A\_27a^{(ty\_2Elist\_2Elist\ A\_27a)})^{ty\_2Enum\_2Enum})$$

(27)

Definition 41 *We define* c_2Earithmetic_2EMIN *to be* $\lambda V0m \in ty\_2Enum\_2Enum.\lambda V1n \in ty\_2Enum\_2En$

Definition 42 *We define* c_2Earithmetic_2E_3C_3D *to be* $\lambda V0m \in ty\_2Enum\_2Enum.\lambda V1n \in ty\_2Enum\_2$

Definition 43 *We define* c_2Ewords_2Eword_bit *to be* $\lambda A\_27a : \iota.\lambda V0b \in ty\_2Enum\_2Enum.\lambda V1w \in (ty\_2$

Definition 44 *We define* c_2Ewords_2Eword_lsl *to be* $\lambda A\_27a : \iota.\lambda V0w \in (ty\_2Efcp\_2Ecart\ 2\ A\_27a).\lambda V1$

Definition 45 *We define* c_2Ewords_2Eword_bits *to be* $\lambda A\_27a : \iota.\lambda V0h \in ty\_2Enum\_2Enum.\lambda V1l \in ty\_2.$

Definition 46 *We define* c_2Ewords_2Eword_or *to be* $\lambda A\_27a : \iota.\lambda V0v \in (ty\_2Efcp\_2Ecart\ 2\ A\_27a).\lambda V1u$

Definition 47 *We define* c_2Ewords_2Eword_ror *to be* $\lambda A\_27a : \iota.\lambda V0w \in (ty\_2Efcp\_2Ecart\ 2\ A\_27a).\lambda V1$

Assume the following.

$$((ap\ \mathsf{c\_2Earithmetic\_2ENUMERAL}\ (ap\ \mathsf{c\_2Earithmetic\_2EBIT1}\ \mathsf{c\_2Earithmetic\_2EZERO})) = \\ (ap\ \mathsf{c\_2Enum\_2ESUC}\ \mathsf{c\_2Enum\_2E0}))$$

(28)

Assume the following.

$$((ap\ \mathsf{c\_2Earithmetic\_2ENUMERAL}\ (ap\ \mathsf{c\_2Earithmetic\_2EBIT2}\ \mathsf{c\_2Earithmetic\_2EZERO})) = \\ (ap\ \mathsf{c\_2Enum\_2ESUC}\ (ap\ \mathsf{c\_2Earithmetic\_2ENUMERAL}\ (ap\ \mathsf{c\_2Earithmetic\_2EBIT1} \\ \mathsf{c\_2Earithmetic\_2EZERO}))))$$

(29)

Assume the following.

$$(\forall V0m \in ty\_2Enum\_2Enum.((ap\ (ap\ c\_2Earithmetic\_2E\_2B\ V0m) \\ \mathsf{c\_2Enum\_2E0}) = V0m))$$

(30)

Assume the following.

$$(\forall V0m \in ty\_2Enum\_2Enum.(\forall V1n \in ty\_2Enum\_2Enum.(\\ ((ap\ (ap\ c\_2Earithmetic\_2E\_2B\ \mathsf{c\_2Enum\_2E0})\ V0m) = V0m) \wedge (((ap\ (\\ ap\ c\_2Earithmetic\_2E\_2B\ V0m)\ \mathsf{c\_2Enum\_2E0}) = V0m) \wedge (((ap\ (ap\ c\_2Earithmetic\_2E\_2B \\ (ap\ \mathsf{c\_2Enum\_2ESUC}\ V0m))\ V1n) = (ap\ \mathsf{c\_2Enum\_2ESUC}\ (ap\ (ap\ c\_2Earithmetic\_2E\_2B \\ V0m)\ V1n))) \wedge ((ap\ (ap\ c\_2Earithmetic\_2E\_2B\ V0m)\ (ap\ \mathsf{c\_2Enum\_2ESUC} \\ V1n)) = (ap\ \mathsf{c\_2Enum\_2ESUC}\ (ap\ (ap\ c\_2Earithmetic\_2E\_2B\ V0m)\ V1n))))))))))$$

(31)

Assume the following.

$$(\forall V0m \in ty\_2Enum\_2Enum.(\forall V1n \in ty\_2Enum\_2Enum.($$
$$(ap\ (ap\ c\_2Earithmetic\_2E\_2B\ V0m)\ V1n) = (ap\ (ap\ c\_2Earithmetic\_2E\_2B$$
$$V1n)\ V0m))))$$
(32)

Assume the following.

$$(\forall V0m \in ty\_2Enum\_2Enum.(\forall V1n \in ty\_2Enum\_2Enum.($$
$$(ap\ (ap\ c\_2Earithmetic\_2E\_2B\ V0m)\ V1n) = (ap\ (ap\ c\_2Earithmetic\_2E\_2B$$
$$V1n)\ V0m))))$$
(33)

Assume the following.

$$(\forall V0m \in ty\_2Enum\_2Enum.(\forall V1n \in ty\_2Enum\_2Enum.($$
$$\forall V2p \in ty\_2Enum\_2Enum.((ap\ (ap\ c\_2Earithmetic\_2E\_2B\ V0m)$$
$$(ap\ (ap\ c\_2Earithmetic\_2E\_2B\ V1n)\ V2p)) = (ap\ (ap\ c\_2Earithmetic\_2E\_2B$$
$$(ap\ (ap\ c\_2Earithmetic\_2E\_2B\ V0m)\ V1n))\ V2p)))))$$
(34)

Assume the following.

$$(\forall V0m \in ty\_2Enum\_2Enum.(\forall V1n \in ty\_2Enum\_2Enum.($$
$$(p\ (ap\ (ap\ \mathsf{c\_2Eprim\_rec\_2E\_3C}\ V0m)\ V1n)) \Leftrightarrow (p\ (ap\ (ap\ \mathsf{c\_2Earithmetic\_2E\_3C\_3D}$$
$$(ap\ \mathsf{c\_2Enum\_2ESUC}\ V0m))\ V1n)))))$$
(35)

Assume the following.

$$(\forall V0n \in ty\_2Enum\_2Enum.(p\ (ap\ (ap\ \mathsf{c\_2Earithmetic\_2E\_3C\_3D}$$
$$\mathsf{c\_2Enum\_2E0})\ V0n)))$$
(36)

Assume the following.

$$(\forall V0m \in ty\_2Enum\_2Enum.(\forall V1n \in ty\_2Enum\_2Enum.($$
$$(\neg(p\ (ap\ (ap\ \mathsf{c\_2Eprim\_rec\_2E\_3C}\ V0m)\ V1n))) \Leftrightarrow (p\ (ap\ (ap\ \mathsf{c\_2Earithmetic\_2E\_3C\_3D}$$
$$V1n)\ V0m)))))$$
(37)

Assume the following.

$$(\forall V0n \in ty\_2Enum\_2Enum.((p\ (ap\ (ap\ \mathsf{c\_2Earithmetic\_2E\_3C\_3D}$$
$$V0n)\ \mathsf{c\_2Enum\_2E0})) \Leftrightarrow (V0n = \mathsf{c\_2Enum\_2E0})))$$
(38)

Assume the following.

$$(\forall V0m \in ty\_2Enum\_2Enum.(((ap\ (ap\ c\_2Earithmetic\_2E\_2D$$
$$\mathsf{c\_2Enum\_2E0})\ V0m) = \mathsf{c\_2Enum\_2E0}) \wedge ((ap\ (ap\ c\_2Earithmetic\_2E\_2D$$
$$V0m)\ \mathsf{c\_2Enum\_2E0}) = V0m)))$$
(39)

Assume the following.

$$(\forall V0m \in ty\_2Enum\_2Enum.((ap \ \textsf{c\_2Enum\_2ESUC} \ V0m) = (ap \ (ap$$
$$c\_2Earithmetic\_2E\_2B \ V0m) \ (ap \ \textsf{c\_2Earithmetic\_2ENUMERAL} \ (ap \ \textsf{c\_2Earithmetic\_2EBIT1}$$
$$\textsf{c\_2Earithmetic\_2EZERO})))))$$

(40)

Assume the following.

$$(\forall V0m \in ty\_2Enum\_2Enum.((ap \ (ap \ c\_2Earithmetic\_2E\_2A \ ($$
$$ap \ \textsf{c\_2Earithmetic\_2ENUMERAL} \ (ap \ \textsf{c\_2Earithmetic\_2EBIT1} \ \textsf{c\_2Earithmetic\_2EZERO})))$$
$$V0m) = V0m))$$

(41)

Assume the following.

$$(\forall V0m \in ty\_2Enum\_2Enum.(\forall V1n \in ty\_2Enum\_2Enum.($$
$$((ap \ (ap \ c\_2Earithmetic\_2E\_2A \ \textsf{c\_2Enum\_2E0}) \ V0m) = \textsf{c\_2Enum\_2E0}) \wedge$$
$$(((ap \ (ap \ c\_2Earithmetic\_2E\_2A \ V0m) \ \textsf{c\_2Enum\_2E0}) = \textsf{c\_2Enum\_2E0}) \wedge$$
$$(((ap \ (ap \ c\_2Earithmetic\_2E\_2A \ (ap \ \textsf{c\_2Earithmetic\_2ENUMERAL}$$
$$(ap \ \textsf{c\_2Earithmetic\_2EBIT1} \ \textsf{c\_2Earithmetic\_2EZERO}))) \ V0m) = V0m) \wedge$$
$$(((ap \ (ap \ c\_2Earithmetic\_2E\_2A \ V0m) \ (ap \ \textsf{c\_2Earithmetic\_2ENUMERAL}$$
$$(ap \ \textsf{c\_2Earithmetic\_2EBIT1} \ \textsf{c\_2Earithmetic\_2EZERO}))) = V0m) \wedge ($$
$$((ap \ (ap \ c\_2Earithmetic\_2E\_2A \ (ap \ \textsf{c\_2Enum\_2ESUC} \ V0m)) \ V1n) = (ap$$
$$(ap \ c\_2Earithmetic\_2E\_2B \ (ap \ (ap \ c\_2Earithmetic\_2E\_2A \ V0m) \ V1n))$$
$$V1n)) \wedge ((ap \ (ap \ c\_2Earithmetic\_2E\_2A \ V0m) \ (ap \ \textsf{c\_2Enum\_2ESUC} \ V1n)) =$$
$$(ap \ (ap \ c\_2Earithmetic\_2E\_2B \ V0m) \ (ap \ (ap \ c\_2Earithmetic\_2E\_2A$$
$$V0m) \ V1n)))))))))))$$

(42)

Assume the following.

$$(\forall V0m \in ty\_2Enum\_2Enum.(\forall V1n \in ty\_2Enum\_2Enum.($$
$$\forall V2p \in ty\_2Enum\_2Enum.((ap \ (ap \ c\_2Earithmetic\_2E\_2A \ (ap$$
$$(ap \ c\_2Earithmetic\_2E\_2B \ V0m) \ V1n)) \ V2p) = (ap \ (ap \ c\_2Earithmetic\_2E\_2B$$
$$(ap \ (ap \ c\_2Earithmetic\_2E\_2A \ V0m) \ V2p)) \ (ap \ (ap \ c\_2Earithmetic\_2E\_2A$$
$$V1n) \ V2p))))))$$

(43)

Assume the following.

$$(\forall V0m \in ty\_2Enum\_2Enum.(\forall V1n \in ty\_2Enum\_2Enum.($$
$$\forall V2p \in ty\_2Enum\_2Enum.((ap \ (ap \ c\_2Earithmetic\_2E\_2A \ V2p)$$
$$(ap \ (ap \ c\_2Earithmetic\_2E\_2B \ V0m) \ V1n)) = (ap \ (ap \ c\_2Earithmetic\_2E\_2B$$
$$(ap \ (ap \ c\_2Earithmetic\_2E\_2A \ V2p) \ V0m)) \ (ap \ (ap \ c\_2Earithmetic\_2E\_2A$$
$$V2p) \ V1n))))))$$

(44)

Assume the following.

$$(\forall V0m \in ty\_2Enum\_2Enum.(\forall V1n \in ty\_2Enum\_2Enum.($$
$$\forall V2p \in ty\_2Enum\_2Enum.((ap\ (ap\ c\_2Earithmetic\_2E\_2A\ V0m)$$
$$(ap\ (ap\ c\_2Earithmetic\_2E\_2A\ V1n)\ V2p)) = (ap\ (ap\ c\_2Earithmetic\_2E\_2A$$
$$(ap\ (ap\ c\_2Earithmetic\_2E\_2A\ V0m)\ V1n))\ V2p)))))$$

(45)

Assume the following.

$$(\forall V0m \in ty\_2Enum\_2Enum.(\forall V1n \in ty\_2Enum\_2Enum.($$
$$((ap\ (ap\ c\_2Earithmetic\_2E\_2B\ V0m)\ V1n) = \mathsf{c\_2Enum\_2E0}) \Leftrightarrow ((V0m =$$
$$\mathsf{c\_2Enum\_2E0}) \wedge (V1n = \mathsf{c\_2Enum\_2E0}))))))$$

(46)

Assume the following.

$$(\forall V0m \in ty\_2Enum\_2Enum.(\forall V1n \in ty\_2Enum\_2Enum.($$
$$\forall V2p \in ty\_2Enum\_2Enum.((p\ (ap\ (ap\ \mathsf{c\_2Eprim\_\_rec\_2E\_3C}\ ($$
$$ap\ (ap\ c\_2Earithmetic\_2E\_2B\ V0m)\ V2p))\ (ap\ (ap\ c\_2Earithmetic\_2E\_2B$$
$$V1n)\ V2p))) \Leftrightarrow (p\ (ap\ (ap\ \mathsf{c\_2Eprim\_\_rec\_2E\_3C}\ V0m)\ V1n))))))$$

(47)

Assume the following.

$$(\forall V0m \in ty\_2Enum\_2Enum.(\forall V1n \in ty\_2Enum\_2Enum.($$
$$\forall V2p \in ty\_2Enum\_2Enum.(((p\ (ap\ (ap\ \mathsf{c\_2Earithmetic\_2E\_3C\_3D}$$
$$V0m)\ V1n)) \wedge (p\ (ap\ (ap\ \mathsf{c\_2Earithmetic\_2E\_3C\_3D}\ V1n)\ V2p))) \Rightarrow (p\ ($$
$$ap\ (ap\ \mathsf{c\_2Earithmetic\_2E\_3C\_3D}\ V0m)\ V2p))))))$$

(48)

Assume the following.

$$(\forall V0m \in ty\_2Enum\_2Enum.(\forall V1n \in ty\_2Enum\_2Enum.($$
$$(p\ (ap\ (ap\ \mathsf{c\_2Eprim\_\_rec\_2E\_3C}\ V1n)\ V0m)) \Rightarrow (\exists V2p \in ty\_2Enum\_2Enum.$$
$$(V0m = (ap\ (ap\ c\_2Earithmetic\_2E\_2B\ V1n)\ (ap\ (ap\ c\_2Earithmetic\_2E\_2B$$
$$V2p)\ (ap\ \mathsf{c\_2Earithmetic\_2ENUMERAL}\ (ap\ \mathsf{c\_2Earithmetic\_2EBIT1}$$
$$\mathsf{c\_2Earithmetic\_2EZERO}))))))))))$$

(49)

Assume the following.

$$(\forall V0a \in ty\_2Enum\_2Enum.((ap\ (ap\ c\_2Earithmetic\_2E\_2D\ ($$
$$ap\ \mathsf{c\_2Enum\_2ESUC}\ V0a))\ V0a) = (ap\ \mathsf{c\_2Earithmetic\_2ENUMERAL}\ (ap$$
$$\mathsf{c\_2Earithmetic\_2EBIT1}\ \mathsf{c\_2Earithmetic\_2EZERO}))))$$

(50)

Assume the following.

$$(\forall V0a \in ty\_2Enum\_2Enum.(\forall V1c \in ty\_2Enum\_2Enum.($$
$$(ap\ (ap\ c\_2Earithmetic\_2E\_2D\ (ap\ (ap\ c\_2Earithmetic\_2E\_2B\ V0a)$$
$$V1c))\ V1c) = V0a)))$$

(51)

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Assume the following.

$$(\forall V0m \in ty\_2Enum\_2Enum.(\forall V1n \in ty\_2Enum\_2Enum.(\\ (V0m = V1n) \Leftrightarrow ((p \ (ap \ (ap \ \mathsf{c\_2Earithmetic\_2E\_3C\_3D} \ V0m) \ V1n)) \wedge (p \ (\\ ap \ (ap \ \mathsf{c\_2Earithmetic\_2E\_3C\_3D} \ V1n) \ V0m)))))) \tag{52}$$

Assume the following.

$$(\forall V0m \in ty\_2Enum\_2Enum.(\forall V1n \in ty\_2Enum\_2Enum.(\\ \forall V2p \in ty\_2Enum\_2Enum.((p \ (ap \ (ap \ \mathsf{c\_2Earithmetic\_2E\_3C\_3D} \\ (ap \ (ap \ c\_2Earithmetic\_2E\_2B \ V0m) \ V1n)) \ (ap \ (ap \ c\_2Earithmetic\_2E\_2B \\ V0m) \ V2p))) \Leftrightarrow (p \ (ap \ (ap \ \mathsf{c\_2Earithmetic\_2E\_3C\_3D} \ V1n) \ V2p)))))) \tag{53}$$

Assume the following.

$$(\forall V0m \in ty\_2Enum\_2Enum.(\forall V1n \in ty\_2Enum\_2Enum.(\\ (\neg(p \ (ap \ (ap \ \mathsf{c\_2Earithmetic\_2E\_3C\_3D} \ V0m) \ V1n))) \Leftrightarrow (p \ (ap \ (ap \ \mathsf{c\_2Earithmetic\_2E\_3C\_3D} \\ (ap \ \mathsf{c\_2Enum\_2ESUC} \ V1n)) \ V0m))))) \tag{54}$$

Assume the following.

$$(\forall V0m \in ty\_2Enum\_2Enum.(\forall V1n \in ty\_2Enum\_2Enum.(\\ (\neg(V0m = V1n)) \Leftrightarrow ((p \ (ap \ (ap \ \mathsf{c\_2Earithmetic\_2E\_3C\_3D} \ (ap \ \mathsf{c\_2Enum\_2ESUC} \\ V0m)) \ V1n)) \vee (p \ (ap \ (ap \ \mathsf{c\_2Earithmetic\_2E\_3C\_3D} \ (ap \ \mathsf{c\_2Enum\_2ESUC} \\ V1n)) \ V0m)))))) \tag{55}$$

Assume the following.

$$(\forall V0n \in ty\_2Enum\_2Enum.((ap \ \mathsf{c\_2Enum\_2ESUC} \ V0n) = (ap \ (ap \\ c\_2Earithmetic\_2E\_2B \ (ap \ \mathsf{c\_2Earithmetic\_2ENUMERAL} \ (ap \ \mathsf{c\_2Earithmetic\_2EBIT1} \\ \mathsf{c\_2Earithmetic\_2EZERO}))) \ V0n))) \tag{56}$$

Assume the following.

$$(\forall V0m \in ty\_2Enum\_2Enum.(\forall V1n \in ty\_2Enum\_2Enum.(\\ \forall V2p \in ty\_2Enum\_2Enum.((p \ (ap \ (ap \ \mathsf{c\_2Earithmetic\_2E\_3C\_3D} \\ V0m) \ V1n)) \Leftrightarrow (p \ (ap \ (ap \ \mathsf{c\_2Earithmetic\_2E\_3C\_3D} \ (ap \ (ap \ c\_2Earithmetic\_2E\_2A \\ (ap \ \mathsf{c\_2Enum\_2ESUC} \ V2p)) \ V0m)) \ (ap \ (ap \ c\_2Earithmetic\_2E\_2A \ (ap \\ \mathsf{c\_2Enum\_2ESUC} \ V2p)) \ V1n))))))) \tag{57}$$

Assume the following.

$$(\forall V0m \in ty\_2Enum\_2Enum.(\forall V1n \in ty\_2Enum\_2Enum.(\\ ((p \ (ap \ (ap \ \mathsf{c\_2Earithmetic\_2E\_3C\_3D} \ V0m) \ (ap \ (ap \ c\_2Earithmetic\_2E\_2A \\ V0m) \ V1n))) \Leftrightarrow ((V0m = \mathsf{c\_2Enum\_2E0}) \vee (p \ (ap \ (ap \ \mathsf{c\_2Eprim\_rec\_2E\_3C} \\ \mathsf{c\_2Enum\_2E0}) \ V1n)))) \wedge ((p \ (ap \ (ap \ \mathsf{c\_2Earithmetic\_2E\_3C\_3D} \ V0m) \\ (ap \ (ap \ c\_2Earithmetic\_2E\_2A \ V1n) \ V0m))) \Leftrightarrow ((V0m = \mathsf{c\_2Enum\_2E0}) \vee \\ (p \ (ap \ (ap \ \mathsf{c\_2Eprim\_rec\_2E\_3C} \ \mathsf{c\_2Enum\_2E0}) \ V1n))))))) \tag{58}$$

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Assume the following.

$$(\forall V0m \in ty\_2Enum\_2Enum.(\forall V1n \in ty\_2Enum\_2Enum.(\\ \forall V2p \in ty\_2Enum\_2Enum.((ap\ (ap\ c\_2Earithmetic\_2E\_2D\ (ap\\ (ap\ c\_2Earithmetic\_2E\_2D\ V0m)\ V1n))\ V2p) = (ap\ (ap\ c\_2Earithmetic\_2E\_2D\\ V0m)\ (ap\ (ap\ c\_2Earithmetic\_2E\_2B\ V1n)\ V2p))))))$$

(59)

Assume the following.

$$(\forall V0m \in ty\_2Enum\_2Enum.(\forall V1n \in ty\_2Enum\_2Enum.(\\ \forall V2p \in ty\_2Enum\_2Enum.((p\ (ap\ (ap\ \mathsf{c\_2Earithmetic\_2E\_3C\_3D}\\ V0m)\ (ap\ (ap\ c\_2Earithmetic\_2E\_2D\ V1n)\ V2p)))\Leftrightarrow((p\ (ap\ (ap\ \mathsf{c\_2Earithmetic\_2E\_3C\_3D}\\ (ap\ (ap\ c\_2Earithmetic\_2E\_2B\ V0m)\ V2p))\ V1n))\vee(p\ (ap\ (ap\ \mathsf{c\_2Earithmetic\_2E\_3C\_3D}\\ V0m)\ \mathsf{c\_2Enum\_2E0}))))))))$$

(60)

Assume the following.

$$(\forall V0m \in ty\_2Enum\_2Enum.(\forall V1n \in ty\_2Enum\_2Enum.(\\ \forall V2p \in ty\_2Enum\_2Enum.((p\ (ap\ (ap\ \mathsf{c\_2Earithmetic\_2E\_3C\_3D}\\ (ap\ (ap\ c\_2Earithmetic\_2E\_2D\ V0m)\ V1n))\ V2p))\Leftrightarrow(p\ (ap\ (ap\ \mathsf{c\_2Earithmetic\_2E\_3C\_3D}\\ V0m)\ (ap\ (ap\ c\_2Earithmetic\_2E\_2B\ V1n)\ V2p)))))))$$

(61)

Assume the following.

$$(\forall V0m \in ty\_2Enum\_2Enum.(\forall V1n \in ty\_2Enum\_2Enum.(\\ \forall V2p \in ty\_2Enum\_2Enum.((p\ (ap\ (ap\ \mathsf{c\_2Eprim\_rec\_2E\_3C}\ V0m)\\ (ap\ (ap\ c\_2Earithmetic\_2E\_2D\ V1n)\ V2p)))\Leftrightarrow(p\ (ap\ (ap\ \mathsf{c\_2Eprim\_rec\_2E\_3C}\\ (ap\ (ap\ c\_2Earithmetic\_2E\_2B\ V0m)\ V2p))\ V1n))))))$$

(62)

Assume the following.

$$(\forall V0m \in ty\_2Enum\_2Enum.(\forall V1n \in ty\_2Enum\_2Enum.(\\ \forall V2p \in ty\_2Enum\_2Enum.((p\ (ap\ (ap\ \mathsf{c\_2Eprim\_rec\_2E\_3C}\ (\\ ap\ (ap\ c\_2Earithmetic\_2E\_2D\ V0m)\ V1n))\ V2p))\Leftrightarrow((p\ (ap\ (ap\ \mathsf{c\_2Eprim\_rec\_2E\_3C}\\ V0m)\ (ap\ (ap\ c\_2Earithmetic\_2E\_2B\ V1n)\ V2p)))\wedge(p\ (ap\ (ap\ \mathsf{c\_2Eprim\_rec\_2E\_3C}\\ \mathsf{c\_2Enum\_2E0})\ V2p)))))))$$

(63)

Assume the following.

$$(\forall V0m \in ty\_2Enum\_2Enum.(\forall V1n \in ty\_2Enum\_2Enum.(\\ (p\ (ap\ (ap\ \mathsf{c\_2Eprim\_rec\_2E\_3C}\ \mathsf{c\_2Enum\_2E0})\ V1n))\Rightarrow(p\ (ap\ (ap\ \mathsf{c\_2Eprim\_rec\_2E\_3C}\\ (ap\ (ap\ c\_2Earithmetic\_2EMOD\ V0m)\ V1n))\ V1n)))))$$

(64)

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Assume the following.

$$(\forall V0P \in (2^{ty\_2Enum\_2Enum})).(\forall V1a \in ty\_2Enum\_2Enum.$$
$$(\forall V2b \in ty\_2Enum\_2Enum.((p\ (ap\ V0P\ (ap\ (ap\ c\_2Earithmetic\_2E\_2D$$
$$V1a)\ V2b)))\Leftrightarrow(\forall V3d \in ty\_2Enum\_2Enum.(((V2b = (ap\ (ap\ c\_2Earithmetic\_2E\_2B$$
$$V1a)\ V3d))\Rightarrow(p\ (ap\ V0P\ \textsf{c\_2Enum\_2E0)))}\wedge((V1a = (ap\ (ap\ c\_2Earithmetic\_2E\_2B$$
$$V2b)\ V3d))\Rightarrow(p\ (ap\ V0P\ V3d)))))))))) \tag{65}$$

Assume the following.

$$(\forall V0n \in ty\_2Enum\_2Enum.(\forall V1m \in ty\_2Enum\_2Enum.($$
$$\forall V2p \in ty\_2Enum\_2Enum.(((p\ (ap\ (ap\ \textsf{c\_2Earithmetic\_2E\_3C\_3D}$$
$$(ap\ (ap\ \textsf{c\_2Earithmetic\_2EMIN}\ V1m)\ V0n))\ V2p))\Leftrightarrow((p\ (ap\ (ap\ \textsf{c\_2Earithmetic\_2E\_3C\_3D}$$
$$V1m)\ V2p))\vee(p\ (ap\ (ap\ \textsf{c\_2Earithmetic\_2E\_3C\_3D}\ V0n)\ V2p))))\wedge((($$
$$p\ (ap\ (ap\ \textsf{c\_2Earithmetic\_2E\_3C\_3D}\ V2p)\ (ap\ (ap\ \textsf{c\_2Earithmetic\_2EMIN}$$
$$V1m)\ V0n)))\Leftrightarrow((p\ (ap\ (ap\ \textsf{c\_2Earithmetic\_2E\_3C\_3D}\ V2p)\ V1m))\wedge(p$$
$$(ap\ (ap\ \textsf{c\_2Earithmetic\_2E\_3C\_3D}\ V2p)\ V0n)))))))))) \tag{66}$$

Assume the following.

$$(\forall V0n \in ty\_2Enum\_2Enum.(\forall V1v \in (ty\_2Elist\_2Elist$$
$$2).((ap\ (c\_2Elist\_2ELENGTH\ 2)\ (ap\ (ap\ \textsf{c\_2Ebitstring\_2Efixwidth} \tag{67}$$
$$V0n)\ V1v)) = V0n)))$$

Assume the following.

$$(\forall V0h \in ty\_2Enum\_2Enum.(\forall V1l \in ty\_2Enum\_2Enum.($$
$$\forall V2v \in (ty\_2Elist\_2Elist\ 2).((ap\ (c\_2Elist\_2ELENGTH\ 2)$$
$$(ap\ (ap\ (ap\ \textsf{c\_2Ebitstring\_2Efield}\ V0h)\ V1l)\ V2v)) = (ap\ (ap\ c\_2Earithmetic\_2E\_2D$$
$$(ap\ \textsf{c\_2Enum\_2ESUC}\ V0h))\ V1l))))) \tag{68}$$

Assume the following.

$$(\forall V0i \in ty\_2Enum\_2Enum.(\forall V1n \in ty\_2Enum\_2Enum.($$
$$\forall V2w \in (ty\_2Elist\_2Elist\ 2).((p\ (ap\ (ap\ \textsf{c\_2Eprim\_rec\_2E\_3C}$$
$$V0i)\ V1n))\Rightarrow((p\ (ap\ (ap\ (c\_2Elist\_2EEL\ 2)\ V0i)\ (ap\ (ap\ \textsf{c\_2Ebitstring\_2Efixwidth}$$
$$V1n)\ V2w)))\Leftrightarrow(p\ (ap\ (ap\ (ap\ (c\_2Ebool\_2ECOND\ 2)\ (ap\ (ap\ \textsf{c\_2Eprim\_rec\_2E\_3C}$$
$$(ap\ (c\_2Elist\_2ELENGTH\ 2)\ V2w))\ V1n))\ (ap\ (ap\ \textsf{c\_2Ebool\_2E\_2F\_5C}$$
$$(ap\ (ap\ \textsf{c\_2Earithmetic\_2E\_3C\_3D}\ (ap\ (ap\ c\_2Earithmetic\_2E\_2D$$
$$V1n)\ (ap\ (c\_2Elist\_2ELENGTH\ 2)\ V2w)))\ V0i))\ (ap\ (ap\ (c\_2Elist\_2EEL$$
$$2)\ (ap\ (ap\ c\_2Earithmetic\_2E\_2D\ V0i)\ (ap\ (ap\ c\_2Earithmetic\_2E\_2D$$
$$V1n)\ (ap\ (c\_2Elist\_2ELENGTH\ 2)\ V2w))))\ V2w)))\ (ap\ (ap\ (c\_2Elist\_2EEL$$
$$2)\ (ap\ (ap\ c\_2Earithmetic\_2E\_2B\ V0i)\ (ap\ (ap\ c\_2Earithmetic\_2E\_2D$$
$$(ap\ (c\_2Elist\_2ELENGTH\ 2)\ V2w))\ V1n)))\ V2w)))))))) \tag{69}$$

Assume the following.

$$(\forall V0v \in (ty\_2Elist\_2Elist\ 2).(\forall V1h \in ty\_2Enum\_2Enum.$$
$$(\forall V2l \in ty\_2Enum\_2Enum.(\forall V3i \in ty\_2Enum\_2Enum.($$
$$(p\ (ap\ (ap\ \mathsf{c\_2Eprim\_\_rec\_2E\_3C}\ V3i)\ (ap\ (ap\ c\_2Earithmetic\_2E\_2D$$
$$(ap\ \mathsf{c\_2Enum\_2ESUC}\ V1h))\ V2l)))\Rightarrow((p\ (ap\ (ap\ (c\_2Elist\_2EEL\ 2)\ V3i)$$
$$(ap\ (ap\ (ap\ \mathsf{c\_2Ebitstring\_2Efield}\ V1h)\ V2l)\ V0v)))\Leftrightarrow((p\ (ap\ (ap\ \mathsf{c\_2Earithmetic\_2E\_3C\_3D}$$
$$(ap\ \mathsf{c\_2Enum\_2ESUC}\ V1h))\ (ap\ (ap\ c\_2Earithmetic\_2E\_2B\ V3i)\ (ap\ ($$
$$c\_2Elist\_2ELENGTH\ 2)\ V0v))))\wedge(p\ (ap\ (ap\ (c\_2Elist\_2EEL\ 2)\ (ap$$
$$(ap\ c\_2Earithmetic\_2E\_2D\ (ap\ (ap\ c\_2Earithmetic\_2E\_2B\ V3i)\ (ap$$
$$(c\_2Elist\_2ELENGTH\ 2)\ V0v))\ (ap\ \mathsf{c\_2Enum\_2ESUC}\ V1h)))\ V0v)))))))))$$

$$(70)$$

Assume the following.

$$(\forall V0b \in ty\_2Enum\_2Enum.(\forall V1v \in (ty\_2Elist\_2Elist$$
$$2).((p\ (ap\ (ap\ \mathsf{c\_2Ebitstring\_2Etestbit}\ V0b)\ V1v))\Leftrightarrow(p\ (ap\ (ap\ ($$
$$\mathsf{c\_2Ebool\_2ELET}\ ty\_2Enum\_2Enum\ 2)\ (\lambda V2n \in ty\_2Enum\_2Enum.$$
$$(ap\ (ap\ \mathsf{c\_2Ebool\_2E\_2F\_5C}\ (ap\ (ap\ \mathsf{c\_2Eprim\_\_rec\_2E\_3C}\ V0b)\ V2n))$$
$$(ap\ (ap\ (c\_2Elist\_2EEL\ 2)\ (ap\ (ap\ c\_2Earithmetic\_2E\_2D\ (ap\ (ap$$
$$c\_2Earithmetic\_2E\_2D\ V2n)\ (ap\ \mathsf{c\_2Earithmetic\_2ENUMERAL}\ (ap\ \mathsf{c\_2Earithmetic\_2EBIT1}$$
$$\mathsf{c\_2Earithmetic\_2EZERO}))))\ V0b))\ V1v))))\ (ap\ (c\_2Elist\_2ELENGTH$$
$$2)\ V1v))))))$$

$$(71)$$

Assume the following.

$$\forall A\_27a.nonempty\ A\_27a\Rightarrow(\forall V0n \in ty\_2Enum\_2Enum.($$
$$\forall V1v \in (ty\_2Elist\_2Elist\ 2).((p\ (ap\ (ap\ \mathsf{c\_2Ewords\_2Eword\_\_bit}$$
$$A\_27a)\ V0n)\ (ap\ (c\_2Ebitstring\_2Ev2w\ A\_27a)\ V1v)))\Leftrightarrow((p\ (ap\ (ap$$
$$\mathsf{c\_2Eprim\_\_rec\_2E\_3C}\ V0n)\ (ap\ (c\_2Efcp\_2Edimindex\ A\_27a)\ (c\_2Ebool\_2Ethe\_\_value$$
$$A\_27a))))\wedge(p\ (ap\ (ap\ \mathsf{c\_2Ebitstring\_2Etestbit}\ V0n)\ V1v))))))$$

$$(72)$$

Assume the following.

$$\forall A\_27a.nonempty\ A\_27a\Rightarrow(\forall V0v \in (ty\_2Elist\_2Elist$$
$$2).((ap\ (c\_2Ebitstring\_2Ev2w\ A\_27a)\ (ap\ (ap\ \mathsf{c\_2Ebitstring\_2Efixwidth}$$
$$(ap\ (c\_2Efcp\_2Edimindex\ A\_27a)\ (c\_2Ebool\_2Ethe\_\_value\ A\_27a)))$$
$$V0v)) = (ap\ (\mathsf{c\_2Ebitstring\_2Ev2w}\ A\_27a)\ V0v)))$$

$$(73)$$

Assume the following.

$$True \tag{74}$$

Assume the following.

$$(\forall V0t1 \in 2.(\forall V1t2 \in 2.(((p\ V0t1)\Rightarrow(p\ V1t2))\Rightarrow(((p$$
$$V1t2)\Rightarrow(p\ V0t1))\Rightarrow((p\ V0t1)\Leftrightarrow(p\ V1t2)))))) \tag{75}$$

Assume the following.

$$(\forall V0t \in 2.(False\Rightarrow(p\ V0t))) \tag{76}$$

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Assume the following.

$$(\forall V0t \in 2.((p\ V0t)\vee(\neg(p\ V0t)))) \tag{77}$$

Assume the following.

$$\forall A\_27a.nonempty\ A\_27a{\Rightarrow}\forall A\_27b.nonempty\ A\_27b{\Rightarrow}($$
$$\forall V0f \in (A\_27b^{A\_27a}).(\forall V1x \in A\_27a.((ap\ (ap\ (\mathsf{c\_2Ebool\_2ELET} \tag{78}$$
$$A\_27a\ A\_27b)\ V0f)\ V1x) = (ap\ V0f\ V1x))))$$

Assume the following.

$$\forall A\_27a.nonempty\ A\_27a{\Rightarrow}(\forall V0t \in 2.((\forall V1x \in$$
$$A\_27a.(p\ V0t)){\Leftrightarrow}(p\ V0t))) \tag{79}$$

Assume the following.

$$(\forall V0t1 \in 2.(\forall V1t2 \in 2.(\forall V2t3 \in 2.(((p\ V0t1)\wedge$$
$$((p\ V1t2)\wedge(p\ V2t3))){\Leftrightarrow}(((p\ V0t1)\wedge(p\ V1t2))\wedge(p\ V2t3)))))) \tag{80}$$

Assume the following.

$$(\forall V0t \in 2.(((True\wedge(p\ V0t)){\Leftrightarrow}(p\ V0t))\wedge((((p\ V0t)\wedge True{\Leftrightarrow}$$
$$(p\ V0t))\wedge(((False\wedge(p\ V0t)){\Leftrightarrow}False)\wedge((((p\ V0t)\wedge False){\Leftrightarrow}False)\wedge \tag{81}$$
$$(((p\ V0t)\wedge(p\ V0t)){\Leftrightarrow}(p\ V0t)))))))$$

Assume the following.

$$(\forall V0t \in 2.(((True\vee(p\ V0t)){\Leftrightarrow}True)\wedge((((p\ V0t)\vee True){\Leftrightarrow}True)\wedge$$
$$(((False\vee(p\ V0t)){\Leftrightarrow}(p\ V0t))\wedge((((p\ V0t)\vee False){\Leftrightarrow}(p\ V0t))\wedge(((p\ V0t)\vee$$
$$(p\ V0t)){\Leftrightarrow}(p\ V0t)))))))$$
$$\tag{82}$$

Assume the following.

$$(\forall V0t \in 2.(((True{\Rightarrow}(p\ V0t)){\Leftrightarrow}(p\ V0t))\wedge((((p\ V0t){\Rightarrow}True){\Leftrightarrow}$$
$$True)\wedge(((False{\Rightarrow}(p\ V0t)){\Leftrightarrow}True)\wedge((((p\ V0t){\Rightarrow}(p\ V0t)){\Leftrightarrow}True)\wedge((\tag{83}$$
$$(p\ V0t){\Rightarrow}False){\Leftrightarrow}(\neg(p\ V0t)))))))))$$

Assume the following.

$$((\forall V0t \in 2.((\neg(\neg(p\ V0t))){\Leftrightarrow}(p\ V0t)))\wedge(((\neg True){\Leftrightarrow}False)\wedge$$
$$((\neg False){\Leftrightarrow}True))) \tag{84}$$

Assume the following.

$$\forall A\_27a.nonempty\ A\_27a{\Rightarrow}(\forall V0x \in A\_27a.((V0x = V0x){\Leftrightarrow}$$
$$True)) \tag{85}$$

Assume the following.

$$\forall A\_27a.nonempty\ A\_27a{\Rightarrow}(\forall V0x \in A\_27a.(\forall V1y \in$$
$$A\_27a.((V0x = V1y){\Leftrightarrow}(V1y = V0x)))) \tag{86}$$

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Assume the following.

$$(\forall V0t \in 2.(((True \Leftrightarrow (p\ V0t)) \Leftrightarrow (p\ V0t)) \wedge ((((p\ V0t) \Leftrightarrow True) \Leftrightarrow$$
$$(p\ V0t)) \wedge (((False \Leftrightarrow (p\ V0t)) \Leftrightarrow (\neg(p\ V0t))) \wedge (((p\ V0t) \Leftrightarrow False) \Leftrightarrow (\neg($$
$$p\ V0t))))))) \tag{87}$$

Assume the following.

$$\forall A\_27a.nonempty\ A\_27a \Rightarrow (\forall V0t1 \in A\_27a.(\forall V1t2 \in$$
$$A\_27a.(((ap\ (ap\ (ap\ (\mathsf{c\_2Ebool\_2ECOND}\ A\_27a)\ \mathsf{c\_2Ebool\_2ET})\ V0t1)$$
$$V1t2) = V0t1) \wedge ((ap\ (ap\ (ap\ (\mathsf{c\_2Ebool\_2ECOND}\ A\_27a)\ \mathsf{c\_2Ebool\_2EF})$$
$$V0t1)\ V1t2) = V1t2))))$$
$$\tag{88}$$

Assume the following.

$$(\forall V0A \in 2.(\forall V1B \in 2.(\forall V2C \in 2.(((p\ V0A) \vee ($$
$$(p\ V1B)) \vee (p\ V2C))) \Leftrightarrow (((p\ V0A) \vee (p\ V1B)) \vee (p\ V2C)))))) \tag{89}$$

Assume the following.

$$(\forall V0A \in 2.(\forall V1B \in 2.(((\neg((p\ V0A) \wedge (p\ V1B))) \Leftrightarrow ((\neg($$
$$p\ V0A)) \vee (\neg(p\ V1B)))) \wedge ((\neg((p\ V0A) \vee (p\ V1B))) \Leftrightarrow ((\neg(p\ V0A)) \wedge (\neg(p\ V1B)))))))$$
$$\tag{90}$$

Assume the following.

$$(\forall V0A \in 2.(\forall V1B \in 2.(((p\ V0A) \Rightarrow (p\ V1B)) \Leftrightarrow ((\neg(p\ V0A)) \vee$$
$$(p\ V1B))))) \tag{91}$$

Assume the following.

$$(\forall V0t \in 2.(((p\ V0t) \Rightarrow False) \Leftrightarrow ((p\ V0t) \Leftrightarrow False))) \tag{92}$$

Assume the following.

$$(\forall V0t1 \in 2.(\forall V1t2 \in 2.(\forall V2t3 \in 2.(((p\ V0t1) \Rightarrow$$
$$((p\ V1t2) \Rightarrow (p\ V2t3))) \Leftrightarrow (((p\ V0t1) \wedge (p\ V1t2)) \Rightarrow (p\ V2t3)))))) \tag{93}$$

Assume the following.

$$(\forall V0t1 \in 2.(\forall V1t2 \in 2.(((p\ V0t1) \Leftrightarrow (p\ V1t2)) \Leftrightarrow (((p$$
$$V0t1) \wedge (p\ V1t2)) \vee ((\neg(p\ V0t1)) \wedge (\neg(p\ V1t2)))))))) \tag{94}$$

Assume the following.

$$(\forall V0x \in 2.(\forall V1x\_27 \in 2.(\forall V2y \in 2.(\forall V3y\_27 \in$$
$$2.((((p\ V0x) \Leftrightarrow (p\ V1x\_27)) \wedge ((p\ V1x\_27) \Rightarrow ((p\ V2y) \Leftrightarrow (p\ V3y\_27)))) \Rightarrow \tag{95}$$
$$(((p\ V0x) \Rightarrow (p\ V2y)) \Leftrightarrow ((p\ V1x\_27) \Rightarrow (p\ V3y\_27)))))))))$$

Assume the following.

$$\forall A\_27a.nonempty\ A\_27a \Rightarrow (\forall V0P \in 2.(\forall V1Q \in 2.$$
$$(\forall V2x \in A\_27a.(\forall V3x\_27 \in A\_27a.(\forall V4y \in A\_27a.$$
$$(\forall V5y\_27 \in A\_27a.(((((p\ V0P)\Leftrightarrow(p\ V1Q))\wedge(((p\ V1Q)\Rightarrow(V2x = V3x\_27))\wedge$$
$$((\neg(p\ V1Q))\Rightarrow(V4y = V5y\_27))))\Rightarrow((ap\ (ap\ (ap\ (\mathsf{c\_2Ebool\_2ECOND}\ A\_27a)$$
$$V0P)\ V2x)\ V4y) = (ap\ (ap\ (ap\ (\mathsf{c\_2Ebool\_2ECOND}\ A\_27a)\ V1Q)\ V3x\_27)$$
$$V5y\_27)))))))))$$

$$(96)$$

Assume the following.

$$\forall A\_27a.nonempty\ A\_27a \Rightarrow (\forall V0x \in A\_27a.((ap\ (\mathsf{c\_2Ecombin\_2EI}$$
$$A\_27a)\ V0x) = V0x))$$

$$(97)$$

Assume the following.

$$\forall A\_27a.nonempty\ A\_27a \Rightarrow \forall A\_27b.nonempty\ A\_27b \Rightarrow ($$
$$\forall V0x \in (ty\_2Efcp\_2Ecart\ A\_27a\ A\_27b).(\forall V1y \in (ty\_2Efcp\_2Ecart$$
$$A\_27a\ A\_27b).((V0x = V1y)\Leftrightarrow(\forall V2i \in ty\_2Enum\_2Enum.((p\ (ap$$
$$(ap\ \mathsf{c\_2Eprim\_\_rec\_2E\_3C}\ V2i)\ (ap\ (c\_2Efcp\_2Edimindex\ A\_27b)\ ($$
$$c\_2Ebool\_2Ethe\_\_value\ A\_27b))))\Rightarrow((ap\ (ap\ (\mathsf{c\_2Efcp\_2Efcp\_\_index}$$
$$A\_27a\ A\_27b)\ V0x)\ V2i) = (ap\ (ap\ (\mathsf{c\_2Efcp\_2Efcp\_\_index}\ A\_27a\ A\_27b)$$
$$V1y)\ V2i)))))))$$

$$(98)$$

Assume the following.

$$\forall A\_27a.nonempty\ A\_27a \Rightarrow \forall A\_27b.nonempty\ A\_27b \Rightarrow ($$
$$\forall V0g \in (A\_27a^{ty\_2Enum\_2Enum}).(\forall V1i \in ty\_2Enum\_2Enum.$$
$$((p\ (ap\ (ap\ \mathsf{c\_2Eprim\_\_rec\_2E\_3C}\ V1i)\ (ap\ (c\_2Efcp\_2Edimindex\ A\_27b)$$
$$(c\_2Ebool\_2Ethe\_\_value\ A\_27b))))\Rightarrow((ap\ (ap\ (\mathsf{c\_2Efcp\_2Efcp\_\_index}$$
$$A\_27a\ A\_27b)\ (ap\ (\mathsf{c\_2Efcp\_2EFCP}\ A\_27a\ A\_27b)\ V0g))\ V1i) = (ap\ V0g$$
$$V1i)))))$$

$$(99)$$

Assume the following.

$$\forall A\_27a.nonempty\ A\_27a \Rightarrow (\forall V0l1 \in (ty\_2Elist\_2Elist$$
$$A\_27a).(\forall V1l2 \in (ty\_2Elist\_2Elist\ A\_27a).((ap\ (c\_2Elist\_2ELENGTH$$
$$A\_27a)\ (ap\ (ap\ (c\_2Elist\_2EAPPEND\ A\_27a)\ V0l1)\ V1l2)) = (ap\ (ap\ c\_2Earithmetic\_2E\_2B$$
$$(ap\ (c\_2Elist\_2ELENGTH\ A\_27a)\ V0l1))\ (ap\ (c\_2Elist\_2ELENGTH\ A\_27a)$$
$$V1l2)))))$$

$$(100)$$

Assume the following.

$$(((ap\ \mathsf{c\_2Enum\_2ESUC}\ \mathsf{c\_2Earithmetic\_2EZERO}) = (ap\ \mathsf{c\_2Earithmetic\_2EBIT1}$$
$$\mathsf{c\_2Earithmetic\_2EZERO}))\wedge((\forall V0n \in ty\_2Enum\_2Enum.((ap$$
$$\mathsf{c\_2Enum\_2ESUC}\ (ap\ \mathsf{c\_2Earithmetic\_2EBIT1}\ V0n)) = (ap\ \mathsf{c\_2Earithmetic\_2EBIT2}$$
$$V0n)))\wedge(\forall V1n \in ty\_2Enum\_2Enum.((ap\ \mathsf{c\_2Enum\_2ESUC}\ (ap\ \mathsf{c\_2Earithmetic\_2EBIT2}$$
$$V1n)) = (ap\ \mathsf{c\_2Earithmetic\_2EBIT1}\ (ap\ \mathsf{c\_2Enum\_2ESUC}\ V1n)))))))$$

$$(101)$$

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Assume the following.

$((\forall V0n \in ty\_2Enum\_2Enum.((ap\ (ap\ c\_2Earithmetic\_2E\_2B$
$\mathsf{c\_2Enum\_2E0})\ V0n) = V0n))\wedge((\forall V1n \in ty\_2Enum\_2Enum.((ap$
$(ap\ c\_2Earithmetic\_2E\_2B\ V1n)\ \mathsf{c\_2Enum\_2E0}) = V1n))\wedge((\forall V2n \in$
$ty\_2Enum\_2Enum.(\forall V3m \in ty\_2Enum\_2Enum.((ap\ (ap\ c\_2Earithmetic\_2E\_2B$
$(ap\ \mathsf{c\_2Earithmetic\_2ENUMERAL}\ V2n))\ (ap\ \mathsf{c\_2Earithmetic\_2ENUMERAL}$
$V3m)) = (ap\ \mathsf{c\_2Earithmetic\_2ENUMERAL}\ (ap\ \mathsf{c\_2Enumeral\_2EiZ}\ (ap$
$(ap\ c\_2Earithmetic\_2E\_2B\ V2n)\ V3m))))))\wedge((\forall V4n \in ty\_2Enum\_2Enum.$
$((ap\ (ap\ c\_2Earithmetic\_2E\_2A\ \mathsf{c\_2Enum\_2E0})\ V4n) = \mathsf{c\_2Enum\_2E0}))\wedge$
$((\forall V5n \in ty\_2Enum\_2Enum.((ap\ (ap\ c\_2Earithmetic\_2E\_2A$
$V5n)\ \mathsf{c\_2Enum\_2E0}) = \mathsf{c\_2Enum\_2E0}))\wedge((\forall V6n \in ty\_2Enum\_2Enum.$
$(\forall V7m \in ty\_2Enum\_2Enum.((ap\ (ap\ c\_2Earithmetic\_2E\_2A\ ($
$ap\ \mathsf{c\_2Earithmetic\_2ENUMERAL}\ V6n))\ (ap\ \mathsf{c\_2Earithmetic\_2ENUMERAL}$
$V7m)) = (ap\ \mathsf{c\_2Earithmetic\_2ENUMERAL}\ (ap\ (ap\ c\_2Earithmetic\_2E\_2A$
$V6n)\ V7m)))))\wedge((\forall V8n \in ty\_2Enum\_2Enum.((ap\ (ap\ c\_2Earithmetic\_2E\_2D$
$\mathsf{c\_2Enum\_2E0})\ V8n) = \mathsf{c\_2Enum\_2E0}))\wedge((\forall V9n \in ty\_2Enum\_2Enum.$
$((ap\ (ap\ c\_2Earithmetic\_2E\_2D\ V9n)\ \mathsf{c\_2Enum\_2E0}) = V9n))\wedge((\forall V10n \in$
$ty\_2Enum\_2Enum.(\forall V11m \in ty\_2Enum\_2Enum.((ap\ (ap\ c\_2Earithmetic\_2E\_2D$
$(ap\ \mathsf{c\_2Earithmetic\_2ENUMERAL}\ V10n))\ (ap\ \mathsf{c\_2Earithmetic\_2ENUMERAL}$
$V11m)) = (ap\ \mathsf{c\_2Earithmetic\_2ENUMERAL}\ (ap\ (ap\ c\_2Earithmetic\_2E\_2D$
$V10n)\ V11m)))))\wedge((\forall V12n \in ty\_2Enum\_2Enum.((ap\ (ap\ c\_2Earithmetic\_2EEXP$
$\mathsf{c\_2Enum\_2E0})\ (ap\ \mathsf{c\_2Earithmetic\_2ENUMERAL}\ (ap\ \mathsf{c\_2Earithmetic\_2EBIT1}$
$V12n))) = \mathsf{c\_2Enum\_2E0}))\wedge((\forall V13n \in ty\_2Enum\_2Enum.((ap$
$(ap\ c\_2Earithmetic\_2EEXP\ \mathsf{c\_2Enum\_2E0})\ (ap\ \mathsf{c\_2Earithmetic\_2ENUMERAL}$
$(ap\ \mathsf{c\_2Earithmetic\_2EBIT2}\ V13n))) = \mathsf{c\_2Enum\_2E0}))\wedge((\forall V14n \in$
$ty\_2Enum\_2Enum.((ap\ (ap\ c\_2Earithmetic\_2EEXP\ V14n)\ \mathsf{c\_2Enum\_2E0}) =$
$(ap\ \mathsf{c\_2Earithmetic\_2ENUMERAL}\ (ap\ \mathsf{c\_2Earithmetic\_2EBIT1}\ \mathsf{c\_2Earithmetic\_2EZERO}))))\wedge$
$((\forall V15n \in ty\_2Enum\_2Enum.(\forall V16m \in ty\_2Enum\_2Enum.$
$((ap\ (ap\ c\_2Earithmetic\_2EEXP\ (ap\ \mathsf{c\_2Earithmetic\_2ENUMERAL}\ V15n))$
$(ap\ \mathsf{c\_2Earithmetic\_2ENUMERAL}\ V16m)) = (ap\ \mathsf{c\_2Earithmetic\_2ENUMERAL}$
$(ap\ (ap\ c\_2Earithmetic\_2EEXP\ V15n)\ V16m)))))\wedge(((ap\ \mathsf{c\_2Enum\_2ESUC}$
$\mathsf{c\_2Enum\_2E0}) = (ap\ \mathsf{c\_2Earithmetic\_2ENUMERAL}\ (ap\ \mathsf{c\_2Earithmetic\_2EBIT1}$
$\mathsf{c\_2Earithmetic\_2EZERO})))\wedge((\forall V17n \in ty\_2Enum\_2Enum.($
$(ap\ \mathsf{c\_2Enum\_2ESUC}\ (ap\ \mathsf{c\_2Earithmetic\_2ENUMERAL}\ V17n)) = (ap\ \mathsf{c\_2Earithmetic\_2ENUMERAL}$
$(ap\ \mathsf{c\_2Enum\_2ESUC}\ V17n))))\wedge(((ap\ \mathsf{c\_2Eprim\_\_rec\_2EPRE}\ \mathsf{c\_2Enum\_2E0}) =$
$\mathsf{c\_2Enum\_2E0})\wedge((\forall V18n \in ty\_2Enum\_2Enum.((ap\ \mathsf{c\_2Eprim\_\_rec\_2EPRE}$
$(ap\ \mathsf{c\_2Earithmetic\_2ENUMERAL}\ V18n)) = (ap\ \mathsf{c\_2Earithmetic\_2ENUMERAL}$
$(ap\ \mathsf{c\_2Eprim\_\_rec\_2EPRE}\ V18n))))\wedge((\forall V19n \in ty\_2Enum\_2Enum.$
$(((ap\ \mathsf{c\_2Earithmetic\_2ENUMERAL}\ V19n) = \mathsf{c\_2Enum\_2E0})\Leftrightarrow(V19n = \mathsf{c\_2Earithmetic\_2EZERO})))\wedge$
$((\forall V20n \in ty\_2Enum\_2Enum.((\mathsf{c\_2Enum\_2E0} = (ap\ \mathsf{c\_2Earithmetic\_2ENUMERAL}$
$V20n))\Leftrightarrow(V20n = \mathsf{c\_2Earithmetic\_2EZERO})))\wedge((\forall V21n \in ty\_2Enum\_2Enum.$
$(\forall V22m \in ty\_2Enum\_2Enum.(((ap\ \mathsf{c\_2Earithmetic\_2ENUMERAL}$
$V21n) = (ap\ \mathsf{c\_2Earithmetic\_2ENUMERAL}\ V22m))\Leftrightarrow(V21n = V22m))))\wedge$
$((\forall V23n \in ty\_2Enum\_2Enum.((p\ (ap\ (ap\ \mathsf{c\_2Eprim\_\_rec\_2E\_3C}$
$V23n)\ \mathsf{c\_2Enum\_2E0}))\Leftrightarrow False))\wedge((\forall V24n \in ty\_2Enum\_2Enum.$
$((p\ (ap\ (ap\ \mathsf{c\_2Eprim\_\_rec\_2E\_3C}\ \mathsf{c\_2Enum\_2E0})\ (ap\ \mathsf{c\_2Earithmetic\_2ENUMERAL}$
$V24n)))\Leftrightarrow(p\ (ap\ (ap\ \mathsf{c\_2Eprim\_\_rec\_2E\_3C}\ \mathsf{c\_2Earithmetic\_2EZERO})$
$V24n))))\wedge((\forall V25n \in ty\_2Enum\_2Enum.(\forall V26m \in ty\_2Enum\_2Enum.$
$((p\ (ap\ (ap\ \mathsf{c\_2Eprim\_\_rec\_2E\_3C}\ (ap\ \mathsf{c\_2Earithmetic\_2ENUMERAL}$
$V25n))\ (ap\ \mathsf{c\_2Earithmetic\_2ENUMERAL}\ V26m)))\Leftrightarrow(p\ (ap\ (ap\ \mathsf{c\_2Eprim\_\_rec\_2E\_3C}$
$V25n)\ V26m)))))\wedge((\forall V27n \in ty\_2Enum\_2Enum.((p\ (ap\ (ap\ \mathsf{c\_2Earithmetic\_2E\_3E}$
$\mathsf{c\_2Enum\_2E0})\ V27n))\Leftrightarrow False))\wedge((\forall V28n \in ty\_2Enum\_2Enum.$
$((p\ (ap\ (ap\ \mathsf{c\_2Earithmetic\_2E\_3E}\ (ap\ \mathsf{c\_2Earithmetic\_2ENUMERAL}$
$V28n))\ \mathsf{c\_2Enum\_2E0}))\Leftrightarrow(p\ (ap\ (ap\ \mathsf{c\_2Eprim\_\_rec\_2E\_3C}\ \mathsf{c\_2Earithmetic\_2EZERO})$
$V28n))))\wedge((\forall V29n \in ty\_2Enum\_2Enum.(\forall V30m \in ty\_2Enum\_2Enum.$
$((p\ (ap\ (ap\ \mathsf{c\_2Earithmetic\_2E\_3E}\ (ap\ \mathsf{c\_2Earithmetic\_2ENUMERAL}$
$V29n))\ (ap\ \mathsf{c\_2Earithmetic\_2ENUMERAL}\ V30m)))\Leftrightarrow(p\ (ap\ (ap\ \mathsf{c\_2Eprim\_\_rec\_2E\_3C}$
$V30m)\ V29n)))))\wedge((\forall V31n \in ty\_2Enum\_2Enum.((p\ (ap\ (ap\ \mathsf{c\_2Earithmetic\_2E\_3C\_3D}$
$\mathsf{c\_2Enum\_2E0})\ V31n))\Leftrightarrow True))\wedge((\forall V32n \in ty\_2Enum\_2Enum.$

Assume the following.

$$(\forall V0n \in ty\_2Enum\_2Enum.(\forall V1m \in ty\_2Enum\_2Enum.($$

$((ap \; \mathsf{c\_2Enumeral\_2EiZ} \; (ap \; (ap \; c\_2Earithmetic\_2E\_2B \; \mathsf{c\_2Earithmetic\_2EZERO})$
$V0n)) = V0n) \wedge (((ap \; \mathsf{c\_2Enumeral\_2EiZ} \; (ap \; (ap \; c\_2Earithmetic\_2E\_2B$
$V0n) \; \mathsf{c\_2Earithmetic\_2EZERO})) = V0n) \wedge (((ap \; \mathsf{c\_2Enumeral\_2EiZ} \; ($
$ap \; (ap \; c\_2Earithmetic\_2E\_2B \; (ap \; \mathsf{c\_2Earithmetic\_2EBIT1} \; V0n)) \; ($
$ap \; \mathsf{c\_2Earithmetic\_2EBIT1} \; V1m))) = (ap \; \mathsf{c\_2Earithmetic\_2EBIT2} \; ($
$ap \; \mathsf{c\_2Enumeral\_2EiZ} \; (ap \; (ap \; c\_2Earithmetic\_2E\_2B \; V0n) \; V1m)))) \wedge$
$(((ap \; \mathsf{c\_2Enumeral\_2EiZ} \; (ap \; (ap \; c\_2Earithmetic\_2E\_2B \; (ap \; \mathsf{c\_2Earithmetic\_2EBIT1}$
$V0n)) \; (ap \; \mathsf{c\_2Earithmetic\_2EBIT2} \; V1m))) = (ap \; \mathsf{c\_2Earithmetic\_2EBIT1}$
$(ap \; \mathsf{c\_2Enum\_2ESUC} \; (ap \; (ap \; c\_2Earithmetic\_2E\_2B \; V0n) \; V1m)))) \wedge ($
$((ap \; \mathsf{c\_2Enumeral\_2EiZ} \; (ap \; (ap \; c\_2Earithmetic\_2E\_2B \; (ap \; \mathsf{c\_2Earithmetic\_2EBIT2}$
$V0n)) \; (ap \; \mathsf{c\_2Earithmetic\_2EBIT1} \; V1m))) = (ap \; \mathsf{c\_2Earithmetic\_2EBIT1}$
$(ap \; \mathsf{c\_2Enum\_2ESUC} \; (ap \; (ap \; c\_2Earithmetic\_2E\_2B \; V0n) \; V1m)))) \wedge ($
$((ap \; \mathsf{c\_2Enumeral\_2EiZ} \; (ap \; (ap \; c\_2Earithmetic\_2E\_2B \; (ap \; \mathsf{c\_2Earithmetic\_2EBIT2}$
$V0n)) \; (ap \; \mathsf{c\_2Earithmetic\_2EBIT2} \; V1m))) = (ap \; \mathsf{c\_2Earithmetic\_2EBIT2}$
$(ap \; \mathsf{c\_2Enum\_2ESUC} \; (ap \; (ap \; c\_2Earithmetic\_2E\_2B \; V0n) \; V1m)))) \wedge ($
$((ap \; \mathsf{c\_2Enum\_2ESUC} \; (ap \; (ap \; c\_2Earithmetic\_2E\_2B \; \mathsf{c\_2Earithmetic\_2EZERO})$
$V0n)) = (ap \; \mathsf{c\_2Enum\_2ESUC} \; V0n)) \wedge (((ap \; \mathsf{c\_2Enum\_2ESUC} \; (ap \; (ap \; c\_2Earithmetic\_2E\_2B$
$V0n) \; \mathsf{c\_2Earithmetic\_2EZERO})) = (ap \; \mathsf{c\_2Enum\_2ESUC} \; V0n)) \wedge (((ap$
$\mathsf{c\_2Enum\_2ESUC} \; (ap \; (ap \; c\_2Earithmetic\_2E\_2B \; (ap \; \mathsf{c\_2Earithmetic\_2EBIT1}$
$V0n)) \; (ap \; \mathsf{c\_2Earithmetic\_2EBIT1} \; V1m))) = (ap \; \mathsf{c\_2Earithmetic\_2EBIT1}$
$(ap \; \mathsf{c\_2Enum\_2ESUC} \; (ap \; (ap \; c\_2Earithmetic\_2E\_2B \; V0n) \; V1m)))) \wedge ($
$((ap \; \mathsf{c\_2Enum\_2ESUC} \; (ap \; (ap \; c\_2Earithmetic\_2E\_2B \; (ap \; \mathsf{c\_2Earithmetic\_2EBIT1}$
$V0n)) \; (ap \; \mathsf{c\_2Earithmetic\_2EBIT2} \; V1m))) = (ap \; \mathsf{c\_2Earithmetic\_2EBIT2}$
$(ap \; \mathsf{c\_2Enum\_2ESUC} \; (ap \; (ap \; c\_2Earithmetic\_2E\_2B \; V0n) \; V1m)))) \wedge ($
$((ap \; \mathsf{c\_2Enum\_2ESUC} \; (ap \; (ap \; c\_2Earithmetic\_2E\_2B \; (ap \; \mathsf{c\_2Earithmetic\_2EBIT2}$
$V0n)) \; (ap \; \mathsf{c\_2Earithmetic\_2EBIT1} \; V1m))) = (ap \; \mathsf{c\_2Earithmetic\_2EBIT2}$
$(ap \; \mathsf{c\_2Enum\_2ESUC} \; (ap \; (ap \; c\_2Earithmetic\_2E\_2B \; V0n) \; V1m)))) \wedge ($
$((ap \; \mathsf{c\_2Enum\_2ESUC} \; (ap \; (ap \; c\_2Earithmetic\_2E\_2B \; (ap \; \mathsf{c\_2Earithmetic\_2EBIT2}$
$V0n)) \; (ap \; \mathsf{c\_2Earithmetic\_2EBIT2} \; V1m))) = (ap \; \mathsf{c\_2Earithmetic\_2EBIT1}$
$(ap \; \mathsf{c\_2Enumeral\_2EiiSUC} \; (ap \; (ap \; c\_2Earithmetic\_2E\_2B \; V0n) \; V1m)))) \wedge$
$(((ap \; \mathsf{c\_2Enumeral\_2EiiSUC} \; (ap \; (ap \; c\_2Earithmetic\_2E\_2B \; \mathsf{c\_2Earithmetic\_2EZERO})$
$V0n)) = (ap \; \mathsf{c\_2Enumeral\_2EiiSUC} \; V0n)) \wedge (((ap \; \mathsf{c\_2Enumeral\_2EiiSUC}$
$(ap \; (ap \; c\_2Earithmetic\_2E\_2B \; V0n) \; \mathsf{c\_2Earithmetic\_2EZERO})) = ($
$ap \; \mathsf{c\_2Enumeral\_2EiiSUC} \; V0n)) \wedge (((ap \; \mathsf{c\_2Enumeral\_2EiiSUC} \; (ap \; ($
$ap \; c\_2Earithmetic\_2E\_2B \; (ap \; \mathsf{c\_2Earithmetic\_2EBIT1} \; V0n)) \; (ap \; \mathsf{c\_2Earithmetic\_2EBIT1}$
$V1m))) = (ap \; \mathsf{c\_2Earithmetic\_2EBIT2} \; (ap \; \mathsf{c\_2Enum\_2ESUC} \; (ap \; (ap \; c\_2Earithmetic\_2E\_2B$
$V0n) \; V1m)))) \wedge (((ap \; \mathsf{c\_2Enumeral\_2EiiSUC} \; (ap \; (ap \; c\_2Earithmetic\_2E\_2B$
$(ap \; \mathsf{c\_2Earithmetic\_2EBIT1} \; V0n)) \; (ap \; \mathsf{c\_2Earithmetic\_2EBIT2} \; V1m))) =$
$(ap \; \mathsf{c\_2Earithmetic\_2EBIT1} \; (ap \; \mathsf{c\_2Enumeral\_2EiiSUC} \; (ap \; (ap \; c\_2Earithmetic\_2E\_2B$
$V0n) \; V1m)))) \wedge (((ap \; \mathsf{c\_2Enumeral\_2EiiSUC} \; (ap \; (ap \; c\_2Earithmetic\_2E\_2B$
$(ap \; \mathsf{c\_2Earithmetic\_2EBIT2} \; V0n)) \; (ap \; \mathsf{c\_2Earithmetic\_2EBIT1} \; V1m))) =$
$(ap \; \mathsf{c\_2Earithmetic\_2EBIT1} \; (ap \; \mathsf{c\_2Enumeral\_2EiiSUC} \; (ap \; (ap \; c\_2Earithmetic\_2E\_2B$
$V0n) \; V1m)))) \wedge ((ap \; \mathsf{c\_2Enumeral\_2EiiSUC} \; (ap \; (ap \; c\_2Earithmetic\_2E\_2B$
$(ap \; \mathsf{c\_2Earithmetic\_2EBIT2} \; V0n)) \; (ap \; \mathsf{c\_2Earithmetic\_2EBIT2} \; V1m))) =$
$(ap \; \mathsf{c\_2Earithmetic\_2EBIT2} \; (ap \; \mathsf{c\_2Enumeral\_2EiiSUC} \; (ap \; (ap \; c\_2Earithmetic\_2E\_2B$
$V0n) \; V1m))))))))))))))))))))))))$

$$(103)$$

Assume the following.

$$(\forall V0n \in ty\_2Enum\_2Enum.(\forall V1m \in ty\_2Enum\_2Enum.($$
$$((\textsf{c\_2Earithmetic\_2EZERO} = (ap\ \textsf{c\_2Earithmetic\_2EBIT1}\ V0n))\Leftrightarrow False)\wedge$$
$$((((ap\ \textsf{c\_2Earithmetic\_2EBIT1}\ V0n) = \textsf{c\_2Earithmetic\_2EZERO})\Leftrightarrow$$
$$False)\wedge(((\textsf{c\_2Earithmetic\_2EZERO} = (ap\ \textsf{c\_2Earithmetic\_2EBIT2}$$
$$V0n))\Leftrightarrow False)\wedge((((ap\ \textsf{c\_2Earithmetic\_2EBIT2}\ V0n) = \textsf{c\_2Earithmetic\_2EZERO})\Leftrightarrow$$
$$False)\wedge((((ap\ \textsf{c\_2Earithmetic\_2EBIT1}\ V0n) = (ap\ \textsf{c\_2Earithmetic\_2EBIT2}$$
$$V1m))\Leftrightarrow False)\wedge((((ap\ \textsf{c\_2Earithmetic\_2EBIT2}\ V0n) = (ap\ \textsf{c\_2Earithmetic\_2EBIT1}$$
$$V1m))\Leftrightarrow False)\wedge((((ap\ \textsf{c\_2Earithmetic\_2EBIT1}\ V0n) = (ap\ \textsf{c\_2Earithmetic\_2EBIT1}$$
$$V1m))\Leftrightarrow(V0n = V1m))\wedge(((ap\ \textsf{c\_2Earithmetic\_2EBIT2}\ V0n) = (ap\ \textsf{c\_2Earithmetic\_2EBIT2}$$
$$V1m))\Leftrightarrow(V0n = V1m))))))))))))$$

(104)

Assume the following.

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

(105)

Assume the following.

$$(\forall V0n \in ty\_2Enum\_2Enum.(\forall V1m \in ty\_2Enum\_2Enum.($$
$$((p\ (ap\ (ap\ \textsf{c\_2Earithmetic\_2E\_3C\_3D}\ \textsf{c\_2Earithmetic\_2EZERO})\ V0n))\Leftrightarrow$$
$$True)\wedge(((p\ (ap\ (ap\ \textsf{c\_2Earithmetic\_2E\_3C\_3D}\ (ap\ \textsf{c\_2Earithmetic\_2EBIT1}$$
$$V0n))\ \textsf{c\_2Earithmetic\_2EZERO}))\Leftrightarrow False)\wedge(((p\ (ap\ (ap\ \textsf{c\_2Earithmetic\_2E\_3C\_3D}$$
$$(ap\ \textsf{c\_2Earithmetic\_2EBIT2}\ V0n))\ \textsf{c\_2Earithmetic\_2EZERO}))\Leftrightarrow False)\wedge$$
$$(((p\ (ap\ (ap\ \textsf{c\_2Earithmetic\_2E\_3C\_3D}\ (ap\ \textsf{c\_2Earithmetic\_2EBIT1}$$
$$V0n))\ (ap\ \textsf{c\_2Earithmetic\_2EBIT1}\ V1m)))\Leftrightarrow(p\ (ap\ (ap\ \textsf{c\_2Earithmetic\_2E\_3C\_3D}$$
$$V0n)\ V1m)))\wedge(((p\ (ap\ (ap\ \textsf{c\_2Earithmetic\_2E\_3C\_3D}\ (ap\ \textsf{c\_2Earithmetic\_2EBIT1}$$
$$V0n))\ (ap\ \textsf{c\_2Earithmetic\_2EBIT2}\ V1m)))\Leftrightarrow(p\ (ap\ (ap\ \textsf{c\_2Earithmetic\_2E\_3C\_3D}$$
$$V0n)\ V1m)))\wedge(((p\ (ap\ (ap\ \textsf{c\_2Earithmetic\_2E\_3C\_3D}\ (ap\ \textsf{c\_2Earithmetic\_2EBIT2}$$
$$V0n))\ (ap\ \textsf{c\_2Earithmetic\_2EBIT1}\ V1m)))\Leftrightarrow(\neg(p\ (ap\ (ap\ \textsf{c\_2Earithmetic\_2E\_3C\_3D}$$
$$V1m)\ V0n))))\wedge((p\ (ap\ (ap\ \textsf{c\_2Earithmetic\_2E\_3C\_3D}\ (ap\ \textsf{c\_2Earithmetic\_2EBIT2}$$
$$V0n))\ (ap\ \textsf{c\_2Earithmetic\_2EBIT2}\ V1m)))\Leftrightarrow(p\ (ap\ (ap\ \textsf{c\_2Earithmetic\_2E\_3C\_3D}$$
$$V0n)\ V1m)))))))))))$$

(106)

Assume the following.

$$(\forall V0n \in ty\_2Enum\_2Enum.(\neg(p\ (ap\ (ap\ \mathsf{c\_2Eprim\_\_rec\_2E\_3C}$$
$$V0n)\ \mathsf{c\_2Enum\_2E0})))) \tag{107}$$

Assume the following.

$$\forall A\_27a.nonempty\ A\_27a \Rightarrow (\forall V0n \in ty\_2Enum\_2Enum.($$
$$\forall V1l1 \in (ty\_2Elist\_2Elist\ A\_27a).(\forall V2l2 \in (ty\_2Elist\_2Elist$$
$$A\_27a).((p\ (ap\ (ap\ \mathsf{c\_2Eprim\_\_rec\_2E\_3C}\ V0n)\ (ap\ (c\_2Elist\_2ELENGTH$$
$$A\_27a)\ V1l1))) \Rightarrow ((ap\ (ap\ (c\_2Elist\_2EEL\ A\_27a)\ V0n)\ (ap\ (ap\ (c\_2Elist\_2EAPPEND$$
$$A\_27a)\ V1l1)\ V2l2)) = (ap\ (ap\ (c\_2Elist\_2EEL\ A\_27a)\ V0n)\ V1l1)))))) \tag{108}$$

Assume the following.

$$\forall A\_27a.nonempty\ A\_27a \Rightarrow (\forall V0l1 \in (ty\_2Elist\_2Elist$$
$$A\_27a).(\forall V1n \in ty\_2Enum\_2Enum.((p\ (ap\ (ap\ \mathsf{c\_2Earithmetic\_2E\_3C\_3D}$$
$$(ap\ (c\_2Elist\_2ELENGTH\ A\_27a)\ V0l1))\ V1n)) \Rightarrow (\forall V2l2 \in (ty\_2Elist\_2Elist$$
$$A\_27a).((ap\ (ap\ (c\_2Elist\_2EEL\ A\_27a)\ V1n)\ (ap\ (ap\ (c\_2Elist\_2EAPPEND$$
$$A\_27a)\ V0l1)\ V2l2)) = (ap\ (ap\ (c\_2Elist\_2EEL\ A\_27a)\ (ap\ (ap\ \mathsf{c\_2Earithmetic\_2E\_2D}$$
$$V1n)\ (ap\ (c\_2Elist\_2ELENGTH\ A\_27a)\ V0l1)))\ V2l2)))))) \tag{109}$$

Assume the following.

$$(\forall V0t \in 2.((\neg(\neg(p\ V0t))) \Leftrightarrow (p\ V0t))) \tag{110}$$

Assume the following.

$$(\forall V0A \in 2.((p\ V0A) \Rightarrow ((\neg(p\ V0A)) \Rightarrow False))) \tag{111}$$

Assume the following.

$$(\forall V0A \in 2.(\forall V1B \in 2.(((\neg((p\ V0A) \vee (p\ V1B))) \Rightarrow False) \Leftrightarrow$$
$$(((p\ V0A) \Rightarrow False) \Rightarrow ((\neg(p\ V1B)) \Rightarrow False))))) \tag{112}$$

Assume the following.

$$(\forall V0A \in 2.(\forall V1B \in 2.(((\neg((\neg(p\ V0A)) \vee (p\ V1B))) \Rightarrow False) \Leftrightarrow$$
$$((p\ V0A) \Rightarrow ((\neg(p\ V1B)) \Rightarrow False))))) \tag{113}$$

Assume the following.

$$(\forall V0A \in 2.(((\neg(p\ V0A)) \Rightarrow False) \Rightarrow (((p\ V0A) \Rightarrow False) \Rightarrow False))) \tag{114}$$

Assume the following.

$$(\forall V0p \in 2.(\forall V1q \in 2.(\forall V2r \in 2.(((p\ V0p) \Leftrightarrow ($$
$$(p\ V1q) \Leftrightarrow (p\ V2r))) \Leftrightarrow (((p\ V0p) \vee ((p\ V1q) \vee (p\ V2r))) \wedge (((p\ V0p) \vee ((\neg($$
$$p\ V2r)) \vee (\neg(p\ V1q)))) \wedge (((p\ V1q) \vee ((\neg(p\ V2r)) \vee (\neg(p\ V0p)))) \wedge ((p\ V2r) \vee$$
$$((\neg(p\ V1q)) \vee (\neg(p\ V0p))))))))))))) \tag{115}$$

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Assume the following.

$$(\forall V0p \in 2.(\forall V1q \in 2.(\forall V2r \in 2.(((p\ V0p)\Leftrightarrow($$
$$(p\ V1q)\wedge(p\ V2r)))\Leftrightarrow(((p\ V0p)\vee((\neg(p\ V1q))\vee(\neg(p\ V2r))))\wedge(((p\ V1q)\vee$$
$$(\neg(p\ V0p)))\wedge((p\ V2r)\vee(\neg(p\ V0p))))))))))$$

$$(116)$$

Assume the following.

$$(\forall V0p \in 2.(\forall V1q \in 2.(\forall V2r \in 2.(((p\ V0p)\Leftrightarrow($$
$$(p\ V1q)\vee(p\ V2r)))\Leftrightarrow(((p\ V0p)\vee(\neg(p\ V1q)))\wedge(((p\ V0p)\vee(\neg(p\ V2r)))\wedge$$
$$((p\ V1q)\vee((p\ V2r)\vee(\neg(p\ V0p))))))))))$$

$$(117)$$

Assume the following.

$$(\forall V0p \in 2.(\forall V1q \in 2.(\forall V2r \in 2.(((p\ V0p)\Leftrightarrow($$
$$(p\ V1q)\Rightarrow(p\ V2r)))\Leftrightarrow(((p\ V0p)\vee(p\ V1q))\wedge(((p\ V0p)\vee(\neg(p\ V2r)))\wedge(($$
$$\neg(p\ V1q))\vee((p\ V2r)\vee(\neg(p\ V0p))))))))))$$

$$(118)$$

Assume the following.

$$(\forall V0p \in 2.(\forall V1q \in 2.(((p\ V0p)\Leftrightarrow(\neg(p\ V1q)))\Leftrightarrow(((p\ V0p)\vee$$
$$(p\ V1q))\wedge((\neg(p\ V1q))\vee(\neg(p\ V0p))))))))$$

$$(119)$$

Assume the following.

$$(\forall V0p \in 2.(\forall V1q \in 2.((\neg((p\ V0p)\Rightarrow(p\ V1q)))\Rightarrow(p\ V0p))))$$

$$(120)$$

Assume the following.

$$(\forall V0p \in 2.(\forall V1q \in 2.((\neg((p\ V0p)\Rightarrow(p\ V1q)))\Rightarrow(\neg(p\ V1q)))))$$

$$(121)$$

Assume the following.

$$(\forall V0p \in 2.(\forall V1q \in 2.((\neg((p\ V0p)\vee(p\ V1q)))\Rightarrow(\neg(p\ V0p)))))$$

$$(122)$$

Assume the following.

$$(\forall V0p \in 2.(\forall V1q \in 2.((\neg((p\ V0p)\vee(p\ V1q)))\Rightarrow(\neg(p\ V1q)))))$$

$$(123)$$

Assume the following.

$$(\forall V0p \in 2.((\neg(\neg(p\ V0p)))\Rightarrow(p\ V0p)))$$

$$(124)$$

Assume the following.

$$\forall A\_27a.nonempty\ A\_27a\Rightarrow(p\ (ap\ (ap\ \mathsf{c\_2Eprim\_rec\_2E\_3C\ c\_2Enum\_2E0})$$
$$(ap\ (c\_2Efcp\_2Edimindex\ A\_27a)\ (c\_2Ebool\_2Ethe\_value\ A\_27a)))))$$

$$(125)$$

Assume the following.

$$\forall A\_27a.nonempty\ A\_27a \Rightarrow (\forall V0w \in (ty\_2Efcp\_2Ecart$$
$$2\ A\_27a).(\forall V1b \in ty\_2Enum\_2Enum.((p\ (ap\ (ap\ \mathsf{c\_2Eprim\_rec\_2E\_3C}$$
$$V1b)\ (ap\ (c\_2Efcp\_2Edimindex\ A\_27a)\ (c\_2Ebool\_2Ethe\_value\ A\_27a)))) \Rightarrow$$
$$((p\ (ap\ (ap\ (\mathsf{c\_2Efcp\_2Efcp\_index}\ 2\ A\_27a)\ V0w)\ V1b)) \Leftrightarrow (p\ (ap\ (ap$$
$$(\mathsf{c\_2Ewords\_2Eword\_bit}\ A\_27a)\ V1b)\ V0w))))))$$

$$(126)$$

Assume the following.

$$\forall A\_27a.nonempty\ A\_27a \Rightarrow (\forall V0w \in (ty\_2Efcp\_2Ecart$$
$$2\ A\_27a).(\forall V1n \in ty\_2Enum\_2Enum.((ap\ (ap\ (\mathsf{c\_2Ewords\_2Eword\_ror}$$
$$A\_27a)\ V0w)\ V1n) = (ap\ (ap\ (\mathsf{c\_2Ebool\_2ELET}\ ty\_2Enum\_2Enum\ (ty\_2Efcp\_2Ecart$$
$$2\ A\_27a))\ (\lambda V2x \in ty\_2Enum\_2Enum.(ap\ (ap\ (\mathsf{c\_2Ewords\_2Eword\_or}$$
$$A\_27a)\ (ap\ (ap\ (ap\ (\mathsf{c\_2Ewords\_2Eword\_bits}\ A\_27a)\ (ap\ (ap\ c\_2Earithmetic\_2E\_2D$$
$$(ap\ (c\_2Efcp\_2Edimindex\ A\_27a)\ (c\_2Ebool\_2Ethe\_value\ A\_27a)))$$
$$(ap\ \mathsf{c\_2Earithmetic\_2ENUMERAL}\ (ap\ \mathsf{c\_2Earithmetic\_2EBIT1}\ \mathsf{c\_2Earithmetic\_2EZERO}))))$$
$$V2x)\ V0w))\ (ap\ (ap\ (\mathsf{c\_2Ewords\_2Eword\_lsl}\ A\_27a)\ (ap\ (ap\ (ap\ (\mathsf{c\_2Ewords\_2Eword\_bits}$$
$$A\_27a)\ (ap\ (ap\ c\_2Earithmetic\_2E\_2D\ V2x)\ (ap\ \mathsf{c\_2Earithmetic\_2ENUMERAL}$$
$$(ap\ \mathsf{c\_2Earithmetic\_2EBIT1}\ \mathsf{c\_2Earithmetic\_2EZERO}))))\ \mathsf{c\_2Enum\_2E0})$$
$$V0w))\ (ap\ (ap\ c\_2Earithmetic\_2E\_2D\ (ap\ (c\_2Efcp\_2Edimindex\ A\_27a)$$
$$(c\_2Ebool\_2Ethe\_value\ A\_27a)))\ V2x)))))\ (ap\ (ap\ c\_2Earithmetic\_2EMOD$$
$$V1n)\ (ap\ (c\_2Efcp\_2Edimindex\ A\_27a)\ (c\_2Ebool\_2Ethe\_value\ A\_27a)))))))))$$

$$(127)$$

Theorem 1

$$\forall A\_27a.nonempty\ A\_27a \Rightarrow (\forall V0n \in ty\_2Enum\_2Enum.($$
$$\forall V1v \in (ty\_2Elist\_2Elist\ 2).((ap\ (ap\ (\mathsf{c\_2Ewords\_2Eword\_ror}$$
$$A\_27a)\ (ap\ (\mathsf{c\_2Ebitstring\_2Ev2w}\ A\_27a)\ V1v))\ V0n) = (ap\ (\mathsf{c\_2Ebitstring\_2Ev2w}$$
$$A\_27a)\ (ap\ (ap\ \mathsf{c\_2Ebitstring\_2Erotate}\ (ap\ (ap\ \mathsf{c\_2Ebitstring\_2Efixwidth}$$
$$(ap\ (c\_2Efcp\_2Edimindex\ A\_27a)\ (c\_2Ebool\_2Ethe\_value\ A\_27a)))$$
$$V1v))\ V0n)))))$$