

thm\_2Ebitstring\_2Eword\_\_asr\_\_v2w  
(TMWrrqCnjgUkVjccHbg5xDF76p5s7oHCreq)

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

$$\forall A0.nonempty\ A0 \Rightarrow nonempty\ (ty\_2Elist\_2Elist\ A0) \quad (1)$$

Let  $c\_2Elist\_2EHD : \iota \Rightarrow \iota$  be given. Assume the following.

$$\forall A\_27a.nonempty\ A\_27a \Rightarrow c\_2Elist\_2EHD\ A\_27a \in (A\_27a^{(ty\_2Elist\_2Elist\ A\_27a)}) \quad (2)$$

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

$$nonempty\ ty\_2Enum\_2Enum \quad (3)$$

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

$$\forall A\_27a.nonempty\ A\_27a \Rightarrow c\_2Elist\_2ELENGTH\ A\_27a \in (ty\_2Enum\_2Enum^{(ty\_2Elist\_2Elist\ A\_27a)}) \quad (4)$$

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

$$c\_2Earithmetic\_2E\_2D \in ((ty\_2Enum\_2Enum^{ty\_2Enum\_2Enum})^{ty\_2Enum\_2Enum}) \quad (5)$$

**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  $c\_2Ecombin\_2EK$  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.

$$\forall A\_27a.nonempty\ A\_27a \Rightarrow c\_2Elist\_2EGENLIST\ A\_27a \in (((ty\_2Elist\_2Elist\ A\_27a)^{ty\_2Enum\_2Enum})^{(A\_27a^{ty\_2Enum\_2Enum})}) \quad (6)$$

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

$$\forall A\_27a.nonempty\ A\_27a \Rightarrow c\_2Elist\_2EAPPEND\ A\_27a \in (((ty\_2Elist\_2Elist\ A\_27a)^{(ty\_2Elist\_2Elist\ A\_27a)})^{(ty\_2Elist\_2Elist\ A\_27a)}) \quad (7)$$

**Definition 3** 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 4** We define  $c\_2Ebool\_2E\_21$  to be  $\lambda A\_27a : \iota. (\lambda V0P \in (2^{A\_27a}). (ap (ap (c\_2Emin\_2E\_3D (2^{A\_27a})))$

**Definition 5** We define  $c\_2Elist\_2EPAD\_LEFT$  to be  $\lambda A\_27a : \iota. \lambda V0c \in A\_27a. \lambda V1n \in ty\_2Enum\_2Enum$

**Definition 6** We define  $c\_2Ebitstring\_2Esign\_extend$  to be  $\lambda A\_27a : \iota. \lambda V0n \in ty\_2Enum\_2Enum. \lambda V1v \in ($

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

$$\forall A\_27a. nonempty A\_27a \Rightarrow c\_2Elist\_2ENIL A\_27a \in (ty\_2Elist\_2Elist A\_27a) \quad (8)$$

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

$$\forall A\_27a. nonempty A\_27a \Rightarrow c\_2Elist\_2ECONS A\_27a \in (((ty\_2Elist\_2Elist A\_27a)^{(ty\_2Elist\_2Elist A\_27a)})^{A\_27a}) \quad (9)$$

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

$$\forall A\_27a. nonempty A\_27a \Rightarrow c\_2Elist\_2ETAKE A\_27a \in (((ty\_2Elist\_2Elist A\_27a)^{(ty\_2Elist\_2Elist A\_27a)})^{ty\_2Enum\_2Enum}) \quad (10)$$

**Definition 7** We define  $c\_2Ebitstring\_2Eshiftr$  to be  $\lambda V0v \in (ty\_2Elist\_2Elist 2). \lambda V1m \in ty\_2Enum\_2Enum$

Let  $c\_2Enum\_2EREP\_num : \iota$  be given. Assume the following.

$$c\_2Enum\_2EREP\_num \in (\omega^{ty\_2Enum\_2Enum}) \quad (11)$$

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

$$c\_2Enum\_2ESUC\_REP \in (\omega^{\omega}) \quad (12)$$

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

$$c\_2Enum\_2EABS\_num \in (ty\_2Enum\_2Enum^{\omega}) \quad (13)$$

**Definition 8** We define  $c\_2Enum\_2ESUC$  to be  $\lambda V0m \in ty\_2Enum\_2Enum. (ap c\_2Enum\_2EABS\_num$

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

$$\forall A\_27a. nonempty A\_27a \Rightarrow c\_2Elist\_2EDROP A\_27a \in (((ty\_2Elist\_2Elist A\_27a)^{(ty\_2Elist\_2Elist A\_27a)})^{ty\_2Enum\_2Enum}) \quad (14)$$

**Definition 9** We define  $c\_2Ebool\_2EF$  to be  $(ap (c\_2Ebool\_2E\_21 2) (\lambda V0t \in 2.V0t))$ .

**Definition 10** We define  $c\_2Ebitstring\_2Ezero\_extend$  to be  $\lambda V0n \in ty\_2Enum\_2Enum. \lambda V1v \in (ty\_2Elist$

**Definition 11** 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  $\iota$ .

**Definition 12** We define `c_2Ebool_2E_7E` to be  $(\lambda V0t \in 2.(ap (ap c_2Emin_2E_3D_3D_3E V0t) c_2Ebool_2E_7E$

**Definition 13** 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 14** We define `c_2Emin_2E_40` to be  $\lambda A.\lambda P \in 2^A.\text{if } (\exists x \in A.p (ap P x)) \text{ then } (the (\lambda x.x \in A \wedge p x) \text{ of type } \iota \Rightarrow \iota.$

**Definition 15** 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 16** We define `c_2Eprim__rec_2E_3C` to be  $\lambda V0m \in ty_2Enum_2Enum.\lambda V1n \in ty_2Enum_2Enum$

**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_2ELET` to be  $\lambda A_27a : \iota.\lambda A_27b : \iota.(\lambda V0f \in (A_27b^{A_27a}).(\lambda V1x \in A_27b$

**Definition 19** We define `c_2Ebitstring_2Efixwidth` to be  $\lambda V0n \in ty_2Enum_2Enum.\lambda V1v \in (ty_2Elist_2E$

**Definition 20** We define `c_2Ebitstring_2Efield` to be  $\lambda V0h \in ty_2Enum_2Enum.\lambda V1l \in ty_2Enum_2Enum$

**Definition 21** We define `c_2Ebitstring_2Etestbit` to be  $\lambda V0b \in ty_2Enum_2Enum.\lambda V1v \in (ty_2Elist_2E$

Let `ty_2EfcP_2Efinite__image` :  $\iota \Rightarrow \iota$  be given. Assume the following.

$$\forall A0.nonempty A0 \Rightarrow nonempty (ty_2EfcP_2Efinite__image A0) \quad (15)$$

Let `ty_2Ebool_2Eitself` :  $\iota \Rightarrow \iota$  be given. Assume the following.

$$\forall A0.nonempty A0 \Rightarrow nonempty (ty_2Ebool_2Eitself A0) \quad (16)$$

Let `c_2Ebool_2Ethe__value` :  $\iota \Rightarrow \iota$  be given. Assume the following.

$$\forall A_27a.nonempty A_27a \Rightarrow c_2Ebool_2Ethe__value A_27a \in (ty_2Ebool_2Eitself A_27a) \quad (17)$$

Let `c_2EfcP_2Edimindex` :  $\iota \Rightarrow \iota$  be given. Assume the following.

$$\forall A_27a.nonempty A_27a \Rightarrow c_2EfcP_2Edimindex A_27a \in (ty_2Enum_2Enum^{(ty_2Ebool_2Eitself A_27a)}) \quad (18)$$

**Definition 22** 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 23** We define `c_2EfcP_2Efinite__index` to be  $\lambda A_27a : \iota.(ap (c_2Emin_2E_40 (A_27a^{ty_2Enum_2Enum$

Let `ty_2EfcP_2Ecart` :  $\iota \Rightarrow \iota \Rightarrow \iota$  be given. Assume the following.

$$\forall A0.nonempty A0 \Rightarrow \forall A1.nonempty A1 \Rightarrow nonempty (ty_2EfcP_2Ecart A0 A1) \quad (19)$$

Let `c_2EfcP_2Edest__cart` :  $\iota \Rightarrow \iota \Rightarrow \iota$  be given. Assume the following.

$$\forall A_27a.nonempty A_27a \Rightarrow \forall A_27b.nonempty A_27b \Rightarrow c_2EfcP_2Edest__cart A_27a A_27b \in ((A_27a^{(ty_2EfcP_2Efinite__image A_27b)})^{(ty_2EfcP_2Ecart A_27a A_27b)}) \quad (20)$$

**Definition 24** We define  $c\_2Efc\_2Efc\_index$  to be  $\lambda A\_27a : \iota.\lambda A\_27b : \iota.\lambda V0x \in (ty\_2Efc\_2Ecart\ A\_27a)$

**Definition 25** We define  $c\_2Efc\_2EFCP$  to be  $\lambda A\_27a : \iota.\lambda A\_27b : \iota.(\lambda V0g \in (A\_27a^{ty\_2Enum\_2Enum}).(ap\ g\ (c\_2Efc\_2Efc\_index\ A\_27a\ A\_27b)))$

**Definition 26** We define  $c\_2Ebitstring\_2Ev2w$  to be  $\lambda A\_27a : \iota.\lambda V0v \in (ty\_2Elist\_2Elist\ 2).(ap\ (c\_2Efc\_2Efc\_index\ A\_27a\ v))$

**Definition 27** We define  $c\_2Ecombin\_2ES$  to be  $\lambda A\_27a : \iota.\lambda A\_27b : \iota.\lambda A\_27c : \iota.(\lambda V0f \in ((A\_27c^{A\_27b})^{A\_27a}))$

**Definition 28** We define  $c\_2Ecombin\_2EI$  to be  $\lambda A\_27a : \iota.(ap\ (ap\ (c\_2Ecombin\_2ES\ A\_27a\ (A\_27a^{A\_27a}))\ A\_27a))$

Let  $c\_2Elist\_2ETL : \iota \Rightarrow \iota$  be given. Assume the following.

$$\forall A\_27a.nonempty\ A\_27a \Rightarrow c\_2Elist\_2ETL\ A\_27a \in ((ty\_2Elist\_2Elist\ A\_27a)^{(ty\_2Elist\_2Elist\ A\_27a)}) \quad (21)$$

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

$$c\_2Earithmetic\_2EEVEN \in (2^{ty\_2Enum\_2Enum}) \quad (22)$$

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

$$c\_2Earithmetic\_2EODD \in (2^{ty\_2Enum\_2Enum}) \quad (23)$$

**Definition 29** We define  $c\_2Earithmetic\_2E\_3E$  to be  $\lambda V0m \in ty\_2Enum\_2Enum.\lambda V1n \in ty\_2Enum\_2Enum$

**Definition 30** We define  $c\_2Ebool\_2E\_5C\_2F$  to be  $(\lambda V0t1 \in 2.(\lambda V1t2 \in 2.(ap\ (c\_2Ebool\_2E\_21\ 2)\ t1\ t2)))$

**Definition 31** We define  $c\_2Earithmetic\_2E\_3E\_3D$  to be  $\lambda V0m \in ty\_2Enum\_2Enum.\lambda V1n \in ty\_2Enum\_2Enum$

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

$$c\_2Enum\_2EZERO\_REP \in omega \quad (24)$$

**Definition 32** We define  $c\_2Enum\_2E0$  to be  $(ap\ c\_2Enum\_2EABS\_num\ c\_2Enum\_2EZERO\_REP)$ .

**Definition 33** We define  $c\_2Eprim\_rec\_2EPRE$  to be  $\lambda V0m \in ty\_2Enum\_2Enum.(ap\ (ap\ (ap\ (c\_2Ebool\_2E\_21\ 2)\ m)\ (c\_2Eprim\_rec\_2EPRE\ m))\ m)$

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

$$c\_2Earithmetic\_2EEXP \in ((ty\_2Enum\_2Enum^{ty\_2Enum\_2Enum})^{ty\_2Enum\_2Enum}) \quad (25)$$

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

$$c\_2Earithmetic\_2E\_2A \in ((ty\_2Enum\_2Enum^{ty\_2Enum\_2Enum})^{ty\_2Enum\_2Enum}) \quad (26)$$

**Definition 34** We define  $c\_2Enumeral\_2EiiSUC$  to be  $\lambda V0n \in ty\_2Enum\_2Enum.(ap\ c\_2Enum\_2ESUC\ (ap\ (c\_2Eprim\_rec\_2EPRE\ n)))$

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

$$c\_2Earithmetic\_2E\_2B \in ((ty\_2Enum\_2Enum^{ty\_2Enum\_2Enum})^{ty\_2Enum\_2Enum}) \quad (27)$$

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

**Definition 36** We define `c_2Earithmetic_2EBIT2` to be  $\lambda V0n \in ty\_2Enum\_2Enum.(ap (ap c\_2Earithmetic_2EBIT2 A\_27a))$ .

Let `c_2Elist_2EEL` :  $\iota \Rightarrow \iota$  be given. Assume the following.

$$\forall A\_27a.nonempty A\_27a \Rightarrow c\_2Elist\_2EEL A\_27a \in ((A\_27a^{(ty\_2Elist\_2Elist A\_27a)})^{ty\_2Enum\_2Enum}) \quad (28)$$

**Definition 37** We define `c_2Earithmetic_2EMIN` to be  $\lambda V0m \in ty\_2Enum\_2Enum.\lambda V1n \in ty\_2Enum\_2Enum.V0n$ .

Let `c_2Ewords_2Edimword` :  $\iota \Rightarrow \iota$  be given. Assume the following.

$$\forall A\_27a.nonempty A\_27a \Rightarrow c\_2Ewords\_2Edimword A\_27a \in (ty\_2Enum\_2Enum^{(ty\_2Ebool\_2Eitself A\_27a)}) \quad (29)$$

Let `c_2Earithmetic_2EMOD` :  $\iota$  be given. Assume the following.

$$c\_2Earithmetic\_2EMOD \in ((ty\_2Enum\_2Enum^{ty\_2Enum\_2Enum})^{ty\_2Enum\_2Enum}) \quad (30)$$

**Definition 38** We define `c_2Earithmetic_2EZERO` to be `c_2Enum_2E0`.

**Definition 39** We define `c_2Earithmetic_2ENUMERAL` to be  $\lambda V0x \in ty\_2Enum\_2Enum.V0x$ .

**Definition 40** We define `c_2Ebit_2ESBIT` to be  $\lambda V0b \in 2.\lambda V1n \in ty\_2Enum\_2Enum.(ap (ap (ap c\_2Ebool\_2ESBIT A\_27a)))$ .

Let `c_2Esum__num_2ESUM` :  $\iota$  be given. Assume the following.

$$c\_2Esum\_num\_2ESUM \in ((ty\_2Enum\_2Enum^{(ty\_2Enum\_2Enum^{ty\_2Enum\_2Enum})})^{ty\_2Enum\_2Enum}) \quad (31)$$

**Definition 41** We define `c_2Ewords_2Ew2n` to be  $\lambda A\_27a : \iota.\lambda V0w \in (ty\_2EfcP\_2Ecart 2 A\_27a).(ap (ap c\_2Ewords\_2Ew2n A\_27a))$ .

**Definition 42** We define `c_2Earithmetic_2EBIT1` to be  $\lambda V0n \in ty\_2Enum\_2Enum.(ap (ap c\_2Earithmetic_2EBIT1 A\_27a))$ .

Let `c_2Earithmetic_2EDIV` :  $\iota$  be given. Assume the following.

$$c\_2Earithmetic\_2EDIV \in ((ty\_2Enum\_2Enum^{ty\_2Enum\_2Enum})^{ty\_2Enum\_2Enum}) \quad (32)$$

**Definition 43** We define `c_2Ebit_2EDIV__2EXP` to be  $\lambda V0x \in ty\_2Enum\_2Enum.\lambda V1n \in ty\_2Enum\_2Enum.V0n$ .

**Definition 44** We define `c_2Ebit_2EMOD__2EXP` to be  $\lambda V0x \in ty\_2Enum\_2Enum.\lambda V1n \in ty\_2Enum\_2Enum.V0n$ .

**Definition 45** We define `c_2Ebit_2EBITS` to be  $\lambda V0h \in ty\_2Enum\_2Enum.\lambda V1l \in ty\_2Enum\_2Enum.V0l$ .

**Definition 46** We define `c_2Ebit_2EBIT` to be  $\lambda V0b \in ty\_2Enum\_2Enum.\lambda V1n \in ty\_2Enum\_2Enum.(ap (ap c\_2Ebit\_2EBIT A\_27a))$ .

**Definition 47** We define `c_2Ewords_2En2w` to be  $\lambda A\_27a : \iota.\lambda V0n \in ty\_2Enum\_2Enum.(ap (c\_2EfcP\_2EFC A\_27a))$ .

**Definition 48** We define `c_2Ewords_2Eword__2comp` to be  $\lambda A\_27a : \iota.\lambda V0w \in (ty\_2EfcP\_2Ecart 2 A\_27a).$

**Definition 49** We define  $c\_2Earithmic\_2E\_3C\_3D$  to be  $\lambda V0m \in ty\_2Enum\_2Enum.\lambda V1n \in ty\_2Enum\_2Enum.$

**Definition 50** We define  $c\_2Ewords\_2Eword\_lslr$  to be  $\lambda A\_27a : \iota.\lambda V0w \in (ty\_2Efcpl\_2Ecart\ 2\ A\_27a).\lambda V1w \in ty\_2Enum\_2Enum.$

Let  $c\_2Ewords\_2EUINT\_MAX : \iota \Rightarrow \iota$  be given. Assume the following.

$$\forall A\_27a.nonempty\ A\_27a \Rightarrow c\_2Ewords\_2EUINT\_MAX\ A\_27a \in ( ty\_2Enum\_2Enum^{(ty\_2Ebool\_2Eitself\ A\_27a)} ) \quad (33)$$

**Definition 51** We define  $c\_2Ewords\_2Eword\_T$  to be  $\lambda A\_27a : \iota.(ap\ (c\_2Ewords\_2En2w\ A\_27a)\ (ap\ (c\_2Eword\_lslr\ A\_27a)\ V1w))$

**Definition 52** We define  $c\_2Ewords\_2Eword\_slice$  to be  $\lambda A\_27a : \iota.\lambda V0h \in ty\_2Enum\_2Enum.\lambda V1l \in ty\_2Enum\_2Enum.$

**Definition 53** We define  $c\_2Ewords\_2Eword\_or$  to be  $\lambda A\_27a : \iota.\lambda V0v \in (ty\_2Efcpl\_2Ecart\ 2\ A\_27a).\lambda V1v \in ty\_2Enum\_2Enum.$

**Definition 54** We define  $c\_2Ewords\_2Eword\_msb$  to be  $\lambda A\_27a : \iota.\lambda V0w \in (ty\_2Efcpl\_2Ecart\ 2\ A\_27a).(ap\ (c\_2Eword\_lslr\ A\_27a)\ V1w)$

**Definition 55** We define  $c\_2Ewords\_2Eword\_asr$  to be  $\lambda A\_27a : \iota.\lambda V0w \in (ty\_2Efcpl\_2Ecart\ 2\ A\_27a).\lambda V1w \in ty\_2Enum\_2Enum.$

**Definition 56** We define  $c\_2Ewords\_2Eword\_bit$  to be  $\lambda A\_27a : \iota.\lambda V0b \in ty\_2Enum\_2Enum.\lambda V1w \in (ty\_2Enum\_2Enum.$

Assume the following.

$$(\forall V0m \in ty\_2Enum\_2Enum.((ap\ (ap\ c\_2Earithmic\_2E\_2B\ V0m)\ c\_2Enum\_2E0) = V0m)) \quad (34)$$

Assume the following.

$$\begin{aligned} & (\forall V0m \in ty\_2Enum\_2Enum.(\forall V1n \in ty\_2Enum\_2Enum.( \\ & ((ap\ (ap\ c\_2Earithmic\_2E\_2B\ c\_2Enum\_2E0)\ V0m) = V0m) \wedge (((ap\ ( \\ & ap\ c\_2Earithmic\_2E\_2B\ V0m)\ c\_2Enum\_2E0) = V0m) \wedge (((ap\ (ap\ c\_2Earithmic\_2E\_2B \\ & (ap\ c\_2Enum\_2ESUC\ V0m))\ V1n) = (ap\ c\_2Enum\_2ESUC\ (ap\ (ap\ c\_2Earithmic\_2E\_2B \\ & V0m)\ V1n))) \wedge ((ap\ (ap\ c\_2Earithmic\_2E\_2B\ V0m)\ (ap\ c\_2Enum\_2ESUC \\ & V1n)) = (ap\ c\_2Enum\_2ESUC\ (ap\ (ap\ c\_2Earithmic\_2E\_2B\ V0m)\ V1n))))))))) \end{aligned} \quad (35)$$

Assume the following.

$$\begin{aligned} & (\forall V0m \in ty\_2Enum\_2Enum.(\forall V1n \in ty\_2Enum\_2Enum.( \\ & (ap\ (ap\ c\_2Earithmic\_2E\_2B\ V0m)\ V1n) = (ap\ (ap\ c\_2Earithmic\_2E\_2B \\ & V1n)\ V0m)))) \end{aligned} \quad (36)$$

Assume the following.

$$\begin{aligned} & (\forall V0m \in ty\_2Enum\_2Enum.(\forall V1n \in ty\_2Enum\_2Enum.( \\ & (ap\ (ap\ c\_2Earithmic\_2E\_2B\ V0m)\ V1n) = (ap\ (ap\ c\_2Earithmic\_2E\_2B \\ & V1n)\ V0m)))) \end{aligned} \quad (37)$$

Assume the following.

$$\begin{aligned}
& (\forall V0m \in ty\_2Enum\_2Enum. (\forall V1n \in ty\_2Enum\_2Enum. ( \\
& \quad \forall V2p \in ty\_2Enum\_2Enum. ((ap (ap c\_2Earithmetic\_2E\_2B V0m) \\
& (ap (ap c\_2Earithmetic\_2E\_2B V1n) V2p)) = (ap (ap c\_2Earithmetic\_2E\_2B \\
& \quad (ap (ap c\_2Earithmetic\_2E\_2B V0m) V1n)) V2p))))))
\end{aligned} \tag{38}$$

Assume the following.

$$\begin{aligned}
& (\forall V0m \in ty\_2Enum\_2Enum. (\forall V1n \in ty\_2Enum\_2Enum. ( \\
& (p (ap (ap c\_2Eprim\_rec\_2E\_3C V0m) V1n)) \Leftrightarrow (p (ap (ap c\_2Earithmetic\_2E\_3C\_3D \\
& \quad (ap c\_2Enum\_2ESUC V0m)) V1n))))))
\end{aligned} \tag{39}$$

Assume the following.

$$\begin{aligned}
& (\forall V0n \in ty\_2Enum\_2Enum. (p (ap (ap c\_2Earithmetic\_2E\_3C\_3D \\
& \quad c\_2Enum\_2E0) V0n)))
\end{aligned} \tag{40}$$

Assume the following.

$$\begin{aligned}
& (\forall V0m \in ty\_2Enum\_2Enum. (\forall V1n \in ty\_2Enum\_2Enum. ( \\
& (\neg (p (ap (ap c\_2Eprim\_rec\_2E\_3C V0m) V1n))) \Leftrightarrow (p (ap (ap c\_2Earithmetic\_2E\_3C\_3D \\
& \quad V1n) V0m))))))
\end{aligned} \tag{41}$$

Assume the following.

$$\begin{aligned}
& (\forall V0m \in ty\_2Enum\_2Enum. (\forall V1n \in ty\_2Enum\_2Enum. ( \\
& (\neg (p (ap (ap c\_2Earithmetic\_2E\_3C\_3D V0m) V1n))) \Leftrightarrow (p (ap (ap c\_2Eprim\_rec\_2E\_3C \\
& \quad V1n) V0m))))))
\end{aligned} \tag{42}$$

Assume the following.

$$\begin{aligned}
& (\forall V0n \in ty\_2Enum\_2Enum. ((p (ap (ap c\_2Earithmetic\_2E\_3C\_3D \\
& \quad V0n) c\_2Enum\_2E0)) \Leftrightarrow (V0n = c\_2Enum\_2E0)))
\end{aligned} \tag{43}$$

Assume the following.

$$\begin{aligned}
& (\forall V0m \in ty\_2Enum\_2Enum. (((ap (ap c\_2Earithmetic\_2E\_2D \\
& c\_2Enum\_2E0) V0m) = c\_2Enum\_2E0) \wedge ((ap (ap c\_2Earithmetic\_2E\_2D \\
& \quad V0m) c\_2Enum\_2E0) = V0m)))
\end{aligned} \tag{44}$$

Assume the following.

$$\begin{aligned}
& (\forall V0m \in ty\_2Enum\_2Enum. (\forall V1n \in ty\_2Enum\_2Enum. ( \\
& ((ap (ap c\_2Earithmetic\_2E\_2A c\_2Enum\_2E0) V0m) = c\_2Enum\_2E0) \wedge \\
& (((ap (ap c\_2Earithmetic\_2E\_2A V0m) c\_2Enum\_2E0) = c\_2Enum\_2E0) \wedge \\
& (((ap (ap c\_2Earithmetic\_2E\_2A (ap c\_2Earithmetic\_2ENUMERAL \\
& (ap c\_2Earithmetic\_2EBIT1 c\_2Earithmetic\_2EZERO))) V0m) = V0m) \wedge \\
& (((ap (ap c\_2Earithmetic\_2E\_2A V0m) (ap c\_2Earithmetic\_2ENUMERAL \\
& (ap c\_2Earithmetic\_2EBIT1 c\_2Earithmetic\_2EZERO))) = V0m) \wedge ( \\
& ((ap (ap c\_2Earithmetic\_2E\_2A (ap c\_2Enum\_2ESUC V0m)) V1n) = (ap \\
& (ap c\_2Earithmetic\_2E\_2B (ap (ap c\_2Earithmetic\_2E\_2A V0m) V1n)) \\
& V1n)) \wedge ((ap (ap c\_2Earithmetic\_2E\_2A V0m) (ap c\_2Enum\_2ESUC V1n)) = \\
& (ap (ap c\_2Earithmetic\_2E\_2B V0m) (ap (ap c\_2Earithmetic\_2E\_2A \\
& V0m) V1n)))))))))
\end{aligned} \tag{45}$$

Assume the following.

$$\begin{aligned}
& (\forall V0m \in ty\_2Enum\_2Enum. (\forall V1n \in ty\_2Enum\_2Enum. ( \\
& \forall V2p \in ty\_2Enum\_2Enum. (((p (ap (ap c\_2Earithmetic\_2E\_3C\_3D \\
& V0m) V1n)) \wedge (p (ap (ap c\_2Earithmetic\_2E\_3C\_3D V1n) V2p))) \Rightarrow (p ( \\
& ap (ap c\_2Earithmetic\_2E\_3C\_3D V0m) V2p))))))
\end{aligned} \tag{46}$$

Assume the following.

$$\begin{aligned}
& (\forall V0c \in ty\_2Enum\_2Enum. ((ap (ap c\_2Earithmetic\_2E\_2D V0c) \\
& V0c) = c\_2Enum\_2E0))
\end{aligned} \tag{47}$$

Assume the following.

$$\begin{aligned}
& (\forall V0m \in ty\_2Enum\_2Enum. (\forall V1n \in ty\_2Enum\_2Enum. ( \\
& (V0m = V1n) \Leftrightarrow ((p (ap (ap c\_2Earithmetic\_2E\_3C\_3D V0m) V1n)) \wedge (p ( \\
& ap (ap c\_2Earithmetic\_2E\_3C\_3D V1n) V0m))))))
\end{aligned} \tag{48}$$

Assume the following.

$$\begin{aligned}
& (\forall V0m \in ty\_2Enum\_2Enum. (\forall V1n \in ty\_2Enum\_2Enum. ( \\
& \forall V2p \in ty\_2Enum\_2Enum. (((p (ap (ap c\_2Earithmetic\_2E\_3C\_3D \\
& (ap (ap c\_2Earithmetic\_2E\_2B V0m) V1n)) (ap (ap c\_2Earithmetic\_2E\_2B \\
& V0m) V2p))) \Leftrightarrow (p (ap (ap c\_2Earithmetic\_2E\_3C\_3D V1n) V2p))))))
\end{aligned} \tag{49}$$

Assume the following.

$$\begin{aligned}
& (\forall V0m \in ty\_2Enum\_2Enum. (\forall V1n \in ty\_2Enum\_2Enum. ( \\
& (\neg (p (ap (ap c\_2Earithmetic\_2E\_3C\_3D V0m) V1n))) \Leftrightarrow (p (ap (ap c\_2Earithmetic\_2E\_3C\_3D \\
& (ap c\_2Enum\_2ESUC V1n)) V0m))))))
\end{aligned} \tag{50}$$



Assume the following.

$$\begin{aligned}
& (\forall V0m \in ty\_2Enum\_2Enum. (\forall V1n \in ty\_2Enum\_2Enum. ( \\
& (\neg(V0m = V1n)) \Leftrightarrow ((p (ap (ap c\_2Earithmetic\_2E\_3C\_3D (ap c\_2Enum\_2ESUC \\
& V0m)) V1n)) \vee (p (ap (ap c\_2Earithmetic\_2E\_3C\_3D (ap c\_2Enum\_2ESUC \\
& V1n)) V0m))))))
\end{aligned} \tag{51}$$

Assume the following.

$$\begin{aligned}
& (\forall V0n \in ty\_2Enum\_2Enum. ((ap c\_2Enum\_2ESUC V0n) = (ap (ap \\
& c\_2Earithmetic\_2E\_2B (ap c\_2Earithmetic\_2ENUMERAL (ap c\_2Earithmetic\_2EBIT1 \\
& c\_2Earithmetic\_2EZERO))) V0n)))
\end{aligned} \tag{52}$$

Assume the following.

$$\begin{aligned}
& (\forall V0m \in ty\_2Enum\_2Enum. (\forall V1n \in ty\_2Enum\_2Enum. ( \\
& \forall V2p \in ty\_2Enum\_2Enum. ((ap (ap c\_2Earithmetic\_2E\_2D (ap \\
& (ap c\_2Earithmetic\_2E\_2D V0m) V1n)) V2p) = (ap (ap c\_2Earithmetic\_2E\_2D \\
& V0m) (ap (ap c\_2Earithmetic\_2E\_2B V1n) V2p))))))
\end{aligned} \tag{53}$$

Assume the following.

$$\begin{aligned}
& (\forall V0m \in ty\_2Enum\_2Enum. (\forall V1n \in ty\_2Enum\_2Enum. ( \\
& \forall V2p \in ty\_2Enum\_2Enum. ((p (ap (ap c\_2Earithmetic\_2E\_3C\_3D \\
& V0m) (ap (ap c\_2Earithmetic\_2E\_2D V1n) V2p))) \Leftrightarrow ((p (ap (ap c\_2Earithmetic\_2E\_3C\_3D \\
& (ap (ap c\_2Earithmetic\_2E\_2B V0m) V2p)) V1n)) \vee (p (ap (ap c\_2Earithmetic\_2E\_3C\_3D \\
& V0m) c\_2Enum\_2E0))))))
\end{aligned} \tag{54}$$

Assume the following.

$$\begin{aligned}
& (\forall V0m \in ty\_2Enum\_2Enum. (\forall V1n \in ty\_2Enum\_2Enum. ( \\
& \forall V2p \in ty\_2Enum\_2Enum. ((p (ap (ap c\_2Earithmetic\_2E\_3C\_3D \\
& (ap (ap c\_2Earithmetic\_2E\_2D V0m) V1n)) V2p))) \Leftrightarrow (p (ap (ap c\_2Earithmetic\_2E\_3C\_3D \\
& V0m) (ap (ap c\_2Earithmetic\_2E\_2B V1n) V2p))))))
\end{aligned} \tag{55}$$

Assume the following.

$$\begin{aligned}
& (\forall V0m \in ty\_2Enum\_2Enum. (\forall V1n \in ty\_2Enum\_2Enum. ( \\
& \forall V2p \in ty\_2Enum\_2Enum. ((p (ap (ap c\_2Eprim\_rec\_2E\_3C V0m) \\
& (ap (ap c\_2Earithmetic\_2E\_2D V1n) V2p))) \Leftrightarrow (p (ap (ap c\_2Eprim\_rec\_2E\_3C \\
& (ap (ap c\_2Earithmetic\_2E\_2B V0m) V2p)) V1n))))))
\end{aligned} \tag{56}$$

Assume the following.

$$\begin{aligned}
& (\forall V0m \in ty\_2Enum\_2Enum. (\forall V1n \in ty\_2Enum\_2Enum. ( \\
& \forall V2p \in ty\_2Enum\_2Enum. ((p (ap (ap c\_2Eprim\_rec\_2E\_3C ( \\
& ap (ap c\_2Earithmetic\_2E\_2D V0m) V1n)) V2p))) \Leftrightarrow ((p (ap (ap c\_2Eprim\_rec\_2E\_3C \\
& V0m) (ap (ap c\_2Earithmetic\_2E\_2B V1n) V2p))) \wedge (p (ap (ap c\_2Eprim\_rec\_2E\_3C \\
& c\_2Enum\_2E0) V2p))))))
\end{aligned} \tag{57}$$

Assume the following.

$$\begin{aligned}
& (\forall V0P \in (2^{ty\_2Enum\_2Enum}).(\forall V1a \in ty\_2Enum\_2Enum. \\
& (\forall V2b \in ty\_2Enum\_2Enum.((p (ap V0P (ap (ap c\_2Earithmetic\_2E\_2D \\
& V1a) V2b))) \Leftrightarrow (\forall V3d \in ty\_2Enum\_2Enum.(((V2b = (ap (ap c\_2Earithmetic\_2E\_2B \\
& V1a) V3d)) \Rightarrow (p (ap V0P c\_2Enum\_2E0))) \wedge ((V1a = (ap (ap c\_2Earithmetic\_2E\_2B \\
& V2b) V3d)) \Rightarrow (p (ap V0P V3d))))))))))
\end{aligned} \tag{58}$$

Assume the following.

$$\begin{aligned}
& (\forall V0n \in ty\_2Enum\_2Enum.(\forall V1m \in ty\_2Enum\_2Enum.( \\
& \forall V2p \in ty\_2Enum\_2Enum.(((p (ap (ap c\_2Earithmetic\_2E\_3C\_3D \\
& (ap (ap c\_2Earithmetic\_2EMIN V1m) V0n)) V2p)) \Leftrightarrow ((p (ap (ap c\_2Earithmetic\_2E\_3C\_3D \\
& V1m) V2p)) \vee (p (ap (ap c\_2Earithmetic\_2E\_3C\_3D V0n) V2p)))) \wedge (( \\
& p (ap (ap c\_2Earithmetic\_2E\_3C\_3D V2p) (ap (ap c\_2Earithmetic\_2EMIN \\
& V1m) V0n))) \Leftrightarrow ((p (ap (ap c\_2Earithmetic\_2E\_3C\_3D V2p) V1m)) \wedge (p \\
& (ap (ap c\_2Earithmetic\_2E\_3C\_3D V2p) V0n))))))
\end{aligned} \tag{59}$$

Assume the following.

$$\begin{aligned}
& (\forall V0n \in ty\_2Enum\_2Enum.(\forall V1v \in (ty\_2Elist\_2Elist \\
& 2).((ap (c\_2Elist\_2ELENGTH 2) (ap (ap c\_2Ebitstring\_2Efixwidth \\
& V0n) V1v)) = V0n)))
\end{aligned} \tag{60}$$

Assume the following.

$$\begin{aligned}
& (\forall V0v \in (ty\_2Elist\_2Elist 2).(\forall V1n \in ty\_2Enum\_2Enum. \\
& ((ap (c\_2Elist\_2ELENGTH 2) (ap (ap c\_2Ebitstring\_2Eshiftr V0v) \\
& V1n)) = (ap (ap c\_2Earithmetic\_2E\_2D (ap (c\_2Elist\_2ELENGTH 2) \\
& V0v)) V1n))))
\end{aligned} \tag{61}$$

Assume the following.

$$\begin{aligned}
& (\forall V0i \in ty\_2Enum\_2Enum.(\forall V1n \in ty\_2Enum\_2Enum.( \\
& \forall V2w \in (ty\_2Elist\_2Elist 2).((p (ap (ap c\_2Eprim\_rec\_2E\_3C \\
& V0i) V1n)) \Rightarrow ((p (ap (ap (c\_2Elist\_2EEL 2) V0i) (ap (ap c\_2Ebitstring\_2Efixwidth \\
& V1n) V2w))) \Leftrightarrow (p (ap (ap (ap (c\_2Ebool\_2ECOND 2) (ap (ap c\_2Eprim\_rec\_2E\_3C \\
& (ap (c\_2Elist\_2ELENGTH 2) V2w)) V1n)) (ap (ap c\_2Ebool\_2E\_2F\_5C \\
& (ap (ap c\_2Earithmetic\_2E\_3C\_3D (ap (ap c\_2Earithmetic\_2E\_2D \\
& V1n) (ap (c\_2Elist\_2ELENGTH 2) V2w))) V0i)) (ap (ap (c\_2Elist\_2EEL \\
& 2) (ap (ap c\_2Earithmetic\_2E\_2D V0i) (ap (ap c\_2Earithmetic\_2E\_2D \\
& V1n) (ap (c\_2Elist\_2ELENGTH 2) V2w)))) V2w))) (ap (ap (c\_2Elist\_2EEL \\
& 2) (ap (ap c\_2Earithmetic\_2E\_2B V0i) (ap (ap c\_2Earithmetic\_2E\_2D \\
& (ap (c\_2Elist\_2ELENGTH 2) V2w)) V1n)) V2w))))))
\end{aligned} \tag{62}$$

Assume the following.

$$\begin{aligned}
& (\forall V0i \in ty\_2Enum\_2Enum. (\forall V1v \in (ty\_2Elist\_2Elist \\
& \quad 2). (\forall V2n \in ty\_2Enum\_2Enum. (\forall V3d \in ty\_2Enum\_2Enum. \\
& \quad ((p (ap (ap c\_2Eprim\_rec\_2E\_3C V2n) V3d)) \wedge ((p (ap (ap c\_2Eprim\_rec\_2E\_3C \\
& \quad V0i) (ap (ap c\_2Earithmetic\_2E\_2D V3d) V2n))) \wedge (p (ap (ap c\_2Eprim\_rec\_2E\_3C \\
& \quad \quad c\_2Enum\_2E0) V3d)))) \Rightarrow ((p (ap (ap (c\_2Elist\_2EEL 2) V0i) (ap (ap \\
& \quad \quad c\_2Ebitstring\_2Eshiftr (ap (ap c\_2Ebitstring\_2Efixwidth V3d) \\
& \quad V1v)) V2n))) \Leftrightarrow ((p (ap (ap c\_2Earithmetic\_2E\_3C\_3D V3d) (ap (ap c\_2Earithmetic\_2E\_2B \\
& \quad V0i) (ap (c\_2Elist\_2ELENGTH 2) V1v)))) \wedge (p (ap (ap (c\_2Elist\_2EEL \\
& \quad \quad 2) (ap (ap c\_2Earithmetic\_2E\_2D (ap (ap c\_2Earithmetic\_2E\_2B \\
& \quad \quad V0i) (ap (c\_2Elist\_2ELENGTH 2) V1v))) V3d)) V1v))))))))) \\
& \hspace{15em} (63)
\end{aligned}$$

Assume the following.

$$\begin{aligned}
& (\forall V0b \in ty\_2Enum\_2Enum. (\forall V1v \in (ty\_2Elist\_2Elist \\
& \quad 2). ((p (ap (ap c\_2Ebitstring\_2Etestbit V0b) V1v)) \Leftrightarrow (p (ap (ap ( \\
& \quad c\_2Ebool\_2ELET ty\_2Enum\_2Enum 2) (\lambda V2n \in ty\_2Enum\_2Enum. \\
& \quad (ap (ap c\_2Ebool\_2E\_2F\_5C (ap (ap c\_2Eprim\_rec\_2E\_3C V0b) V2n)) \\
& \quad (ap (ap (c\_2Elist\_2EEL 2) (ap (ap c\_2Earithmetic\_2E\_2D (ap (ap \\
& \quad c\_2Earithmetic\_2E\_2D V2n) (ap c\_2Earithmetic\_2ENUMERAL (ap c\_2Earithmetic\_2EBIT1 \\
& \quad c\_2Earithmetic\_2EZERO)))) V0b)) V1v)))) (ap (c\_2Elist\_2ELENGTH \\
& \quad \quad 2) V1v)))))) \\
& \hspace{15em} (64)
\end{aligned}$$

Assume the following.

$$\begin{aligned}
& \forall A\_27a.nonempty A\_27a \Rightarrow (\forall V0n \in ty\_2Enum\_2Enum. ( \\
& \quad \forall V1v \in (ty\_2Elist\_2Elist 2). ((p (ap (ap (c\_2Ewords\_2Eword\_bit \\
& \quad A\_27a) V0n) (ap (c\_2Ebitstring\_2Ev2w A\_27a) V1v))) \Leftrightarrow ((p (ap (ap \\
& \quad c\_2Eprim\_rec\_2E\_3C V0n) (ap (c\_2Efc\_2Edimindex A\_27a) (c\_2Ebool\_2Ethe\_value \\
& \quad A\_27a)))) \wedge (p (ap (ap c\_2Ebitstring\_2Etestbit V0n) V1v)))))) \\
& \hspace{15em} (65)
\end{aligned}$$

Assume the following.

$$\begin{aligned}
& \forall A\_27a.nonempty A\_27a \Rightarrow (\forall V0v \in (ty\_2Elist\_2Elist \\
& \quad 2). ((p (ap (c\_2Ewords\_2Eword\_msb A\_27a) (ap (c\_2Ebitstring\_2Ev2w \\
& \quad A\_27a) V0v))) \Leftrightarrow (p (ap (ap c\_2Ebitstring\_2Etestbit (ap (ap c\_2Earithmetic\_2E\_2D \\
& \quad (ap (c\_2Efc\_2Edimindex A\_27a) (c\_2Ebool\_2Ethe\_value A\_27a))) \\
& \quad (ap c\_2Earithmetic\_2ENUMERAL (ap c\_2Earithmetic\_2EBIT1 c\_2Earithmetic\_2EZERO)))) \\
& \quad \quad V0v)))) \\
& \hspace{15em} (66)
\end{aligned}$$

Assume the following.

$$\begin{aligned} & \forall A\_27a.nonempty\ A\_27a \Rightarrow (\forall V0n \in ty\_2Enum\_2Enum.( \\ & \quad \forall V1v \in (ty\_2Elist\_2Elist\ 2).((ap\ (ap\ (c\_2Ewords\_2Eword\_lsr \\ A\_27a)\ (ap\ (c\_2Ebitstring\_2Ev2w\ A\_27a)\ V1v))\ V0n) = (ap\ (c\_2Ebitstring\_2Ev2w \\ A\_27a)\ (ap\ (ap\ c\_2Ebitstring\_2Eshiftr\ (ap\ (ap\ c\_2Ebitstring\_2Efixwidth \\ (ap\ (c\_2Efcpl\_2Edimindex\ A\_27a)\ (c\_2Ebool\_2Ethe\_value\ A\_27a))) \\ V1v))\ V0n)))))) \end{aligned} \quad (67)$$

Assume the following.

$$True \quad (68)$$

Assume the following.

$$\begin{aligned} & (\forall V0t1 \in 2.(\forall V1t2 \in 2.(((p\ V0t1) \Rightarrow (p\ V1t2)) \Rightarrow (((p \\ V1t2) \Rightarrow (p\ V0t1)) \Rightarrow ((p\ V0t1) \Leftrightarrow (p\ V1t2)))))) \end{aligned} \quad (69)$$

Assume the following.

$$(\forall V0t \in 2.(False \Rightarrow (p\ V0t))) \quad (70)$$

Assume the following.

$$(\forall V0t \in 2.((p\ V0t) \vee (\neg(p\ V0t)))) \quad (71)$$

Assume the following.

$$\begin{aligned} & \forall A\_27a.nonempty\ A\_27a \Rightarrow \forall A\_27b.nonempty\ A\_27b \Rightarrow ( \\ \forall V0f \in (A\_27b^{A\_27a}).(\forall V1x \in A\_27a.((ap\ (ap\ (c\_2Ebool\_2ELET \\ A\_27a\ A\_27b)\ V0f)\ V1x) = (ap\ V0f\ V1x)))) \end{aligned} \quad (72)$$

Assume the following.

$$\begin{aligned} & \forall A\_27a.nonempty\ A\_27a \Rightarrow (\forall V0t \in 2.((\forall V1x \in \\ A\_27a.(p\ V0t)) \Leftrightarrow (p\ V0t))) \end{aligned} \quad (73)$$

Assume the following.

$$\begin{aligned} & (\forall V0t1 \in 2.(\forall V1t2 \in 2.(\forall V2t3 \in 2.(((p\ V0t1) \wedge \\ ((p\ V1t2) \wedge (p\ V2t3))) \Leftrightarrow (((p\ V0t1) \wedge (p\ V1t2)) \wedge (p\ V2t3)))))) \end{aligned} \quad (74)$$

Assume the following.

$$\begin{aligned} & (\forall V0t \in 2.(((True \wedge (p\ V0t)) \Leftrightarrow (p\ V0t)) \wedge (((p\ V0t) \wedge True) \Leftrightarrow \\ (p\ V0t)) \wedge (((False \wedge (p\ V0t)) \Leftrightarrow False) \wedge (((p\ V0t) \wedge False) \Leftrightarrow False) \wedge \\ (((p\ V0t) \wedge (p\ V0t)) \Leftrightarrow (p\ V0t)))))) \end{aligned} \quad (75)$$

Assume the following.

$$\begin{aligned} & (\forall V0t \in 2.(((True \vee (p\ V0t)) \Leftrightarrow True) \wedge (((p\ V0t) \vee True) \Leftrightarrow True) \wedge \\ (((False \vee (p\ V0t)) \Leftrightarrow (p\ V0t)) \wedge (((p\ V0t) \vee False) \Leftrightarrow (p\ V0t)) \wedge (((p\ V0t) \vee \\ (p\ V0t)) \Leftrightarrow (p\ V0t)))))) \end{aligned} \quad (76)$$

Assume the following.

$$(\forall V0t \in 2.(((True \Rightarrow (p V0t)) \Leftrightarrow (p V0t)) \wedge (((p V0t) \Rightarrow True) \Leftrightarrow True) \wedge (((False \Rightarrow (p V0t)) \Leftrightarrow True) \wedge (((p V0t) \Rightarrow (p V0t)) \Leftrightarrow True) \wedge ((p V0t) \Rightarrow False) \Leftrightarrow (\neg (p V0t)))))) \quad (77)$$

Assume the following.

$$((\forall V0t \in 2.((\neg(\neg(p V0t))) \Leftrightarrow (p V0t)) \wedge ((\neg True) \Leftrightarrow False) \wedge ((\neg False) \Leftrightarrow True))) \quad (78)$$

Assume the following.

$$\forall A\_27a.nonempty A\_27a \Rightarrow (\forall V0x \in A\_27a.((V0x = V0x) \Leftrightarrow True)) \quad (79)$$

Assume the following.

$$\forall A\_27a.nonempty A\_27a \Rightarrow (\forall V0x \in A\_27a.(\forall V1y \in A\_27a.((V0x = V1y) \Leftrightarrow (V1y = V0x)))) \quad (80)$$

Assume the following.

$$(\forall V0t \in 2.(((True \Leftrightarrow (p V0t)) \Leftrightarrow (p V0t)) \wedge (((p V0t) \Leftrightarrow True) \Leftrightarrow (p V0t)) \wedge (((False \Leftrightarrow (p V0t)) \Leftrightarrow (\neg(p V0t))) \wedge (((p V0t) \Leftrightarrow False) \Leftrightarrow (\neg(p V0t)))))) \quad (81)$$

Assume the following.

$$\forall A\_27a.nonempty A\_27a \Rightarrow (\forall V0t1 \in A\_27a.(\forall V1t2 \in A\_27a.(((ap (ap (ap (c\_2Ebool\_2ECOND A\_27a) c\_2Ebool\_2ET) V0t1) V1t2) = V0t1) \wedge ((ap (ap (c\_2Ebool\_2ECOND A\_27a) c\_2Ebool\_2EF) V0t1) V1t2) = V1t2)))) \quad (82)$$

Assume the following.

$$(\forall V0A \in 2.(\forall V1B \in 2.(\forall V2C \in 2.(((p V0A) \vee (p V1B) \vee (p V2C)) \Leftrightarrow (((p V0A) \vee (p V1B)) \vee (p V2C)))))) \quad (83)$$

Assume the following.

$$(\forall V0A \in 2.(\forall V1B \in 2.(((\neg((p V0A) \wedge (p V1B))) \Leftrightarrow ((\neg(p V0A) \vee \neg(p V1B)))) \wedge (((\neg(p V0A) \vee (p V1B)) \Leftrightarrow ((\neg(p V0A)) \wedge (\neg(p V1B))))))) \quad (84)$$

Assume the following.

$$(\forall V0A \in 2.(\forall V1B \in 2.(((p V0A) \Rightarrow (p V1B)) \Leftrightarrow ((\neg(p V0A)) \vee (p V1B)))) \quad (85)$$

Assume the following.

$$(\forall V0t \in 2.(((p V0t) \Rightarrow False) \Leftrightarrow ((p V0t) \Leftrightarrow False))) \quad (86)$$

Assume the following.

$$(\forall V0t1 \in 2. (\forall V1t2 \in 2. (\forall V2t3 \in 2. (((p V0t1) \Rightarrow ((p V1t2) \Rightarrow (p V2t3))) \Leftrightarrow (((p V0t1) \wedge (p V1t2)) \Rightarrow (p V2t3)))))) \quad (87)$$

Assume the following.

$$(\forall V0t1 \in 2. (\forall V1t2 \in 2. (((p V0t1) \Leftrightarrow (p V1t2)) \Leftrightarrow (((p V0t1) \wedge (p V1t2)) \vee ((\neg(p V0t1)) \wedge (\neg(p V1t2)))))) \quad (88)$$

Assume the following.

$$(\forall V0x \in 2. (\forall V1x\_27 \in 2. (\forall V2y \in 2. (\forall V3y\_27 \in 2. (((((p V0x) \Leftrightarrow (p V1x\_27)) \wedge ((p V1x\_27) \Rightarrow ((p V2y) \Leftrightarrow (p V3y\_27)))) \Rightarrow ((p V0x) \Rightarrow (p V2y)) \Leftrightarrow ((p V1x\_27) \Rightarrow (p V3y\_27)))))) \quad (89)$$

Assume the following.

$$(\forall V0P \in 2. (\forall V1P\_27 \in 2. (\forall V2Q \in 2. (\forall V3Q\_27 \in 2. (((((p V2Q) \Rightarrow ((p V0P) \Leftrightarrow (p V1P\_27))) \wedge ((p V1P\_27) \Rightarrow ((p V2Q) \Leftrightarrow (p V3Q\_27)))) \Rightarrow (((p V0P) \wedge (p V2Q)) \Leftrightarrow ((p V1P\_27) \wedge (p V3Q\_27)))))) \quad (90)$$

Assume the following.

$$\forall A\_27a.nonempty A\_27a \Rightarrow (\forall V0P \in 2. (\forall V1Q \in 2. (\forall V2x \in A\_27a. (\forall V3x\_27 \in A\_27a. (\forall V4y \in A\_27a. (\forall V5y\_27 \in A\_27a. (((((p V0P) \Leftrightarrow (p V1Q)) \wedge (((p V1Q) \Rightarrow (V2x = V3x\_27)) \wedge ((\neg(p V1Q)) \Rightarrow (V4y = V5y\_27)))) \Rightarrow ((ap (ap (ap (c.2Ebool\_2ECOND A\_27a) V0P) V2x) V4y) = (ap (ap (ap (c.2Ebool\_2ECOND A\_27a) V1Q) V3x\_27) V5y\_27)))))) \quad (91)$$

Assume the following.

$$\forall A\_27a.nonempty A\_27a \Rightarrow ((\forall V0t1 \in A\_27a. (\forall V1t2 \in A\_27a. ((ap (ap (ap (c.2Ebool\_2ECOND A\_27a) c.2Ebool\_2ET) V0t1) V1t2) = V0t1))) \wedge (\forall V2t1 \in A\_27a. (\forall V3t2 \in A\_27a. ((ap (ap (ap (c.2Ebool\_2ECOND A\_27a) c.2Ebool\_2EF) V2t1) V3t2) = V3t2)))) \quad (92)$$

Assume the following.

$$\forall A\_27a.nonempty A\_27a \Rightarrow \forall A\_27b.nonempty A\_27b \Rightarrow (\forall V0x \in A\_27a. (\forall V1y \in A\_27b. ((ap (ap (c.2Ecombin\_2EK A\_27a A\_27b) V0x) V1y) = V0x))) \quad (93)$$

Assume the following.

$$\forall A\_27a.nonempty A\_27a \Rightarrow (\forall V0x \in A\_27a. ((ap (c.2Ecombin\_2EI A\_27a) V0x) = V0x)) \quad (94)$$

Assume the following.

$$\begin{aligned} & \forall A\_27a.nonempty\ A\_27a \Rightarrow \forall A\_27b.nonempty\ A\_27b \Rightarrow ( \\ & \forall V0x \in (ty\_2EfcP\_2Ecart\ A\_27a\ A\_27b). (\forall V1y \in (ty\_2EfcP\_2Ecart \\ & A\_27a\ A\_27b). ((V0x = V1y) \Leftrightarrow (\forall V2i \in ty\_2Enum\_2Enum. ((p\ (ap \\ & (ap\ c\_2Eprim\_rec\_2E\_3C\ V2i)\ (ap\ (c\_2EfcP\_2Edimindex\ A\_27b)\ ( \\ & c\_2Ebool\_2Ethe\_value\ A\_27b)))) \Rightarrow ((ap\ (ap\ (c\_2EfcP\_2EfcP\_index \\ & A\_27a\ A\_27b)\ V0x)\ V2i) = (ap\ (ap\ (c\_2EfcP\_2EfcP\_index\ A\_27a\ A\_27b) \\ & V1y)\ V2i)))))) \end{aligned} \quad (95)$$

Assume the following.

$$\begin{aligned} & \forall A\_27a.nonempty\ A\_27a \Rightarrow \forall A\_27b.nonempty\ A\_27b \Rightarrow ( \\ & \forall V0g \in (A\_27a^{ty\_2Enum\_2Enum}). (\forall V1i \in ty\_2Enum\_2Enum. \\ & ((p\ (ap\ (ap\ c\_2Eprim\_rec\_2E\_3C\ V1i)\ (ap\ (c\_2EfcP\_2Edimindex\ A\_27b) \\ & (c\_2Ebool\_2Ethe\_value\ A\_27b)))) \Rightarrow ((ap\ (ap\ (c\_2EfcP\_2EfcP\_index \\ & A\_27a\ A\_27b)\ (ap\ (c\_2EfcP\_2EFCP\ A\_27a\ A\_27b)\ V0g))\ V1i) = (ap\ V0g \\ & V1i)))) \end{aligned} \quad (96)$$

Assume the following.

$$\begin{aligned} & \forall A\_27a.nonempty\ A\_27a \Rightarrow (\forall V0h \in A\_27a. (\forall V1t \in \\ & (ty\_2Elist\_2Elist\ A\_27a). ((ap\ (c\_2Elist\_2EHD\ A\_27a)\ (ap\ (ap\ ( \\ & c\_2Elist\_2ECONS\ A\_27a)\ V0h)\ V1t)) = V0h))) \end{aligned} \quad (97)$$

Assume the following.

$$\begin{aligned} & \forall A\_27a.nonempty\ A\_27a \Rightarrow (((ap\ (c\_2Elist\_2ELENGTH\ A\_27a) \\ & (c\_2Elist\_2ENIL\ A\_27a)) = c\_2Enum\_2E0) \wedge (\forall V0h \in A\_27a. ( \\ & \forall V1t \in (ty\_2Elist\_2Elist\ A\_27a). ((ap\ (c\_2Elist\_2ELENGTH \\ & A\_27a)\ (ap\ (ap\ (c\_2Elist\_2ECONS\ A\_27a)\ V0h)\ V1t)) = (ap\ c\_2Enum\_2ESUC \\ & (ap\ (c\_2Elist\_2ELENGTH\ A\_27a)\ V1t)))))) \end{aligned} \quad (98)$$

Assume the following.

$$\begin{aligned} & \forall A\_27a.nonempty\ A\_27a \Rightarrow ((\forall V0l \in (ty\_2Elist\_2Elist \\ & A\_27a). ((ap\ (ap\ (c\_2Elist\_2EEL\ A\_27a)\ c\_2Enum\_2E0)\ V0l) = (ap\ ( \\ & c\_2Elist\_2EHD\ A\_27a)\ V0l))) \wedge (\forall V1l \in (ty\_2Elist\_2Elist \\ & A\_27a). (\forall V2n \in ty\_2Enum\_2Enum. ((ap\ (ap\ (c\_2Elist\_2EEL \\ & A\_27a)\ (ap\ c\_2Enum\_2ESUC\ V2n))\ V1l) = (ap\ (ap\ (c\_2Elist\_2EEL\ A\_27a) \\ & V2n)\ (ap\ (c\_2Elist\_2ETL\ A\_27a)\ V1l)))))) \end{aligned} \quad (99)$$

Assume the following.

$$\begin{aligned} & \forall A\_27a.nonempty\ A\_27a \Rightarrow (\forall V0l1 \in (ty\_2Elist\_2Elist \\ & A\_27a). (\forall V1l2 \in (ty\_2Elist\_2Elist\ A\_27a). ((ap\ (c\_2Elist\_2ELENGTH \\ & A\_27a)\ (ap\ (ap\ (c\_2Elist\_2EAPPEND\ A\_27a)\ V0l1)\ V1l2)) = (ap\ (ap\ c\_2Earithmetic\_2E\_2B \\ & (ap\ (c\_2Elist\_2ELENGTH\ A\_27a)\ V0l1))\ (ap\ (c\_2Elist\_2ELENGTH\ A\_27a) \\ & V1l2)))))) \end{aligned} \quad (100)$$

Assume the following.

$$\begin{aligned} \forall A\_27a.nonempty\ A\_27a \Rightarrow (\forall V0l \in (ty\_2Elist\_2Elist \\ A\_27a).(((ap\ (c\_2Elist\_2ELENGTH\ A\_27a)\ V0l) = c\_2Enum\_2E0) \Leftrightarrow ( \\ V0l = (c\_2Elist\_2ENIL\ A\_27a)))) \end{aligned} \quad (101)$$

Assume the following.

$$\begin{aligned} \forall A\_27a.nonempty\ A\_27a \Rightarrow \forall A\_27b.nonempty\ A\_27b \Rightarrow ( \\ \forall V0n \in ty\_2Enum\_2Enum. (\forall V1l \in A\_27b. (\forall V2ls \in \\ (ty\_2Elist\_2Elist\ A\_27b). (((ap\ (c\_2Elist\_2EEL\ A\_27a)\ c\_2Enum\_2E0) = \\ (c\_2Elist\_2EHD\ A\_27a)) \wedge ((ap\ (ap\ (c\_2Elist\_2EEL\ A\_27b)\ (ap\ c\_2Enum\_2ESUC \\ V0n))\ (ap\ (ap\ (c\_2Elist\_2ECONS\ A\_27b)\ V1l)\ V2ls)) = (ap\ (ap\ (c\_2Elist\_2EEL \\ A\_27b)\ V0n)\ V2ls)))))) \end{aligned} \quad (102)$$

Assume the following.

$$\begin{aligned} \forall A\_27a.nonempty\ A\_27a \Rightarrow (\forall V0f \in (A\_27a^{ty\_2Enum\_2Enum}). \\ (\forall V1n \in ty\_2Enum\_2Enum. ((ap\ (c\_2Elist\_2ELENGTH\ A\_27a) \\ (ap\ (ap\ (c\_2Elist\_2EGENLIST\ A\_27a)\ V0f)\ V1n)) = V1n))) \end{aligned} \quad (103)$$

Assume the following.

$$\begin{aligned} \forall A\_27a.nonempty\ A\_27a \Rightarrow (\forall V0f \in (A\_27a^{ty\_2Enum\_2Enum}). \\ (\forall V1n \in ty\_2Enum\_2Enum. (\forall V2x \in ty\_2Enum\_2Enum. ( \\ (p\ (ap\ (ap\ c\_2Eprim\_rec\_2E\_3C\ V2x)\ V1n)) \Rightarrow ((ap\ (ap\ (c\_2Elist\_2EEL \\ A\_27a)\ V2x)\ (ap\ (ap\ (c\_2Elist\_2EGENLIST\ A\_27a)\ V0f)\ V1n)) = (ap\ V0f \\ V2x)))))) \end{aligned} \quad (104)$$

Assume the following.

$$\begin{aligned} (((ap\ c\_2Enum\_2ESUC\ c\_2Earithmetic\_2EZERO) = (ap\ c\_2Earithmetic\_2EBIT1 \\ c\_2Earithmetic\_2EZERO)) \wedge ((\forall V0n \in ty\_2Enum\_2Enum. ((ap \\ c\_2Enum\_2ESUC\ (ap\ c\_2Earithmetic\_2EBIT1\ V0n)) = (ap\ c\_2Earithmetic\_2EBIT2 \\ V0n))) \wedge (\forall V1n \in ty\_2Enum\_2Enum. ((ap\ c\_2Enum\_2ESUC\ (ap\ c\_2Earithmetic\_2EBIT2 \\ V1n)) = (ap\ c\_2Earithmetic\_2EBIT1\ (ap\ c\_2Enum\_2ESUC\ V1n)))))) \end{aligned} \quad (105)$$



Assume the following.

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

Assume the following.

$$\begin{aligned}
& (\forall V0n \in ty\_2Enum\_2Enum. (\forall V1m \in ty\_2Enum\_2Enum. ( \\
& ((ap\ c\_2Enumeral\_2EiZ\ (ap\ (ap\ c\_2Earithmetic\_2E\_2B\ c\_2Earithmetic\_2EZERO) \\
& V0n)) = V0n) \wedge (((ap\ c\_2Enumeral\_2EiZ\ (ap\ (ap\ c\_2Earithmetic\_2E\_2B \\
& V0n)\ c\_2Earithmetic\_2EZERO)) = V0n) \wedge (((ap\ c\_2Enumeral\_2EiZ\ ( \\
& ap\ (ap\ c\_2Earithmetic\_2E\_2B\ (ap\ c\_2Earithmetic\_2EBIT1\ V0n))\ ( \\
& ap\ c\_2Earithmetic\_2EBIT1\ V1m))) = (ap\ c\_2Earithmetic\_2EBIT2\ ( \\
& ap\ c\_2Enumeral\_2EiZ\ (ap\ (ap\ c\_2Earithmetic\_2E\_2B\ V0n)\ V1m)))) \wedge \\
& (((ap\ c\_2Enumeral\_2EiZ\ (ap\ (ap\ c\_2Earithmetic\_2E\_2B\ (ap\ c\_2Earithmetic\_2EBIT1 \\
& V0n))\ (ap\ c\_2Earithmetic\_2EBIT2\ V1m))) = (ap\ c\_2Earithmetic\_2EBIT1 \\
& (ap\ c\_2Enum\_2ESUC\ (ap\ (ap\ c\_2Earithmetic\_2E\_2B\ V0n)\ V1m)))) \wedge ( \\
& ((ap\ c\_2Enumeral\_2EiZ\ (ap\ (ap\ c\_2Earithmetic\_2E\_2B\ (ap\ c\_2Earithmetic\_2EBIT2 \\
& V0n))\ (ap\ c\_2Earithmetic\_2EBIT1\ V1m))) = (ap\ c\_2Earithmetic\_2EBIT1 \\
& (ap\ c\_2Enum\_2ESUC\ (ap\ (ap\ c\_2Earithmetic\_2E\_2B\ V0n)\ V1m)))) \wedge ( \\
& ((ap\ c\_2Enumeral\_2EiZ\ (ap\ (ap\ c\_2Earithmetic\_2E\_2B\ (ap\ c\_2Earithmetic\_2EBIT2 \\
& V0n))\ (ap\ c\_2Earithmetic\_2EBIT2\ V1m))) = (ap\ c\_2Earithmetic\_2EBIT2 \\
& (ap\ c\_2Enum\_2ESUC\ (ap\ (ap\ c\_2Earithmetic\_2E\_2B\ V0n)\ V1m)))) \wedge ( \\
& ((ap\ c\_2Enum\_2ESUC\ (ap\ (ap\ c\_2Earithmetic\_2E\_2B\ c\_2Earithmetic\_2EZERO) \\
& V0n)) = (ap\ c\_2Enum\_2ESUC\ V0n)) \wedge (((ap\ c\_2Enum\_2ESUC\ (ap\ (ap\ c\_2Earithmetic\_2E\_2B \\
& V0n)\ c\_2Earithmetic\_2EZERO)) = (ap\ c\_2Enum\_2ESUC\ V0n)) \wedge (((ap \\
& c\_2Enum\_2ESUC\ (ap\ (ap\ c\_2Earithmetic\_2E\_2B\ (ap\ c\_2Earithmetic\_2EBIT1 \\
& V0n))\ (ap\ c\_2Earithmetic\_2EBIT1\ V1m))) = (ap\ c\_2Earithmetic\_2EBIT1 \\
& (ap\ c\_2Enum\_2ESUC\ (ap\ (ap\ c\_2Earithmetic\_2E\_2B\ V0n)\ V1m)))) \wedge ( \\
& ((ap\ c\_2Enum\_2ESUC\ (ap\ (ap\ c\_2Earithmetic\_2E\_2B\ (ap\ c\_2Earithmetic\_2EBIT1 \\
& V0n))\ (ap\ c\_2Earithmetic\_2EBIT2\ V1m))) = (ap\ c\_2Earithmetic\_2EBIT2 \\
& (ap\ c\_2Enum\_2ESUC\ (ap\ (ap\ c\_2Earithmetic\_2E\_2B\ V0n)\ V1m)))) \wedge ( \\
& ((ap\ c\_2Enum\_2ESUC\ (ap\ (ap\ c\_2Earithmetic\_2E\_2B\ (ap\ c\_2Earithmetic\_2EBIT2 \\
& V0n))\ (ap\ c\_2Earithmetic\_2EBIT1\ V1m))) = (ap\ c\_2Earithmetic\_2EBIT2 \\
& (ap\ c\_2Enum\_2ESUC\ (ap\ (ap\ c\_2Earithmetic\_2E\_2B\ V0n)\ V1m)))) \wedge ( \\
& ((ap\ c\_2Enum\_2ESUC\ (ap\ (ap\ c\_2Earithmetic\_2E\_2B\ (ap\ c\_2Earithmetic\_2EBIT2 \\
& V0n))\ (ap\ c\_2Earithmetic\_2EBIT2\ V1m))) = (ap\ c\_2Earithmetic\_2EBIT1 \\
& (ap\ c\_2Enumeral\_2EiiSUC\ (ap\ (ap\ c\_2Earithmetic\_2E\_2B\ V0n)\ V1m)))) \wedge \\
& (((ap\ c\_2Enumeral\_2EiiSUC\ (ap\ (ap\ c\_2Earithmetic\_2E\_2B\ c\_2Earithmetic\_2EZERO) \\
& V0n)) = (ap\ c\_2Enumeral\_2EiiSUC\ V0n)) \wedge (((ap\ c\_2Enumeral\_2EiiSUC \\
& (ap\ (ap\ c\_2Earithmetic\_2E\_2B\ V0n)\ c\_2Earithmetic\_2EZERO)) = ( \\
& ap\ c\_2Enumeral\_2EiiSUC\ V0n)) \wedge (((ap\ c\_2Enumeral\_2EiiSUC\ (ap\ ( \\
& ap\ c\_2Earithmetic\_2E\_2B\ (ap\ c\_2Earithmetic\_2EBIT1\ V0n))\ (ap\ c\_2Earithmetic\_2EBIT1 \\
& V1m))) = (ap\ c\_2Earithmetic\_2EBIT2\ (ap\ c\_2Enum\_2ESUC\ (ap\ (ap\ c\_2Earithmetic\_2E\_2B \\
& V0n)\ V1m)))) \wedge (((ap\ c\_2Enumeral\_2EiiSUC\ (ap\ (ap\ c\_2Earithmetic\_2E\_2B \\
& (ap\ c\_2Earithmetic\_2EBIT1\ V0n))\ (ap\ c\_2Earithmetic\_2EBIT2\ V1m))) = \\
& (ap\ c\_2Earithmetic\_2EBIT1\ (ap\ c\_2Enumeral\_2EiiSUC\ (ap\ (ap\ c\_2Earithmetic\_2E\_2B \\
& V0n)\ V1m)))) \wedge (((ap\ c\_2Enumeral\_2EiiSUC\ (ap\ (ap\ c\_2Earithmetic\_2E\_2B \\
& (ap\ c\_2Earithmetic\_2EBIT2\ V0n))\ (ap\ c\_2Earithmetic\_2EBIT1\ V1m))) = \\
& (ap\ c\_2Earithmetic\_2EBIT1\ (ap\ c\_2Enumeral\_2EiiSUC\ (ap\ (ap\ c\_2Earithmetic\_2E\_2B \\
& V0n)\ V1m)))) \wedge (((ap\ c\_2Enumeral\_2EiiSUC\ (ap\ (ap\ c\_2Earithmetic\_2E\_2B \\
& (ap\ c\_2Earithmetic\_2EBIT2\ V0n))\ (ap\ c\_2Earithmetic\_2EBIT2\ V1m))) = \\
& (ap\ c\_2Earithmetic\_2EBIT2\ (ap\ c\_2Enumeral\_2EiiSUC\ (ap\ (ap\ c\_2Earithmetic\_2E\_2B \\
& V0n)\ V1m))
\end{aligned}$$

Assume the following.

$$\begin{aligned}
& (\forall V0n \in ty\_2Enum\_2Enum. (\forall V1m \in ty\_2Enum\_2Enum. ( \\
& ((p (ap (ap c\_2Earithmetic\_2E\_3C\_3D c\_2Earithmetic\_2EZERO) V0n)) \Leftrightarrow \\
& True) \wedge (((p (ap (ap c\_2Earithmetic\_2E\_3C\_3D (ap c\_2Earithmetic\_2EBIT1 \\
& V0n)) c\_2Earithmetic\_2EZERO)) \Leftrightarrow False) \wedge (((p (ap (ap c\_2Earithmetic\_2E\_3C\_3D \\
& (ap c\_2Earithmetic\_2EBIT2 V0n)) c\_2Earithmetic\_2EZERO)) \Leftrightarrow False) \wedge \\
& (((p (ap (ap c\_2Earithmetic\_2E\_3C\_3D (ap c\_2Earithmetic\_2EBIT1 \\
& V0n)) (ap c\_2Earithmetic\_2EBIT1 V1m))) \Leftrightarrow (p (ap (ap c\_2Earithmetic\_2E\_3C\_3D \\
& V0n) V1m))) \wedge (((p (ap (ap c\_2Earithmetic\_2E\_3C\_3D (ap c\_2Earithmetic\_2EBIT1 \\
& V0n)) (ap c\_2Earithmetic\_2EBIT2 V1m))) \Leftrightarrow (p (ap (ap c\_2Earithmetic\_2E\_3C\_3D \\
& V0n) V1m))) \wedge (((p (ap (ap c\_2Earithmetic\_2E\_3C\_3D (ap c\_2Earithmetic\_2EBIT2 \\
& V0n)) (ap c\_2Earithmetic\_2EBIT1 V1m))) \Leftrightarrow (\neg (p (ap (ap c\_2Earithmetic\_2E\_3C\_3D \\
& V1m) V0n)))) \wedge (((p (ap (ap c\_2Earithmetic\_2E\_3C\_3D (ap c\_2Earithmetic\_2EBIT2 \\
& V0n)) (ap c\_2Earithmetic\_2EBIT2 V1m))) \Leftrightarrow (p (ap (ap c\_2Earithmetic\_2E\_3C\_3D \\
& V0n) V1m))))))))))
\end{aligned} \tag{108}$$

Assume the following.

$$(\forall V0n \in ty\_2Enum\_2Enum. (\neg (p (ap (ap c\_2Eprim\_rec\_2E\_3C V0n) c\_2Enum\_2E0)))) \tag{109}$$

Assume the following.

$$\begin{aligned}
& \forall A\_27a.nonempty A\_27a \Rightarrow (\forall V0n \in ty\_2Enum\_2Enum. ( \\
& \forall V1l1 \in (ty\_2Elist\_2Elist A\_27a). (\forall V2l2 \in (ty\_2Elist\_2Elist \\
& A\_27a). ((p (ap (ap c\_2Eprim\_rec\_2E\_3C V0n) (ap (c\_2Elist\_2ELENGTH \\
& A\_27a) V1l1))) \Rightarrow ((ap (ap (c\_2Elist\_2EEL A\_27a) V0n) (ap (ap (c\_2Elist\_2EAPPEND \\
& A\_27a) V1l1) V2l2)) = (ap (ap (c\_2Elist\_2EEL A\_27a) V0n) V1l1))))))
\end{aligned} \tag{110}$$

Assume the following.

$$\begin{aligned}
& \forall A\_27a.nonempty A\_27a \Rightarrow (\forall V0l1 \in (ty\_2Elist\_2Elist \\
& A\_27a). (\forall V1n \in ty\_2Enum\_2Enum. ((p (ap (ap c\_2Earithmetic\_2E\_3C\_3D \\
& (ap (c\_2Elist\_2ELENGTH A\_27a) V0l1)) V1n)) \Rightarrow (\forall V2l2 \in (ty\_2Elist\_2Elist \\
& A\_27a). ((ap (ap (c\_2Elist\_2EEL A\_27a) V1n) (ap (ap (c\_2Elist\_2EAPPEND \\
& A\_27a) V0l1) V2l2)) = (ap (ap (c\_2Elist\_2EEL A\_27a) (ap (ap c\_2Earithmetic\_2E\_2D \\
& V1n) (ap (c\_2Elist\_2ELENGTH A\_27a) V0l1))) V2l2))))))
\end{aligned} \tag{111}$$

Assume the following.

$$(\forall V0t \in 2. ((\neg(\neg(p V0t))) \Leftrightarrow (p V0t))) \tag{112}$$

Assume the following.

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

Assume the following.

$$\begin{aligned}
& (\forall V0A \in 2. (\forall V1B \in 2. (((\neg((p V0A) \vee (p V1B))) \Rightarrow False) \Leftrightarrow \\
& (((p V0A) \Rightarrow False) \Rightarrow ((\neg(p V1B)) \Rightarrow False))))))
\end{aligned} \tag{114}$$

Assume the following.

$$(\forall V0A \in 2.(\forall V1B \in 2.(((\neg(\neg(p V0A)) \vee (p V1B))) \Rightarrow False) \Leftrightarrow ((p V0A) \Rightarrow ((\neg(p V1B)) \Rightarrow False)))) \quad (115)$$

Assume the following.

$$(\forall V0A \in 2.(((\neg(p V0A)) \Rightarrow False) \Rightarrow (((p V0A) \Rightarrow False) \Rightarrow False))) \quad (116)$$

Assume the following.

$$(\forall V0p \in 2.(\forall V1q \in 2.(\forall V2r \in 2.(((p V0p) \Leftrightarrow (p V1q) \Leftrightarrow (p V2r)) \Leftrightarrow (((p V0p) \vee ((p V1q) \vee (p V2r))) \wedge (((p V0p) \vee ((\neg(p V2r)) \vee (\neg(p V1q)))) \wedge (((\neg(p V1q)) \vee (\neg(p V0p)))))))))) \quad (117)$$

Assume the following.

$$(\forall V0p \in 2.(\forall V1q \in 2.(\forall V2r \in 2.(((p V0p) \Leftrightarrow (p V1q) \wedge (p V2r)) \Leftrightarrow (((p V0p) \vee ((\neg(p V1q)) \vee (\neg(p V2r)))) \wedge (((p V1q) \vee (\neg(p V0p))) \wedge ((p V2r) \vee (\neg(p V0p)))))))) \quad (118)$$

Assume the following.

$$(\forall V0p \in 2.(\forall V1q \in 2.(\forall V2r \in 2.(((p V0p) \Leftrightarrow (p V1q) \vee (p V2r)) \Leftrightarrow (((p V0p) \vee (\neg(p V1q))) \wedge (((p V0p) \vee (\neg(p V2r))) \wedge ((p V1q) \vee ((p V2r) \vee (\neg(p V0p)))))))))) \quad (119)$$

Assume the following.

$$(\forall V0p \in 2.(\forall V1q \in 2.(((p V0p) \Leftrightarrow (\neg(p V1q))) \Leftrightarrow (((p V0p) \vee (p V1q)) \wedge ((\neg(p V1q)) \vee (\neg(p V0p)))))) \quad (120)$$

Assume the following.

$$\forall A.27a.nonempty A.27a \Rightarrow (ap (ap (ap c.2Eprim\_rec.2E\_3C c.2Enum.2E0) (ap (c.2Efc.2Edimindex A.27a) (c.2Ebool.2Ethe\_value A.27a)))) \quad (121)$$

Assume the following.

$$\forall A.27a.nonempty A.27a \Rightarrow (\forall V0m \in ty.2Enum.2Enum.(\forall V1n \in ty.2Enum.2Enum.(((ap (c.2Ewords.2En2w A.27a) V0m) = (ap (c.2Ewords.2En2w A.27a) V1n)) \Leftrightarrow ((ap (ap c.2Earithmetic.2EMOD V0m) (ap (c.2Ewords.2Edimword A.27a) (c.2Ebool.2Ethe\_value A.27a))) = (ap (ap c.2Earithmetic.2EMOD V1n) (ap (c.2Ewords.2Edimword A.27a) (c.2Ebool.2Ethe\_value A.27a))))))) \quad (122)$$

Assume the following.

$$\begin{aligned} \forall A.27a.nonempty\ A.27a \Rightarrow & ((ap\ (c.2Ewords.2Eword\_2comp \\ & A.27a)\ (ap\ (c.2Ewords.2En2w\ A.27a)\ (ap\ c.2Earithmetic.2ENUMERAL \\ & (ap\ c.2Earithmetic.2EBIT1\ c.2Earithmetic.2EZERO)))) = (c.2Ewords.2Eword\_T \\ & A.27a)) \end{aligned} \quad (123)$$

Assume the following.

$$\begin{aligned} \forall A.27a.nonempty\ A.27a \Rightarrow & (\forall V0i \in ty.2Enum.2Enum. ( \\ & (p\ (ap\ (ap\ c.2Eprim\_rec.2E.3C\ V0i)\ (ap\ (c.2Efc.2Edimindex\ A.27a) \\ & (c.2Ebool.2Ethe\_value\ A.27a)))) \Rightarrow (p\ (ap\ (ap\ (c.2Efc.2Efc\_index \\ & 2\ A.27a)\ (ap\ (c.2Ewords.2Eword\_2comp\ A.27a)\ (ap\ (c.2Ewords.2En2w \\ & A.27a)\ (ap\ c.2Earithmetic.2ENUMERAL\ (ap\ c.2Earithmetic.2EBIT1 \\ & c.2Earithmetic.2EZERO))))))\ V0i)))) \end{aligned} \quad (124)$$

Assume the following.

$$\begin{aligned} \forall A.27a.nonempty\ A.27a \Rightarrow & (\forall V0a \in (ty.2Efc.2Ecart \\ & 2\ A.27a). (\forall V1b \in (ty.2Efc.2Ecart\ 2\ A.27a). ((ap\ (ap\ (c.2Ewords.2Eword\_or \\ & A.27a)\ V0a)\ V1b) = (ap\ (ap\ (c.2Ewords.2Eword\_or\ A.27a)\ V1b)\ V0a)))) \end{aligned} \quad (125)$$

Assume the following.

$$\begin{aligned} \forall A.27a.nonempty\ A.27a \Rightarrow & (\forall V0w \in (ty.2Efc.2Ecart \\ & 2\ A.27a). (\forall V1b \in ty.2Enum.2Enum. ((p\ (ap\ (ap\ c.2Eprim\_rec.2E.3C \\ & V1b)\ (ap\ (c.2Efc.2Edimindex\ A.27a)\ (c.2Ebool.2Ethe\_value\ A.27a)))) \Rightarrow \\ & ((p\ (ap\ (ap\ (c.2Efc.2Efc\_index\ 2\ A.27a)\ V0w)\ V1b)) \Leftrightarrow (p\ (ap\ (ap \\ & (c.2Ewords.2Eword\_bit\ A.27a)\ V1b)\ V0w)))))) \end{aligned} \quad (126)$$

Assume the following.

$$\begin{aligned} \forall A.27a.nonempty\ A.27a \Rightarrow & (\forall V0w \in (ty.2Efc.2Ecart \\ & 2\ A.27a). (\forall V1n \in ty.2Enum.2Enum. ((p\ (ap\ (ap\ c.2Earithmetic.2E.3C.3D \\ & (ap\ (c.2Efc.2Edimindex\ A.27a)\ (c.2Ebool.2Ethe\_value\ A.27a))) \\ & V1n)) \Rightarrow ((ap\ (ap\ (c.2Ewords.2Eword\_asr\ A.27a)\ V0w)\ V1n) = (ap\ (ap \\ & (ap\ (c.2Ebool.2ECOND\ (ty.2Efc.2Ecart\ 2\ A.27a)\ (ap\ (c.2Ewords.2Eword\_msb \\ & A.27a)\ V0w))\ (c.2Ewords.2Eword\_T\ A.27a)\ (ap\ (c.2Ewords.2En2w \\ & A.27a)\ c.2Enum.2E0)))))) \end{aligned} \quad (127)$$

Assume the following.

$$\begin{aligned}
& \forall A\_27a.nonempty\ A\_27a \Rightarrow (\forall V0w \in (ty\_2Efc\_2Ecart \\
& \quad 2\ A\_27a). (\forall V1n \in ty\_2Enum\_2Enum. ((ap\ (ap\ (c\_2Ewords\_2Eword\_asr \\
& \quad A\_27a)\ V0w)\ V1n) = (ap\ (ap\ (ap\ (c\_2Ebool\_2ECOND\ (ty\_2Efc\_2Ecart \\
& \quad 2\ A\_27a))\ (ap\ (c\_2Ewords\_2Eword\_msb\ A\_27a)\ V0w))\ (ap\ (ap\ (c\_2Ewords\_2Eword\_or \\
& \quad A\_27a)\ (ap\ (ap\ (ap\ (c\_2Ewords\_2Eword\_slice\ A\_27a)\ (ap\ (ap\ c\_2Earithmetic\_2E\_2D \\
& \quad (ap\ (c\_2Efc\_2Edimindex\ A\_27a)\ (c\_2Ebool\_2Ethe\_value\ A\_27a)))) \\
& \quad (ap\ c\_2Earithmetic\_2ENUMERAL\ (ap\ c\_2Earithmetic\_2EBIT1\ c\_2Earithmetic\_2EZERO)))) \\
& \quad (ap\ (ap\ c\_2Earithmetic\_2E\_2D\ (ap\ (c\_2Efc\_2Edimindex\ A\_27a)\ ( \\
& \quad c\_2Ebool\_2Ethe\_value\ A\_27a)))\ V1n))\ (c\_2Ewords\_2Eword\_T\ A\_27a))) \\
& \quad (ap\ (ap\ (c\_2Ewords\_2Eword\_lsr\ A\_27a)\ V0w)\ V1n)))\ (ap\ (ap\ (c\_2Ewords\_2Eword\_lsr \\
& \quad A\_27a)\ V0w)\ V1n))))))
\end{aligned} \tag{128}$$

Assume the following.

$$\begin{aligned}
& \forall A\_27a.nonempty\ A\_27a \Rightarrow (\forall V0h \in ty\_2Enum\_2Enum. ( \\
& \quad \neg(p\ (ap\ (ap\ (c\_2Ewords\_2Eword\_bit\ A\_27a)\ V0h)\ (ap\ (c\_2Ewords\_2Een2w \\
& \quad A\_27a)\ c\_2Enum\_2E0))))))
\end{aligned} \tag{129}$$

### Theorem 1

$$\begin{aligned}
& \forall A\_27a.nonempty\ A\_27a \Rightarrow (\forall V0n \in ty\_2Enum\_2Enum. ( \\
& \quad \forall V1v \in (ty\_2Elist\_2Elist\ 2). ((ap\ (ap\ (c\_2Ewords\_2Eword\_asr \\
& \quad A\_27a)\ (ap\ (c\_2Ebitstring\_2Ev2w\ A\_27a)\ V1v))\ V0n) = (ap\ (ap\ (c\_2Ebool\_2ELET \\
& \quad (ty\_2Elist\_2Elist\ 2)\ (ty\_2Efc\_2Ecart\ 2\ A\_27a))\ (\lambda V2l \in ( \\
& \quad ty\_2Elist\_2Elist\ 2). (ap\ (c\_2Ebitstring\_2Ev2w\ A\_27a)\ (ap\ (ap \\
& \quad (c\_2Ebitstring\_2Esign\_extend\ 2)\ (ap\ (c\_2Efc\_2Edimindex\ A\_27a) \\
& \quad (c\_2Ebool\_2Ethe\_value\ A\_27a)))\ (ap\ (ap\ (ap\ (c\_2Ebool\_2ECOND \\
& \quad (ty\_2Elist\_2Elist\ 2))\ (ap\ (ap\ c\_2Earithmetic\_2E\_3C\_3D\ (ap\ (c\_2Efc\_2Edimindex \\
& \quad A\_27a)\ (c\_2Ebool\_2Ethe\_value\ A\_27a)))\ V0n))\ (ap\ (ap\ (c\_2Elist\_2ECONS \\
& \quad 2)\ (ap\ (c\_2Elist\_2EHD\ 2)\ V2l))\ (c\_2Elist\_2ENIL\ 2)))\ (ap\ (ap\ c\_2Ebitstring\_2Eshiftr \\
& \quad V2l)\ V0n))))))\ (ap\ (ap\ c\_2Ebitstring\_2Efixwidth\ (ap\ (c\_2Efc\_2Edimindex \\
& \quad A\_27a)\ (c\_2Ebool\_2Ethe\_value\ A\_27a)))\ V1v))))))
\end{aligned}$$