

thm_2Ebinary_ieee_2Ediff_lt_ulp_eq0
 (TMahdjjb1Fevc5nxNbUVx5Ur3hhCLhrvMmQ)

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Definition 1 We define $c_2Emin_2E_3D$ to be $\lambda A. \lambda x \in A. \lambda y \in A. inj_o (x = y)$ of type $\iota \Rightarrow \iota$.

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

Definition 3 We define $c_2Ebool_2E_21$ to be $\lambda A_27a : \iota. (\lambda V0P \in (2^{A_27a}). (ap (ap (c_2Emin_2E_3D (2^{A_27a})) (\lambda V1P \in 2.V1P)) (\lambda V2P \in 2.V2P)))$

Definition 4 We define c_2Ebool_2EF to be $(ap (c_2Ebool_2E_21 2) (\lambda V0t \in 2.V0t))$.

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

$$c_2Enum_2EZERO_REP \in \omega \quad (1)$$

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

$$nonempty\ ty_2Enum_2Enum \quad (2)$$

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

$$c_2Enum_2EABS_num \in (ty_2Enum_2Enum^\omega) \quad (3)$$

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

Let $ty_2Erealax_2Ereal : \iota$ be given. Assume the following.

$$nonempty\ ty_2Erealax_2Ereal \quad (4)$$

Let $c_2Ereal_2Ereal_of_num : \iota$ be given. Assume the following.

$$c_2Ereal_2Ereal_of_num \in (ty_2Erealax_2Ereal^{ty_2Enum_2Enum}) \quad (5)$$

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

$$\forall A0. nonempty\ A0 \Rightarrow nonempty\ (ty_2Ebool_2Eitself\ A0) \quad (6)$$

Let $c_2Ebool_2Ethethe_value : \iota \Rightarrow \iota$ be given. Assume the following.

$$\begin{aligned} \forall A_27a. & nonempty\ A_27a \Rightarrow c_2Ebool_2Ethethe_value\ A_27a \in \\ & ty_2Ebool_2Eitself\ A_27a \end{aligned} \quad (7)$$

Let $c_2Efcp_2Edimindex : \iota \Rightarrow \iota$ be given. Assume the following.

$$\forall A_27a.\text{nonempty } A_27a \Rightarrow c_2Efcp_2Edimindex A_27a \in (\text{ty_2Enum_2Enum}^{(ty_2Ebool_2Eitself A_27a)}) \quad (8)$$

Definition 6 We define $c_2Earithmetic_2EZERO$ to be c_2Enum_2E0 .

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

$$c_2Enum_2EREP_num \in (\omega^{ty_2Enum_2Enum}) \quad (9)$$

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

$$c_2Enum_2ESUC_REP \in (\omega^{\omega}) \quad (10)$$

Definition 7 We define c_2Enum_2ESUC to be $\lambda V0m \in \text{ty_2Enum_2Enum}.(\text{ap } c_2Enum_2EABS_num m)$

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

$$c_2Earithmetic_2E_2B \in ((\text{ty_2Enum_2Enum}^{ty_2Enum_2Enum})^{ty_2Enum_2Enum}) \quad (11)$$

Definition 8 We define $c_2Earithmetic_2EBIT2$ to be $\lambda V0n \in \text{ty_2Enum_2Enum}.(\text{ap } (\text{ap } c_2Earithmetic_2E_2B n))$

Definition 9 We define $c_2Earithmetic_2ENUMERAL$ to be $\lambda V0x \in \text{ty_2Enum_2Enum}.V0x$.

Let $c_2Ereal_2Epow : \iota$ be given. Assume the following.

$$c_2Ereal_2Epow \in ((\text{ty_2Erealax_2Ereal}^{ty_2Enum_2Enum})^{ty_2Erealax_2Ereal}) \quad (12)$$

Let $ty_2Efcp_2Ecart : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Assume the following.

$$\begin{aligned} \forall A0.\text{nonempty } A0 \Rightarrow & \forall A1.\text{nonempty } A1 \Rightarrow \text{nonempty } (ty_2Efcp_2Ecart \\ & A0 A1) \end{aligned} \quad (13)$$

Let $ty_2Ebinary_ieee_2Efloat : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Assume the following.

$$\begin{aligned} \forall A0.\text{nonempty } A0 \Rightarrow & \forall A1.\text{nonempty } A1 \Rightarrow \text{nonempty } (ty_2Ebinary_ieee_2Efloat \\ & A0 A1) \end{aligned} \quad (14)$$

Let $c_2Ebinary_ieee_2Efloat_Significand : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Assume the following.

$$\begin{aligned} \forall A_27t.\text{nonempty } A_27t \Rightarrow & \forall A_27w.\text{nonempty } A_27w \Rightarrow c_2Ebinary_ieee_2Efloat_Significand \\ & A_27t A_27w \in ((ty_2Efcp_2Ecart 2 A_27t)^{(ty_2Ebinary_ieee_2Efloat A_27t A_27w)}) \end{aligned} \quad (15)$$

Let $ty_2Efcp_2Efinite_image : \iota \Rightarrow \iota$ be given. Assume the following.

$$\forall A0.\text{nonempty } A0 \Rightarrow \text{nonempty } (ty_2Efcp_2Efinite_image A0) \quad (16)$$

Definition 10 We define $c_{\text{min_3D_3D_3E}}$ to be $\lambda P \in 2.\lambda Q \in 2.\text{inj_o} (p \Rightarrow p Q)$ of type ι .

Definition 11 We define $c_2Ebool_2E_7E$ to be $(\lambda V0t \in 2.(ap\ (ap\ c_2Emin_2E_3D_3D_3E\ V0t)\ c_2Ebool_2E))$

Definition 12 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 13 We define $c_2Emin_2E_40$ to be $\lambda A.\lambda P \in 2^A.\text{if } (\exists x \in A.p \text{ (ap } P \text{ } x)) \text{ then } (\lambda x.x \in A \wedge$ of type $\iota \Rightarrow \iota$.

Definition 14 We define $c_2\text{Ebool_2E_3F}$ to be $\lambda A.\lambda 27a:\iota.(\lambda V0P \in (2^{A \cdot 27a}).(ap\;V0P\;(ap\;(c_2\text{Emin_2E_40}))$

Definition 15 We define $c_2Eprim_rec_2E_3C$ to be $\lambda V0m \in ty_2Enum_2Enum.\lambda V1n \in ty_2Enum_2Enum.$

Definition 16 We define $c_{\text{CBool}} : \lambda A.27a : \iota.(\lambda V0P \in (2^{A-27a}).(ap\ (ap\ c_{\text{CBool}}_2E_2F_25C\ P\ V0)\ P))$

Definition 17 We define $c_2Efcp_2Efinite_index$ to be $\lambda A_27a : \iota.(ap (c_2Emin_2E_40 (A_27a^{ty_2Enum_2Enu}))$

Let $c_2Efcp_2Edest_cart : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Assume the following.

$$\forall A_27a.\text{nonempty } A_27a \Rightarrow \forall A_27b.\text{nonempty } A_27b \Rightarrow c_2Efc_2Edest_cart A_27a A_27b \in ((A_27a(ty_2Efc_2Efinit_image A_27b))^{(ty_2Efc_2Ecart A_27a A_27b)}) \quad (17)$$

Definition 18 We define $c_2Efcp_2Efcp_index$ to be $\lambda A_27a : \iota.\lambda A_27b : \iota.\lambda V0x \in (ty_2Efcp_2Ecart\ A_27b)$

Let $c_2 \in \text{arithmic_EXP} : \iota$ be given. Assume the following.

$$c_2Earithmetic_2EEXP \in ((ty_2Enum_2Enum^{ty_2Enum_2Enum})ty_2Enum_2Enum) \quad (18)$$

Definition 20 We define c_2EBit_2ESBIT to be $\lambda V0b \in 2.\lambda V1n \in ty_2Enum_2Enum.(ap\ ap\ (ap\ (ap\ (c_2EBit\$

Let $c_2Esum_num_2ESUM : \iota$ be given. Assume the following.

$$c_2Esum_num_2ESUM \in ((ty_2Enum_2Enum^{(ty_2Enum_2Enum^{ty_2Enum^{ty_2Enum_2Enum}})})ty_2Enum_2Enum) \\ (19)$$

Definition 21 We define $c_2Ewords_2Ew2n$ to be $\lambda A_27a : \iota.\lambda V0w \in (ty_2Efcp_2Ecart\ 2\ A_27a).(ap\ (ap\ c\ w)\ V0)$

Let $ty_2Ehreal_2Ehreal : \iota$ be given. Assume the following.

nonempty *ty_2Ehreal_2Ehreal* (20)

Let $ty_2Epair_2Eprod : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Assume the following.

$$\forall A0.\text{nonempty } A0 \Rightarrow \forall A1.\text{nonempty } A1 \Rightarrow \text{nonempty}(\text{ty_2Epair_2Eprod } A0\ A1) \quad (21)$$

Let $c_2Erealax_2Ereal_REP_CLASS : \iota$ be given. Assume the following.

$$c_2Erealax_2Ereal_REP_CLASS \in ((2^{(ty_2Epair_2Eprod\ ty_2Ehreal_2Ehreal\ ty_2Ehreal_2Ehreal)})\ ty_2Erealax) \\ (22)$$

Definition 22 We define $c_2Erealax_2Ereal_REP$ to be $\lambda V0a \in ty_2Erealax_2Ereal.(ap (c_2Emin_2E_40 (t$

Let $c_2Erealax_2Etreal_inv : \iota$ be given. Assume the following.

$$c_2Erealax_2Etreal_inv \in ((ty_2Epair_2Eprod ty_2Ehreal_2Ehreal \\ ty_2Ehreal_2Ehreal)^{(ty_2Epair_2Eprod ty_2Ehreal_2Ehreal ty_2Ehreal_2Ehreal)}) \\ (23)$$

Let $c_2Erealax_2Etreal_eq : \iota$ be given. Assume the following.

$$c_2Erealax_2Etreal_eq \in ((2^{(ty_2Epair_2Eprod ty_2Ehreal_2Ehreal ty_2Ehreal_2Ehreal)})^{(ty_2Epair_2Eprod ty_2Ehreal_2Ehreal)}) \\ (24)$$

Let $c_2Erealax_2Ereal_ABS_CLASS : \iota$ be given. Assume the following.

$$c_2Erealax_2Ereal_ABS_CLASS \in (ty_2Erealax_2Ereal)^{2^{(ty_2Epair_2Eprod ty_2Ehreal_2Ehreal ty_2Ehreal_2Ehreal)}} \\ (25)$$

Definition 23 We define $c_2Erealax_2Ereal_ABS$ to be $\lambda V0r \in (ty_2Epair_2Eprod ty_2Ehreal_2Ehreal ty_2Ehreal_2Ehreal)$

Definition 24 We define $c_2Erealax_2Einr$ to be $\lambda V0T1 \in ty_2Erealax_2Ereal.(ap c_2Erealax_2Ereal_ABS$

Let $c_2Erealax_2Etreal_mul : \iota$ be given. Assume the following.

$$c_2Erealax_2Etreal_mul \in (((ty_2Epair_2Eprod ty_2Ehreal_2Ehreal \\ ty_2Ehreal_2Ehreal)^{(ty_2Epair_2Eprod ty_2Ehreal_2Ehreal ty_2Ehreal_2Ehreal)})^{(ty_2Epair_2Eprod ty_2Ehreal_2Ehreal ty_2Ehreal_2Ehreal)}) \\ (26)$$

Definition 25 We define $c_2Erealax_2Ereal_mul$ to be $\lambda V0T1 \in ty_2Erealax_2Ereal.\lambda V1T2 \in ty_2Erealax_2Ereal.(ap c_2Erealax_2Einr T1 T2)$

Definition 26 We define $c_2Ereal_2E_2F$ to be $\lambda V0x \in ty_2Erealax_2Ereal.\lambda V1y \in ty_2Erealax_2Ereal.(ap c_2Erealax_2Ereal_ABS$

Definition 27 We define $c_2Earithmetic_2EBIT1$ to be $\lambda V0n \in ty_2Enum_2Enum.(ap (ap c_2Earithmetic$

Let $c_2Erealax_2Etreal_add : \iota$ be given. Assume the following.

$$c_2Erealax_2Etreal_add \in (((ty_2Epair_2Eprod ty_2Ehreal_2Ehreal \\ ty_2Ehreal_2Ehreal)^{(ty_2Epair_2Eprod ty_2Ehreal_2Ehreal ty_2Ehreal_2Ehreal)})^{(ty_2Epair_2Eprod ty_2Ehreal_2Ehreal ty_2Ehreal_2Ehreal)}) \\ (27)$$

Definition 28 We define $c_2Erealax_2Ereal_add$ to be $\lambda V0T1 \in ty_2Erealax_2Ereal.\lambda V1T2 \in ty_2Erealax_2Ereal.(ap c_2Erealax_2Etreal_add T1 T2)$

Let $c_2Ewords_2EINT_MAX : \iota \Rightarrow \iota$ be given. Assume the following.

$$\forall A_27a.\text{nonempty } A_27a \Rightarrow c_2Ewords_2EINT_MAX A_27a \in (ty_2Enum_2Enum)^{(ty_2Ebool_2Eitself A_27a)} \\ (28)$$

Let $c_2Ebinary_ieee_2Efloat_Exponent : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Assume the following.

$$\forall A_27t.\text{nonempty } A_27t \Rightarrow \forall A_27w.\text{nonempty } A_27w \Rightarrow c_2Ebinary_ieee_2Efloat_Exponent A_27t A_27w \in ((ty_2Efcp_2Ecart 2 A_27w)^{(ty_2Ebinary_ieee_2Efloat A_27t A_27w)}) \\ (29)$$

Let $ty_2Eone_2Eone : \iota$ be given. Assume the following.

$$nonempty\ ty_2Eone_2Eone \quad (30)$$

Let $c_2Ebinary_ieee_2Efloat_Sign : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Assume the following.

$$\begin{aligned} & \forall A_27t. nonempty\ A_27t \Rightarrow \forall A_27w. nonempty\ A_27w \Rightarrow c_2Ebinary_ieee_2Efloat_Sign \\ & A_27t\ A_27w \in ((ty_2Efcp_2Ecart\ 2\ ty_2Eone_2Eone)^{(ty_2Ebinary_ieee_2Efloat\ A_27t\ A_27w)}) \end{aligned} \quad (31)$$

Let $c_2Erealax_2Etreal_neg : \iota$ be given. Assume the following.

$$\begin{aligned} & c_2Erealax_2Etreal_neg \in ((ty_2Epair_2Eprod\ ty_2Ehreal_2Ehreal \\ & ty_2Ehreal_2Ehreal)^{(ty_2Epair_2Eprod\ ty_2Ehreal_2Ehreal\ ty_2Ehreal_2Ehreal)}) \end{aligned} \quad (32)$$

Definition 29 We define $c_2Erealax_2Ereal_neg$ to be $\lambda V0T1 \in ty_2Erealax_2Ereal.(ap\ c_2Erealax_2Ereal$

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

$$c_2Earithmetic_2EDIV \in ((ty_2Enum_2Enum^{ty_2Enum_2Enum})^{ty_2Enum_2Enum}) \quad (33)$$

Definition 30 We define $c_2Ebit_2EDIV_2EXP$ to be $\lambda V0x \in ty_2Enum_2Enum.\lambda V1n \in ty_2Enum_2Enum$

Let $c_2Earithmetic_2E_2D : \iota$ be given. Assume the following.

$$c_2Earithmetic_2E_2D \in ((ty_2Enum_2Enum^{ty_2Enum_2Enum})^{ty_2Enum_2Enum}) \quad (34)$$

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

$$c_2Earithmetic_2EMOD \in ((ty_2Enum_2Enum^{ty_2Enum_2Enum})^{ty_2Enum_2Enum}) \quad (35)$$

Definition 31 We define $c_2Ebit_2EMOD_2EXP$ to be $\lambda V0x \in ty_2Enum_2Enum.\lambda V1n \in ty_2Enum_2Enum$

Definition 32 We define c_2Ebit_2EBITS to be $\lambda V0h \in ty_2Enum_2Enum.\lambda V1l \in ty_2Enum_2Enum.\lambda V2m \in ty_2Enum_2Enum$

Definition 33 We define c_2Ebit_2EBIT to be $\lambda V0b \in ty_2Enum_2Enum.\lambda V1n \in ty_2Enum_2Enum.(ap\ c_2Ebit_2EBITS\ V0b)$

Definition 34 We define c_2Efcp_2EFCP to be $\lambda A_27a : \iota.\lambda A_27b : \iota.(\lambda V0g \in (A_27a^{ty_2Enum_2Enum}).(ap\ c_2Efcp_2EFCB\ g\ A_27a))$

Definition 35 We define $c_2Ewords_2En2w$ to be $\lambda A_27a : \iota.\lambda V0n \in ty_2Enum_2Enum.(ap\ (c_2Efcp_2EFCB\ A_27a)\ V0n)$

Definition 36 We define $c_2Ebinary_ieee_2Efloat_to_real$ to be $\lambda A_27t : \iota.\lambda A_27w : \iota.\lambda V0x \in (ty_2Ebinary_ieee_2Efloat_Sign\ A_27t\ A_27w).(\lambda V1y \in ty_2Erealax_2Etreal_neg\ V0x\ V1y)$

Let $ty_2Ebinary_ieee_2Efloat_value : \iota$ be given. Assume the following.

$$nonempty\ ty_2Ebinary_ieee_2Efloat_value \quad (36)$$

Let $c_2Ebinary_ieee_2EFloat : \iota$ be given. Assume the following.

$$c_2Ebinary_ieee_2EFloat \in (ty_2Ebinary_ieee_2Efloat_value^{ty_2Erealax_2Ereal}) \quad (37)$$

Let $c_2Ebinary_ieee_2ENaN : \iota$ be given. Assume the following.

$$c_2Ebinary_ieee_2ENaN \in ty_2Ebinary_ieee_2Efloat_value \quad (38)$$

Let $c_2Ebinary_ieee_2EInfinity : \iota$ be given. Assume the following.

$$c_2Ebinary_ieee_2EInfinity \in ty_2Ebinary_ieee_2Efloat_value \quad (39)$$

Let $c_2Ewords_2EUINT_MAX : \iota \Rightarrow \iota$ be given. Assume the following.

$$\forall A_{27a}.nonempty\ A_{27a} \Rightarrow c_2Ewords_2EUINT_MAX\ A_{27a} \in (ty_2Enum_2Enum^{(ty_2Ebool_2Eitself\ A_{27a})}) \quad (40)$$

Definition 37 We define $c_2Ewords_2Eword_T$ to be $\lambda A_{27a} : \iota.(ap\ (c_2Ewords_2En2w\ A_{27a})\ (ap\ (c_2Ew$

Definition 38 We define $c_2Ebinary_ieee_2Efloat_value$ to be $\lambda A_{27t} : \iota.\lambda A_{27w} : \iota.\lambda V0x \in (ty_2Ebinary_$

Let $c_2Ebinary_ieee_2Efloat_value_CASE : \iota \Rightarrow \iota$ be given. Assume the following.

$$\begin{aligned} & \forall A_{27a}.nonempty\ A_{27a} \Rightarrow c_2Ebinary_ieee_2Efloat_value_CASE \\ & A_{27a} \in (((((A_{27a}^{A_{27a}})^{A_{27a}})^{(A_{27a}^{ty_2Erealax_2Ereal})})^{ty_2Ebinary_ieee_2Efloat_value}) \end{aligned} \quad (41)$$

Definition 39 We define $c_2Ebinary_ieee_2Efloat_is_zero$ to be $\lambda A_{27t} : \iota.\lambda A_{27w} : \iota.\lambda V0x \in (ty_2Ebina$

Let $c_2Epair_2EABS_prod : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Assume the following.

$$\begin{aligned} & \forall A_{27a}.nonempty\ A_{27a} \Rightarrow \forall A_{27b}.nonempty\ A_{27b} \Rightarrow c_2Epair_2EABS_prod \\ & A_{27a}\ A_{27b} \in ((ty_2Epair_2Eprod\ A_{27a}\ A_{27b})^{((2^{A_{27b}})^{A_{27a}})}) \end{aligned} \quad (42)$$

Definition 40 We define $c_2Epair_2E_2C$ to be $\lambda A_{27a} : \iota.\lambda A_{27b} : \iota.\lambda V0x \in A_{27a}.\lambda V1y \in A_{27b}.(ap\ (c_2$

Definition 41 We define $c_2Ecombin_2EK$ to be $\lambda A_{27a} : \iota.\lambda A_{27b} : \iota.(\lambda V0x \in A_{27a}.(\lambda V1y \in A_{27b}.V0x \in$

Definition 42 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 43 We define $c_2Ecombin_2EI$ to be $\lambda A_{27a} : \iota.(ap\ (ap\ (c_2Ecombin_2ES\ A_{27a}\ (A_{27a}^{A_{27b}})\ A_{27b}))$

Let $c_2Epair_2ESND : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Assume the following.

$$\begin{aligned} & \forall A_{27a}.nonempty\ A_{27a} \Rightarrow \forall A_{27b}.nonempty\ A_{27b} \Rightarrow c_2Epair_2ESND \\ & A_{27a}\ A_{27b} \in (A_{27b}^{(ty_2Epair_2Eprod\ A_{27a}\ A_{27b})}) \end{aligned} \quad (43)$$

Let $c_2Epair_2EFST : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Assume the following.

$$\begin{aligned} & \forall A_{27a}.nonempty\ A_{27a} \Rightarrow \forall A_{27b}.nonempty\ A_{27b} \Rightarrow c_2Epair_2EFST \\ & A_{27a}\ A_{27b} \in (A_{27a}^{(ty_2Epair_2Eprod\ A_{27a}\ A_{27b})}) \end{aligned} \quad (44)$$

Definition 44 We define $c_2Epair_2Epair_CASE$ to be $\lambda A_27a : \iota. \lambda A_27b : \iota. \lambda A_27c : \iota. \lambda V0p \in (ty_2Epair_2Epair_CASE)$

Definition 45 We define $c_2Erelation_2EWF$ to be $\lambda A_27a : \iota. \lambda V0R \in ((2^{A_27a})^{A_27a}).(ap (c_2Ebool_2E_21))$

Let $c_2Ebool_2EARB : \iota \Rightarrow \iota$ be given. Assume the following.

$$\forall A_27a. nonempty A_27a \Rightarrow c_2Ebool_2EARB A_27a \in A_27a \quad (45)$$

Definition 46 We define $c_2Erelation_2EREstrict$ to be $\lambda A_27a : \iota. \lambda A_27b : \iota. \lambda V0f \in (A_27b^{A_27a}).\lambda V1f$

Definition 47 We define $c_2Erelation_2ETC$ to be $\lambda A_27a : \iota. \lambda V0R \in ((2^{A_27a})^{A_27a}).\lambda V1a \in A_27a.\lambda V2b$

Definition 48 We define $c_2Erelation_2Eapprox$ to be $\lambda A_27a : \iota. \lambda A_27b : \iota. \lambda V0R \in ((2^{A_27a})^{A_27a}).\lambda V1M$

Definition 49 We define $c_2Erelation_2Ethe_fun$ to be $\lambda A_27a : \iota. \lambda A_27b : \iota. \lambda V0R \in ((2^{A_27a})^{A_27a}).\lambda V1M$

Definition 50 We define $c_2Erelation_2EWFREC$ to be $\lambda A_27a : \iota. \lambda A_27b : \iota. \lambda V0R \in ((2^{A_27a})^{A_27a}).\lambda V1M$

Definition 51 We define $c_2Ebinary_ieee_2EULP$ to be $\lambda A_27t : \iota. \lambda A_27w : \iota. (ap (ap (c_2Erelation_2EWFREC)))$

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

$$\forall A_27a. nonempty A_27a \Rightarrow c_2Ewords_2Edimword A_27a \in (ty_2Enum_2Enum^{(ty_2Ebool_2Eitself A_27a)}) \quad (46)$$

Definition 52 We define $c_2Ewords_2Eword_2comp$ to be $\lambda A_27a : \iota. \lambda V0w \in (ty_2Efcp_2Ecart 2 A_27a)$

Definition 53 We define $c_2Ebinary_ieee_2Exponent_boundary$ to be $\lambda A_27t : \iota. \lambda A_27w : \iota. \lambda V0y \in (ty_2Efcp_2Ecart 2 A_27t)$

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

$$c_2Earithmetic_2EEVEN \in (2^{ty_2Enum_2Enum}) \quad (47)$$

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

$$c_2Earithmetic_2EODD \in (2^{ty_2Enum_2Enum}) \quad (48)$$

Definition 54 We define $c_2Earithmetic_2E_3E$ to be $\lambda V0m \in ty_2Enum_2Enum. \lambda V1n \in ty_2Enum_2Enum. (ap (ap (c_2Earithmetic_2EEVEN)))$

Definition 55 We define $c_2Ebool_2E_5C_2F$ to be $(\lambda V0t1 \in 2. (\lambda V1t2 \in 2. (ap (c_2Ebool_2E_21 2) (\lambda V2t \in 2. (ap (ap (c_2Earithmetic_2EODD)))$

Definition 56 We define $c_2Earithmetic_2E_3E_3D$ to be $\lambda V0m \in ty_2Enum_2Enum. \lambda V1n \in ty_2Enum_2Enum. (ap (ap (c_2Earithmetic_2E_3E)))$

Definition 57 We define $c_2Eprim_rec_2EPRE$ to be $\lambda V0m \in ty_2Enum_2Enum. (ap (ap (ap (c_2Ebool_2E_21 2) (\lambda V1n \in ty_2Enum_2Enum. (ap (ap (c_2Earithmetic_2E_3E)))$

Definition 58 We define $c_2Enumeral_2EiiSUC$ to be $\lambda V0n \in ty_2Enum_2Enum. (ap c_2Enum_2ESUC (ap (ap (c_2Ebool_2E_21 2) (\lambda V1n \in ty_2Enum_2Enum. (ap (ap (c_2Earithmetic_2E_3E)))$

Definition 59 We define $c_2Enumeral_2EiDUB$ to be $\lambda V0x \in ty_2Enum_2Enum. (ap (ap (c_2Ebool_2E_21 2) (\lambda V1x \in ty_2Enum_2Enum. (ap (ap (c_2Earithmetic_2E_3E)))$

Definition 60 We define $c_2E\text{Enumeral_2EiZ}$ to be $\lambda V0x \in ty_2E\text{Enum_2Enum}.V0x$.

Definition 61 We define $c_2E\text{real_2Ereal_sub}$ to be $\lambda V0x \in ty_2E\text{realax_2Ereal}.\lambda V1y \in ty_2E\text{realax_2Ereal}.V1y$.

Let $c_2E\text{realax_2Etreal_lt} : \iota$ be given. Assume the following.

$$c_2E\text{realax_2Etreal_lt} \in ((2^{(ty_2E\text{pair_2Eprod} \ ty_2E\text{hreal_2Ehreal} \ ty_2E\text{hreal_2Ehreal})})(ty_2E\text{pair_2Eprod} \ ty_2E\text{hreal_2Ehreal})) \quad (49)$$

Definition 62 We define $c_2E\text{realax_2Ereal_lt}$ to be $\lambda V0T1 \in ty_2E\text{realax_2Ereal}.\lambda V1T2 \in ty_2E\text{realax_2Ereal}.V1T2$.

Definition 63 We define $c_2E\text{real_2Ereal_lte}$ to be $\lambda V0x \in ty_2E\text{realax_2Ereal}.\lambda V1y \in ty_2E\text{realax_2Ereal}.V1y$.

Definition 64 We define $c_2E\text{real_2Eabs}$ to be $\lambda V0x \in ty_2E\text{realax_2Ereal}.(ap \ (ap \ (ap \ (c_2E\text{bool_2ECON}) \ V0x)))$.

Definition 65 We define $c_2E\text{arithmetic_2E_3C_3D}$ to be $\lambda V0m \in ty_2E\text{num_2Enum}.\lambda V1n \in ty_2E\text{num_2Enum}.V1n$.

Let $c_2E\text{arithmetic_2E_2A} : \iota$ be given. Assume the following.

$$c_2E\text{arithmetic_2E_2A} \in ((ty_2E\text{num_2Enum}^{ty_2E\text{num_2Enum}}) \ ty_2E\text{num_2Enum}) \quad (50)$$

Assume the following.

$$(\forall V0n \in ty_2E\text{num_2Enum}.(p \ (ap \ (ap \ c_2E\text{arithmetic_2E_3C_3D} \ c_2E\text{num_2E0}) \ V0n))) \quad (51)$$

Assume the following.

$$(\forall V0m \in ty_2E\text{num_2Enum}.(\forall V1n \in ty_2E\text{num_2Enum}.(\neg(p \ (ap \ (ap \ c_2E\text{arithmetic_2E_3C_3D} \ V0m) \ V1n)) \Leftrightarrow (p \ (ap \ (ap \ c_2E\text{prim_rec_2E_3C} \ V1n) \ V0m))))) \quad (52)$$

Assume the following.

$$(\forall V0m \in ty_2E\text{num_2Enum}.(\forall V1n \in ty_2E\text{num_2Enum}.((ap \ (ap \ c_2E\text{arithmetic_2E_2B} \ V0m) \ V1n) = c_2E\text{num_2E0}) \Leftrightarrow ((V0m = c_2E\text{num_2E0}) \wedge (V1n = c_2E\text{num_2E0})))) \quad (53)$$

Assume the following.

$$((\forall V0n \in ty_2E\text{num_2Enum}.((p \ (ap \ (ap \ c_2E\text{arithmetic_2E_3C_3D} \ c_2E\text{num_2E0}) \ V0n) \ c_2E\text{num_2E0}) \Leftrightarrow (V0n = c_2E\text{num_2E0}))) \wedge (\forall V1m \in ty_2E\text{num_2Enum}.(\forall V2n \in ty_2E\text{num_2Enum}.((p \ (ap \ (ap \ c_2E\text{arithmetic_2E_3C_3D} \ c_2E\text{num_2ESUC} \ V2n)) \ Leftrightarrow ((V1m = (ap \ c_2E\text{num_2ESUC} \ V2n)) \vee (p \ (ap \ (ap \ c_2E\text{arithmetic_2E_3C_3D} \ V1m) \ V2n)))))))) \quad (54)$$

Assume the following.

$$\begin{aligned}
& \forall A_{27t}.nonempty A_{27t} \Rightarrow \forall A_{27w}.nonempty A_{27w} \Rightarrow \\
& \forall V0x \in (ty_2Ebinary_ieee_2Efloat A_{27t} A_{27w}).(\forall V1y \in \\
& (ty_2Ebinary_ieee_2Efloat A_{27t} A_{27w}).(((ap(c_2Ebinary_ieee_2Efloat_to_real \\
& A_{27t} A_{27w}) V0x) = (ap(c_2Ebinary_ieee_2Efloat_to_real A_{27t} \\
& A_{27w}) V1y)) \Leftrightarrow ((V0x = V1y) \vee ((p(ap(c_2Ebinary_ieee_2Efloat_is_zero \\
& A_{27t} A_{27w}) V0x)) \wedge (p(ap(c_2Ebinary_ieee_2Efloat_is_zero \\
& A_{27t} A_{27w}) V1y)))))))
\end{aligned} \tag{55}$$

Assume the following.

$$\begin{aligned}
& \forall A_{27t}.nonempty A_{27t} \Rightarrow \forall A_{27w}.nonempty A_{27w} \Rightarrow \\
& \forall V0x \in (ty_2Ebinary_ieee_2Efloat A_{27t} A_{27w}).(\forall V1y \in \\
& (ty_2Ebinary_ieee_2Efloat A_{27t} A_{27w}).(((\neg((ap(c_2Ebinary_ieee_2Efloat_to_real \\
& A_{27t} A_{27w}) V0x) = (ap(c_2Ebinary_ieee_2Efloat_to_real A_{27t} \\
& A_{27w}) V1y))) \wedge (\neg(p(ap(ap(c_2Ebinary_ieee_2EExponent_boundary \\
& A_{27t} A_{27w}) V1y) V0x)))) \Rightarrow (p(ap(ap(c_2Ereal_2Ereal_lte(ap(c_2Ebinary_ieee_2EULP \\
& A_{27t} A_{27w}) (ap(ap(c_2Epair_2E_2C \\
& ty_2Efcp_2Ecart 2 A_{27w}) (ty_2Ebool_2Eitself A_{27t})) (ap(c_2Ebinary_ieee_2Efloat_Exponent \\
& A_{27t} A_{27w}) V0x)) (c_2Ebool_2Eth_value A_{27t}))) (ap c_2Ereal_2Eabs \\
& (ap(ap(c_2Ereal_2Ereal_sub(ap(c_2Ebinary_ieee_2Efloat_to_real \\
& A_{27t} A_{27w}) V0x)) (ap(c_2Ebinary_ieee_2Efloat_to_real A_{27t} \\
& A_{27w}) V1y)))))))
\end{aligned} \tag{56}$$

Assume the following.

$$True \tag{57}$$

Assume the following.

$$\begin{aligned}
& (\forall V0t1 \in 2.(\forall V1t2 \in 2.(((p V0t1) \Rightarrow (p V1t2)) \Rightarrow (((p \\
& V1t2) \Rightarrow (p V0t1)) \Rightarrow ((p V0t1) \Leftrightarrow (p V1t2))))))
\end{aligned} \tag{58}$$

Assume the following.

$$(\forall V0t \in 2.(False \Rightarrow (p V0t))) \tag{59}$$

Assume the following.

$$(\forall V0t \in 2.((p V0t) \vee (\neg(p V0t)))) \tag{60}$$

Assume the following.

$$\begin{aligned}
& (\forall V0t \in 2.(((True \wedge (p V0t)) \Leftrightarrow (p V0t)) \wedge (((p V0t) \wedge True) \Leftrightarrow \\
& (p V0t)) \wedge (((False \wedge (p V0t)) \Leftrightarrow False) \wedge (((p V0t) \wedge False) \Leftrightarrow False) \wedge \\
& (((p V0t) \wedge (p V0t)) \Leftrightarrow (p V0t))))))
\end{aligned} \tag{61}$$

Assume the following.

$$\begin{aligned}
& (\forall V0t \in 2.(((True \vee (p V0t)) \Leftrightarrow True) \wedge (((p V0t) \vee True) \Leftrightarrow True) \wedge \\
& (((False \vee (p V0t)) \Leftrightarrow (p V0t)) \wedge (((p V0t) \vee False) \Leftrightarrow (p V0t)) \wedge (((p V0t) \vee \\
& (p V0t)) \Leftrightarrow (p V0t))))))
\end{aligned} \tag{62}$$

Assume the following.

$$(\forall V0t \in 2.(((True \Rightarrow (p V0t)) \Leftrightarrow (p V0t)) \wedge (((p V0t) \Rightarrow True) \Leftrightarrow True) \wedge (((False \Rightarrow (p V0t)) \Leftrightarrow True) \wedge (((p V0t) \Rightarrow (p V0t)) \Leftrightarrow True) \wedge (((p V0t) \Rightarrow False) \Leftrightarrow (\neg(p V0t))))))) \quad (63)$$

Assume the following.

$$((\forall V0t \in 2.((\neg(\neg(p V0t)) \Leftrightarrow (p V0t))) \wedge (((\neg True) \Leftrightarrow False) \wedge ((\neg False) \Leftrightarrow True)))) \quad (64)$$

Assume the following.

$$\forall A_27a.\text{nonempty } A_27a \Rightarrow (\forall V0x \in A_27a.(V0x = V0x)) \quad (65)$$

Assume the following.

$$\forall A_27a.\text{nonempty } A_27a \Rightarrow (\forall V0x \in A_27a.((V0x = V0x) \Leftrightarrow True)) \quad (66)$$

Assume the following.

$$\forall A_27a.\text{nonempty } A_27a \Rightarrow (\forall V0x \in A_27a.(\forall V1y \in A_27a.((V0x = V1y) \Leftrightarrow (V1y = V0x)))) \quad (67)$$

Assume the following.

$$(\forall V0t \in 2.(((True \Leftrightarrow (p V0t)) \Leftrightarrow (p V0t)) \wedge (((p V0t) \Leftrightarrow True) \Leftrightarrow (p V0t)) \wedge (((False \Leftrightarrow (p V0t)) \Leftrightarrow (\neg(p V0t))) \wedge (((p V0t) \Leftrightarrow False) \Leftrightarrow (\neg(p V0t))))))) \quad (68)$$

Assume the following.

$$\begin{aligned} \forall A_27a.\text{nonempty } A_27a \Rightarrow & (\forall V0t1 \in A_27a.(\forall V1t2 \in A_27a.((ap(ap(ap(c_2Ebool_2ECOND A_27a) c_2Ebool_2ET) V0t1) \\ & V1t2) = V0t1) \wedge ((ap(ap(ap(c_2Ebool_2ECOND A_27a) c_2Ebool_2EF) V0t1) V1t2) = V1t2)))) \end{aligned} \quad (69)$$

Assume the following.

$$(\forall V0A \in 2.(\forall V1B \in 2.(((\neg((p V0A) \wedge (p V1B))) \Leftrightarrow ((\neg(p V0A) \vee (p V1B)))) \wedge ((\neg((p V0A) \vee (p V1B))) \Leftrightarrow ((\neg(p V0A) \wedge (\neg(p V1B))))))) \quad (70)$$

Assume the following.

$$(\forall V0A \in 2.(\forall V1B \in 2.(\forall V2C \in 2.(((p V0A) \vee (p V1B)) \wedge ((p V0A) \wedge (p V2C))) \Leftrightarrow (((p V0A) \vee (p V1B)) \wedge ((p V0A) \vee (p V2C))))))) \quad (71)$$

Assume the following.

$$\begin{aligned}
& ((\forall V0n \in ty_2Enum_2Enum.((ap (ap c_2Earithmetic_2E_2B \\
& c_2Enum_2E0) V0n) = V0n)) \wedge ((\forall V1n \in ty_2Enum_2Enum.((ap \\
& (ap c_2Earithmetic_2E_2B V1n) c_2Enum_2E0) = V1n)) \wedge ((\forall V2n \in \\
ty_2Enum_2Enum.(\forall V3m \in ty_2Enum_2Enum.((ap (ap c_2Earithmetic_2E_2B \\
& (ap c_2Earithmetic_2ENUMERAL V2n)) (ap c_2Earithmetic_2ENUMERAL \\
V3m)) = (ap c_2Earithmetic_2ENUMERAL (ap c_2Enum_2EiZ (ap \\
& (ap c_2Earithmetic_2E_2B V2n) V3m))))))) \wedge ((\forall V4n \in ty_2Enum_2Enum. \\
& ((ap (ap c_2Earithmetic_2E_2A c_2Enum_2E0) V4n) = c_2Enum_2E0)) \wedge \\
& ((\forall V5n \in ty_2Enum_2Enum.((ap (ap c_2Earithmetic_2E_2A \\
V5n) c_2Enum_2E0) = c_2Enum_2E0)) \wedge ((\forall V6n \in ty_2Enum_2Enum. \\
& ((\forall V7m \in ty_2Enum_2Enum.((ap (ap c_2Earithmetic_2E_2A \\
& ap c_2Earithmetic_2ENUMERAL V6n)) (ap c_2Earithmetic_2ENUMERAL \\
V7m)) = (ap c_2Earithmetic_2ENUMERAL (ap (ap c_2Earithmetic_2E_2A \\
V6n) V7m)))))) \wedge ((\forall V8n \in ty_2Enum_2Enum.((ap (ap c_2Earithmetic_2E_2D \\
c_2Enum_2E0) V8n) = c_2Enum_2E0)) \wedge ((\forall V9n \in ty_2Enum_2Enum. \\
& ((ap (ap c_2Earithmetic_2E_2D V9n) c_2Enum_2E0) = V9n)) \wedge ((\forall V10n \in \\
ty_2Enum_2Enum.(\forall V11m \in ty_2Enum_2Enum.((ap (ap c_2Earithmetic_2E_2D \\
& (ap c_2Earithmetic_2ENUMERAL V10n)) (ap c_2Earithmetic_2ENUMERAL \\
V11m)) = (ap c_2Earithmetic_2ENUMERAL (ap (ap c_2Earithmetic_2E_2D \\
V10n) V11m)))))) \wedge ((\forall V12n \in ty_2Enum_2Enum.((ap (ap c_2Earithmetic_2EEXP \\
c_2Enum_2E0) (ap c_2Earithmetic_2ENUMERAL (ap c_2Earithmetic_2EBIT1 \\
V12n))) = c_2Enum_2E0)) \wedge ((\forall V13n \in ty_2Enum_2Enum.((ap \\
& (ap c_2Earithmetic_2EEXP c_2Enum_2E0) (ap c_2Earithmetic_2ENUMERAL \\
(ap c_2Earithmetic_2EBIT2 V13n))) = c_2Enum_2E0)) \wedge ((\forall V14n \in \\
ty_2Enum_2Enum.((ap (ap c_2Earithmetic_2EEXP V14n) c_2Enum_2E0) = \\
& (ap c_2Earithmetic_2ENUMERAL (ap c_2Earithmetic_2EBIT1 c_2Earithmetic_2EZERO)))))) \wedge \\
& ((\forall V15n \in ty_2Enum_2Enum.(\forall V16m \in ty_2Enum_2Enum. \\
& ((ap (ap c_2Earithmetic_2EEXP (ap c_2Earithmetic_2ENUMERAL V15n)) \\
(ap c_2Earithmetic_2ENUMERAL V16m)) = (ap c_2Earithmetic_2ENUMERAL \\
(ap (ap c_2Earithmetic_2EEXP V15n) V16m)))))) \wedge (((ap c_2Enum_2ESUC \\
c_2Enum_2E0) = (ap c_2Earithmetic_2ENUMERAL (ap c_2Earithmetic_2EBIT1 \\
c_2Earithmetic_2EZERO)))) \wedge ((\forall V17n \in ty_2Enum_2Enum. \\
& (ap c_2Enum_2ESUC (ap c_2Earithmetic_2ENUMERAL V17n)) = (ap c_2Earithmetic_2ENUMERAL \\
(ap c_2Enum_2ESUC V17n)))) \wedge (((ap c_2Eprim_rec_2EPRE c_2Enum_2E0) = \\
c_2Enum_2E0) \wedge ((\forall V18n \in ty_2Enum_2Enum.((ap c_2Eprim_rec_2EPRE \\
(ap c_2Earithmetic_2ENUMERAL V18n)) = (ap c_2Earithmetic_2ENUMERAL \\
(ap c_2Eprim_rec_2EPRE V18n)))))) \wedge ((\forall V19n \in ty_2Enum_2Enum. \\
& (((ap c_2Earithmetic_2ENUMERAL V19n) = c_2Enum_2E0) \Leftrightarrow (V19n = c_2Earithmetic_2EZERO))) \wedge \\
& ((\forall V20n \in ty_2Enum_2Enum.((c_2Enum_2E0) = (ap c_2Earithmetic_2ENUMERAL \\
V20n)) \Leftrightarrow (V20n = c_2Earithmetic_2EZERO))) \wedge ((\forall V21n \in ty_2Enum_2Enum. \\
& ((\forall V22m \in ty_2Enum_2Enum.(((ap c_2Earithmetic_2ENUMERAL \\
V21n) = (ap c_2Earithmetic_2ENUMERAL V22m)) \Leftrightarrow (V21n = V22m)))) \wedge \\
& ((\forall V23n \in ty_2Enum_2Enum.((p (ap (ap c_2Eprim_rec_2E_3C \\
V23n) c_2Enum_2E0)) \Leftrightarrow False)) \wedge ((\forall V24n \in ty_2Enum_2Enum. \\
& ((p (ap (ap c_2Eprim_rec_2E_3C c_2Enum_2E0) (ap c_2Earithmetic_2ENUMERAL \\
V24n))) \Leftrightarrow (p (ap (ap c_2Eprim_rec_2E_3C c_2Earithmetic_2EZERO) \\
V24n)))) \wedge ((\forall V25n \in ty_2Enum_2Enum.(\forall V26m \in ty_2Enum_2Enum. \\
& ((p (ap (ap c_2Eprim_rec_2E_3C (ap c_2Earithmetic_2ENUMERAL \\
V25n)) (ap c_2Earithmetic_2ENUMERAL V26m))) \Leftrightarrow (p (ap (ap c_2Eprim_rec_2E_3C \\
V25n) V26m)))))) \wedge ((\forall V27n \in ty_2Enum_2Enum.((p (ap (ap c_2Earithmetic_2E_3E \\
c_2Enum_2E0) V27n)) \Leftrightarrow False)) \wedge ((\forall V28n \in ty_2Enum_2Enum. \\
& ((p (ap (ap c_2Earithmetic_2E_3E (ap c_2Earithmetic_2ENUMERAL \\
V28n)) c_2Enum_2E0)) \Leftrightarrow (p (ap (ap c_2Eprim_rec_2E_3C c_2Earithmetic_2EZERO) \\
V28n)))) \wedge ((\forall V29n \in ty_2Enum_2Enum.(\forall V30m \in ty_2Enum_2Enum. \\
& ((p (ap (ap c_2Earithmetic_2E_3E (ap c_2Earithmetic_2ENUMERAL \\
V29n)) (ap c_2Earithmetic_2ENUMERAL V30m))) \Leftrightarrow (p (ap (ap c_2Eprim_rec_2E_3C \\
V30m) V29n)))) \wedge ((\forall V31n \in ty_2Enum_2Enum.((p (ap (ap c_2Earithmetic_2E_3C_3D \\
c_2Enum_2E0) V31n)) \Leftrightarrow True)) \wedge ((\forall V32n \in ty_2Enum_2Enum. \\
& ((p (ap (ap c_2Earithmetic_2E_3C_3D (ap c_2Earithmetic_2ENUMERAL \\
V32n)))) \wedge ((\forall V33n \in ty_2Enum_2Enum.((p (ap (ap c_2Earithmetic_2E_3C_3D \\
c_2Enum_2E0) V33n)) \Leftrightarrow False)) \wedge ((\forall V34n \in ty_2Enum_2Enum. \\
& ((p (ap (ap c_2Earithmetic_2E_3C_3D (ap c_2Earithmetic_2ENUMERAL \\
V34n)) \Leftrightarrow False)))))))
\end{aligned}$$

Assume the following.

Assume the following.

$$\begin{aligned}
& (\forall V0n \in ty_2Enum_2Enum. (\forall V1m \in ty_2Enum_2Enum. (\\
& ((p (ap (ap c_2Eprim_rec_2E_3C c_2Earithmetic_2EZERO) (ap c_2Earithmetic_2EBIT1 \\
& V0n))) \Leftrightarrow True) \wedge (((p (ap (ap c_2Eprim_rec_2E_3C c_2Earithmetic_2EZERO) \\
& (ap c_2Earithmetic_2EBIT2 V0n))) \Leftrightarrow True) \wedge (((p (ap (ap c_2Eprim_rec_2E_3C \\
& V0n) c_2Earithmetic_2EZERO)) \Leftrightarrow False) \wedge (((p (ap (ap c_2Eprim_rec_2E_3C \\
& (ap c_2Earithmetic_2EBIT1 V0n)) (ap c_2Earithmetic_2EBIT1 V1m))) \Leftrightarrow \\
& (p (ap (ap c_2Eprim_rec_2E_3C V0n) V1m))) \wedge (((p (ap (ap c_2Eprim_rec_2E_3C \\
& (ap c_2Earithmetic_2EBIT2 V0n)) (ap c_2Earithmetic_2EBIT2 V1m))) \Leftrightarrow \\
& (p (ap (ap c_2Eprim_rec_2E_3C V0n) V1m))) \wedge (((p (ap (ap c_2Eprim_rec_2E_3C \\
& (ap c_2Earithmetic_2EBIT1 V0n)) (ap c_2Earithmetic_2EBIT2 V1m))) \Leftrightarrow \\
& (\neg(p (ap (ap c_2Eprim_rec_2E_3C V1m) V0n))) \wedge ((p (ap (ap c_2Eprim_rec_2E_3C \\
& (ap c_2Earithmetic_2EBIT2 V0n)) (ap c_2Earithmetic_2EBIT1 V1m))) \Leftrightarrow \\
& (p (ap (ap c_2Eprim_rec_2E_3C V0n) V1m)))))))))) \\
\end{aligned} \tag{74}$$

Assume the following.

$$\begin{aligned}
& (\forall V0n \in ty_2Enum_2Enum. (((ap c_2Enumeral_2EiDUB (ap c_2Earithmetic_2EBIT1 \\
& V0n)) = (ap c_2Earithmetic_2EBIT2 (ap c_2Enumeral_2EiDUB V0n))) \wedge \\
& (((ap c_2Enumeral_2EiDUB (ap c_2Earithmetic_2EBIT2 V0n)) = (ap \\
& c_2Earithmetic_2EBIT2 (ap c_2Earithmetic_2EBIT1 V0n))) \wedge ((ap \\
& c_2Enumeral_2EiDUB c_2Earithmetic_2EZERO) = c_2Earithmetic_2EZERO))) \\
\end{aligned} \tag{75}$$

Assume the following.

$$\begin{aligned}
& (\forall V0n \in ty_2Enum_2Enum. (\forall V1m \in ty_2Enum_2Enum. (\\
& ((ap (ap c_2Earithmetic_2E_2A c_2Earithmetic_2EZERO) V0n) = c_2Earithmetic_2EZERO) \wedge \\
& (((ap (ap c_2Earithmetic_2E_2A V0n) c_2Earithmetic_2EZERO) = \\
& c_2Earithmetic_2EZERO) \wedge (((ap (ap c_2Earithmetic_2E_2A (ap c_2Earithmetic_2EBIT1 \\
& V0n)) V1m) = (ap c_2Enumeral_2EiZ (ap (ap c_2Earithmetic_2E_2B \\
& (ap c_2Enumeral_2EiDUB (ap (ap c_2Earithmetic_2E_2A V0n) V1m))) \\
& V1m))) \wedge ((ap (ap c_2Earithmetic_2E_2A (ap c_2Earithmetic_2EBIT2 \\
& V0n)) V1m) = (ap c_2Enumeral_2EiDUB (ap c_2Enumeral_2EiZ (ap (ap \\
& c_2Earithmetic_2E_2B (ap (ap c_2Earithmetic_2E_2A V0n) V1m)) \\
& V1m)))))))))) \\
\end{aligned} \tag{76}$$

Assume the following.

$$\begin{aligned}
& (\forall V0x \in ty_2Erealax_2Ereal. (\forall V1y \in ty_2Erealax_2Ereal. \\
& ((ap (ap c_2Erealax_2Ereal_add V0x) V1y) = (ap (ap c_2Erealax_2Ereal_add \\
& V1y) V0x)))) \\
\end{aligned} \tag{77}$$

Assume the following.

$$\begin{aligned}
 & (\forall V0x \in ty_2Erealax_2Ereal. (\forall V1y \in ty_2Erealax_2Ereal. \\
 & (\forall V2z \in ty_2Erealax_2Ereal. ((ap (ap c_2Erealax_2Ereal_add \\
 & V0x) (ap (ap c_2Erealax_2Ereal_add V1y) V2z)) = (ap (ap c_2Erealax_2Ereal_add \\
 & (ap (ap c_2Erealax_2Ereal_add V0x) V1y)) V2z)))))) \\
 \end{aligned} \tag{78}$$

Assume the following.

$$(\forall V0x \in ty_2Erealax_2Ereal. ((ap (ap c_2Erealax_2Ereal_add \\
 (ap c_2Ereal_2Ereal_of_num c_2Enum_2E0)) V0x) = V0x)) \tag{79}$$

Assume the following.

$$\begin{aligned}
 & (\forall V0x \in ty_2Erealax_2Ereal. ((ap (ap c_2Erealax_2Ereal_add \\
 & (ap c_2Erealax_2Ereal_neg V0x)) V0x) = (ap c_2Ereal_2Ereal_of_num \\
 & c_2Enum_2E0))) \\
 \end{aligned} \tag{80}$$

Assume the following.

$$\begin{aligned}
 & (\forall V0x \in ty_2Erealax_2Ereal. (\forall V1y \in ty_2Erealax_2Ereal. \\
 & (\forall V2z \in ty_2Erealax_2Ereal. (((p (ap (ap c_2Erealax_2Ereal_lt \\
 & V0x) V1y)) \wedge (p (ap (ap c_2Erealax_2Ereal_lt V1y) V2z))) \Rightarrow (p (ap \\
 & (ap c_2Erealax_2Ereal_lt V0x) V2z)))))) \\
 \end{aligned} \tag{81}$$

Assume the following.

$$\begin{aligned}
 & (\forall V0x \in ty_2Erealax_2Ereal. (\forall V1y \in ty_2Erealax_2Ereal. \\
 & (\forall V2z \in ty_2Erealax_2Ereal. ((ap (ap c_2Erealax_2Ereal_mul \\
 & V0x) (ap (ap c_2Erealax_2Ereal_mul V1y) V2z)) = (ap (ap c_2Erealax_2Ereal_mul \\
 & (ap (ap c_2Erealax_2Ereal_mul V0x) V1y)) V2z)))))) \\
 \end{aligned} \tag{82}$$

Assume the following.

$$(\forall V0x \in ty_2Erealax_2Ereal. ((ap (ap c_2Erealax_2Ereal_mul \\
 (ap c_2Ereal_2Ereal_of_num (ap c_2Earthmetic_2ENUMERAL (\\
 ap c_2Earthmetic_2EBIT1 c_2Earthmetic_2EZERO))) V0x) = V0x)) \tag{83}$$

Assume the following.

$$\begin{aligned}
 & (\forall V0x \in ty_2Erealax_2Ereal. (\forall V1y \in ty_2Erealax_2Ereal. \\
 & (((p (ap (ap c_2Erealax_2Ereal_lt (ap c_2Ereal_2Ereal_of_num \\
 & c_2Enum_2E0)) V0x)) \wedge (p (ap (ap c_2Erealax_2Ereal_lt (ap c_2Ereal_2Ereal_of_num \\
 & c_2Enum_2E0)) V1y))) \Rightarrow (p (ap (ap c_2Erealax_2Ereal_lt (ap c_2Ereal_2Ereal_of_num \\
 & c_2Enum_2E0)) (ap (ap c_2Erealax_2Ereal_mul V0x) V1y)))))) \\
 \end{aligned} \tag{84}$$

Assume the following.

$$(\forall V0x \in ty_2Erealax_2Ereal. ((ap (ap c_2Erealax_2Ereal_add \\
 V0x) (ap c_2Ereal_2Ereal_of_num c_2Enum_2E0)) = V0x)) \tag{85}$$

Assume the following.

$$(\forall V0x \in ty_2Erealax_2Ereal. ((ap (ap c_2Erealax_2Ereal_add V0x) (ap c_2Erealax_2Ereal_neg V0x)) = (ap c_2Ereal_2Ereal_of_num c_2Enum_2E0))) \quad (86)$$

Assume the following.

$$(\forall V0x \in ty_2Erealax_2Ereal. (\forall V1y \in ty_2Erealax_2Ereal. ((ap c_2Erealax_2Ereal_neg (ap (ap c_2Erealax_2Ereal_add V0x) V1y)) = (ap (ap c_2Erealax_2Ereal_add (ap c_2Erealax_2Ereal_neg V0x)) (ap c_2Erealax_2Ereal_neg V1y)))))) \quad (87)$$

Assume the following.

$$(\forall V0x \in ty_2Erealax_2Ereal. ((ap (ap c_2Erealax_2Ereal_mul (ap c_2Ereal_2Ereal_of_num c_2Enum_2E0)) V0x) = (ap c_2Ereal_2Ereal_of_num c_2Enum_2E0))) \quad (88)$$

Assume the following.

$$(\forall V0x \in ty_2Erealax_2Ereal. ((ap (ap c_2Erealax_2Ereal_mul V0x) (ap c_2Ereal_2Ereal_of_num c_2Enum_2E0)) = (ap c_2Ereal_2Ereal_of_num c_2Enum_2E0))) \quad (89)$$

Assume the following.

$$(\forall V0x \in ty_2Erealax_2Ereal. (\forall V1y \in ty_2Erealax_2Ereal. (\forall V2z \in ty_2Erealax_2Ereal. ((p (ap (ap c_2Erealax_2Ereal_lt (ap (ap c_2Erealax_2Ereal_add V0x) V1y)) (ap (ap c_2Erealax_2Ereal_add V0x) V2z))) \Leftrightarrow (p (ap (ap c_2Erealax_2Ereal_lt V1y) V2z))))))) \quad (90)$$

Assume the following.

$$(\forall V0x \in ty_2Erealax_2Ereal. (\forall V1y \in ty_2Erealax_2Ereal. ((p (ap (ap c_2Ereal_2Ereal_lte V0x) V1y)) \vee (p (ap (ap c_2Ereal_2Ereal_lte V1y) V0x)))))) \quad (91)$$

Assume the following.

$$(\forall V0x \in ty_2Erealax_2Ereal. (\forall V1y \in ty_2Erealax_2Ereal. (\forall V2z \in ty_2Erealax_2Ereal. (((p (ap (ap c_2Erealax_2Ereal_lt V0x) V1y)) \wedge (p (ap (ap c_2Ereal_2Ereal_lte V1y) V2z))) \Rightarrow (p (ap (ap c_2Erealax_2Ereal_lt V0x) V2z))))))) \quad (92)$$

Assume the following.

$$(\forall V0x \in ty_2Erealax_2Ereal. (\forall V1y \in ty_2Erealax_2Ereal. (\forall V2z \in ty_2Erealax_2Ereal. (((p (ap (ap c_2Ereal_2Ereal_lte V0x) V1y)) \wedge (p (ap (ap c_2Erealax_2Ereal_lt V1y) V2z))) \Rightarrow (p (ap (ap c_2Erealax_2Ereal_lt V0x) V2z))))))) \quad (93)$$

Assume the following.

$$\begin{aligned} & (\forall V0x \in ty_2Erealax_2Ereal. (\forall V1y \in ty_2Erealax_2Ereal. \\ & (\forall V2z \in ty_2Erealax_2Ereal. (((p (ap (ap c_2Ereal_2Ereal_lte \\ & V0x) V1y)) \wedge (p (ap (ap c_2Ereal_2Ereal_lte V1y) V2z))) \Rightarrow (p (ap (\\ & ap c_2Ereal_2Ereal_lte V0x) V2z))))))) \end{aligned} \quad (94)$$

Assume the following.

$$\begin{aligned} & (\forall V0x \in ty_2Erealax_2Ereal. (\forall V1y \in ty_2Erealax_2Ereal. \\ & (((p (ap (ap c_2Ereal_2Ereal_lte V0x) V1y)) \wedge (p (ap (ap c_2Ereal_2Ereal_lte \\ & V1y) V0x))) \Leftrightarrow (V0x = V1y)))) \end{aligned} \quad (95)$$

Assume the following.

$$\begin{aligned} & (\forall V0x \in ty_2Erealax_2Ereal. (\forall V1y \in ty_2Erealax_2Ereal. \\ & (((p (ap (ap c_2Ereal_2Ereal_lte (ap c_2Ereal_2Ereal_of_num \\ & c_2Enum_2E0)) V0x)) \wedge (p (ap (ap c_2Ereal_2Ereal_lte (ap c_2Ereal_2Ereal_of_num \\ & c_2Enum_2E0)) V1y))) \Rightarrow (p (ap (ap c_2Ereal_2Ereal_lte (ap c_2Ereal_2Ereal_of_num \\ & c_2Enum_2E0)) (ap (ap c_2Erealax_2Ereal_mul V0x) V1y))))))) \end{aligned} \quad (96)$$

Assume the following.

$$\begin{aligned} & (\forall V0m \in ty_2Enum_2Enum. (\forall V1n \in ty_2Enum_2Enum. (\\ & (ap (ap c_2Erealax_2Ereal_add (ap c_2Ereal_2Ereal_of_num \\ & V0m)) (ap c_2Ereal_2Ereal_of_num V1n)) = (ap c_2Ereal_2Ereal_of_num \\ & (ap (ap c_2Earithmetic_2E_2B V0m) V1n)))))) \end{aligned} \quad (97)$$

Assume the following.

$$\begin{aligned} & (\forall V0x \in ty_2Erealax_2Ereal. (\forall V1y \in ty_2Erealax_2Ereal. \\ & ((ap (ap c_2Erealax_2Ereal_mul V0x) (ap c_2Erealax_2Ereal_neg \\ & V1y)) = (ap c_2Erealax_2Ereal_neg (ap (ap c_2Erealax_2Ereal_mul \\ & V0x) V1y))))) \end{aligned} \quad (98)$$

Assume the following.

$$\begin{aligned} & (\forall V0x \in ty_2Erealax_2Ereal. (\forall V1y \in ty_2Erealax_2Ereal. \\ & ((ap (ap c_2Erealax_2Ereal_mul (ap c_2Erealax_2Ereal_neg V0x)) \\ & V1y) = (ap c_2Erealax_2Ereal_neg (ap (ap c_2Erealax_2Ereal_mul \\ & V0x) V1y))))) \end{aligned} \quad (99)$$

Assume the following.

$$\begin{aligned} & (\forall V0y \in ty_2Erealax_2Ereal. (\forall V1x \in ty_2Erealax_2Ereal. \\ & ((p (ap (ap c_2Erealax_2Ereal_lt V1x) V0y)) \Leftrightarrow (\neg(p (ap (ap c_2Ereal_2Ereal_lte \\ & V0y) V1x)))))) \end{aligned} \quad (100)$$

Assume the following.

$$\begin{aligned}
 & (\forall V0x \in ty_2Erealax_2Ereal. (\forall V1y \in ty_2Erealax_2Ereal. \\
 & (\forall V2z \in ty_2Erealax_2Ereal. ((p (ap (ap c_2Ereal_2Ereal_lte \\
 & V1y) V2z)) \Rightarrow (p (ap (ap c_2Ereal_2Ereal_lte (ap (ap c_2Erealax_2Ereal_add \\
 & V0x) V1y)) (ap (ap c_2Erealax_2Ereal_add V0x) V2z))))))) \\
 \end{aligned} \tag{101}$$

Assume the following.

$$\begin{aligned}
 & (\forall V0x \in ty_2Erealax_2Ereal. (\forall V1y \in ty_2Erealax_2Ereal. \\
 & ((p (ap (ap c_2Ereal_2Ereal_lte (ap c_2Erealax_2Ereal_neg V0x)) \\
 & V1y)) \Leftrightarrow (p (ap (ap c_2Ereal_2Ereal_lte (ap c_2Ereal_2Ereal_of_num \\
 & c_2Enum_2E0)) (ap (ap c_2Erealax_2Ereal_add V0x) V1y)))))) \\
 \end{aligned} \tag{102}$$

Assume the following.

$$\begin{aligned}
 & (\forall V0x \in ty_2Erealax_2Ereal. (\forall V1y \in ty_2Erealax_2Ereal. \\
 & ((p (ap (ap c_2Ereal_2Ereal_lte (ap c_2Erealax_2Ereal_neg V0x)) \\
 & (ap c_2Erealax_2Ereal_neg V1y))) \Leftrightarrow (p (ap (ap c_2Ereal_2Ereal_lte \\
 & V1y) V0x)))))) \\
 \end{aligned} \tag{103}$$

Assume the following.

$$(\forall V0x \in ty_2Erealax_2Ereal. ((ap c_2Erealax_2Ereal_neg \\
 (ap c_2Erealax_2Ereal_neg V0x)) = V0x)) \tag{104}$$

Assume the following.

$$\begin{aligned}
 & (\forall V0x \in ty_2Erealax_2Ereal. (\forall V1y \in ty_2Erealax_2Ereal. \\
 & ((p (ap (ap c_2Ereal_2Ereal_lte V0x) (ap c_2Erealax_2Ereal_neg \\
 & V1y))) \Leftrightarrow (p (ap (ap c_2Ereal_2Ereal_lte (ap (ap c_2Erealax_2Ereal_add \\
 & V0x) V1y)) (ap c_2Ereal_2Ereal_of_num c_2Enum_2E0)))))) \\
 \end{aligned} \tag{105}$$

Assume the following.

$$\begin{aligned}
 & (\forall V0x \in ty_2Erealax_2Ereal. (\forall V1y \in ty_2Erealax_2Ereal. \\
 & (\forall V2z \in ty_2Erealax_2Ereal. ((ap (ap c_2Erealax_2Ereal_mul \\
 & V0x) (ap (ap c_2Erealax_2Ereal_add V1y) V2z)) = (ap (ap c_2Erealax_2Ereal_add \\
 & (ap (ap c_2Erealax_2Ereal_mul V0x) V1y)) (ap (ap c_2Erealax_2Ereal_mul \\
 & V0x) V2z)))))) \\
 \end{aligned} \tag{106}$$

Assume the following.

$$\begin{aligned}
 & (\forall V0x \in ty_2Erealax_2Ereal. (\forall V1y \in ty_2Erealax_2Ereal. \\
 & (\forall V2z \in ty_2Erealax_2Ereal. ((ap (ap c_2Erealax_2Ereal_mul \\
 & (ap (ap c_2Erealax_2Ereal_add V0x) V1y)) V2z) = (ap (ap c_2Erealax_2Ereal_add \\
 & (ap (ap c_2Erealax_2Ereal_mul V0x) V2z)) (ap (ap c_2Erealax_2Ereal_mul \\
 & V1y) V2z)))))) \\
 \end{aligned} \tag{107}$$

Assume the following.

$$\begin{aligned}
 & (\forall V0m \in ty_2Enum_2Enum. (\forall V1n \in ty_2Enum_2Enum. \\
 & (p (ap (ap c_2Ereal_2Ereal_lte (ap c_2Ereal_2Ereal_of_num \\
 & V0m)) (ap c_2Ereal_2Ereal_of_num V1n))) \Leftrightarrow (p (ap (ap c_2Earithmetic_2E_3C_3D \\
 & V0m) V1n)))) \\
 \end{aligned} \tag{108}$$

Assume the following.

$$\begin{aligned}
 & (\forall V0m \in ty_2Enum_2Enum. (\forall V1n \in ty_2Enum_2Enum. \\
 & (ap (ap c_2Erealax_2Ereal_mul (ap c_2Ereal_2Ereal_of_num \\
 & V0m)) (ap c_2Ereal_2Ereal_of_num V1n)) = (ap c_2Ereal_2Ereal_of_num \\
 & (ap (ap c_2Earithmetic_2E_2A V0m) V1n)))) \\
 \end{aligned} \tag{109}$$

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.

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

Assume the following.

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

Assume the following.

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

Assume the following.

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

Assume the following.

$$\begin{aligned}
 & (\forall V0p \in 2. (\forall V1q \in 2. (\forall V2r \in 2. (((p V0p) \Leftrightarrow \\
 & (p V1q) \wedge (p V2r))) \Leftrightarrow (((p V0p) \vee ((\neg(p V1q)) \vee (\neg(p V2r)))) \wedge (((p V1q) \vee \\
 & ((\neg(p V0p)))) \wedge ((p V2r) \vee (\neg(p V0p)))))))) \\
 \end{aligned} \tag{116}$$

Assume the following.

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

Assume the following.

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

Assume the following.

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

Assume the following.

$$(\forall V0p \in 2. (\forall V1q \in 2. ((\neg((p V0p) \Rightarrow (p V1q))) \Rightarrow (p V0p)))) \quad (120)$$

Assume the following.

$$(\forall V0p \in 2. (\forall V1q \in 2. ((\neg((p V0p) \Rightarrow (p V1q))) \Rightarrow (\neg(p V1q)))))) \quad (121)$$

Assume the following.

$$(\forall V0p \in 2. (\forall V1q \in 2. ((\neg((p V0p) \vee (p V1q))) \Rightarrow (\neg(p V0p)))))) \quad (122)$$

Assume the following.

$$(\forall V0p \in 2. (\forall V1q \in 2. ((\neg((p V0p) \vee (p V1q))) \Rightarrow (\neg(p V1q)))))) \quad (123)$$

Assume the following.

$$(\forall V0p \in 2. ((\neg(\neg(p V0p))) \Rightarrow (p V0p))) \quad (124)$$

Theorem 1

$$\begin{aligned}
& \forall A_{.27t}.nonempty\ A_{.27t} \Rightarrow \forall A_{.27w}.nonempty\ A_{.27w} \Rightarrow (\\
& \forall V0a \in (ty_{.2Ebinary_ieee_2Efloat}\ A_{.27t}\ A_{.27w}).(\forall V1b \in \\
& (ty_{.2Ebinary_ieee_2Efloat}\ A_{.27t}\ A_{.27w}).(\forall V2x \in ty_{.2Erealax_2Ereal}. \\
& (((\neg(p\ (ap\ (ap\ (c_{.2Ebinary_ieee_2Eexponent_boundary}\ A_{.27t} \\
& A_{.27w})\ V1b)\ V0a))) \wedge ((p\ (ap\ (ap\ c_{.2Erealax_2Ereal_lt}\ (ap\ c_{.2Ereal_2Eabs} \\
& (ap\ (ap\ c_{.2Ereal_2Ereal_sub}\ V2x)\ (ap\ (c_{.2Ebinary_ieee_2Efloat_to_real} \\
& A_{.27t}\ A_{.27w})\ V0a))))\ (ap\ (c_{.2Ebinary_ieee_2EULP}\ A_{.27t}\ A_{.27w}) \\
& (ap\ (ap\ (c_{.2Epair_2E_2C}\ (ty_{.2Efcp_2Ecart}\ 2\ A_{.27w})\ (ty_{.2Ebool_2Eitself} \\
& A_{.27t}))\ (ap\ (c_{.2Ebinary_ieee_2Efloat_Exponent}\ A_{.27t}\ A_{.27w}) \\
& V0a))\ (c_{.2Ebool_2Eth_value}\ A_{.27t})))))) \wedge ((p\ (ap\ (ap\ c_{.2Erealax_2Ereal_lt} \\
& (ap\ c_{.2Ereal_2Eabs}\ (ap\ (ap\ c_{.2Ereal_2Ereal_sub}\ V2x)\ (ap\ (c_{.2Ebinary_ieee_2Efloat_to_real} \\
& A_{.27t}\ A_{.27w})\ V1b))))\ (ap\ (c_{.2Ebinary_ieee_2EULP}\ A_{.27t}\ A_{.27w}) \\
& (ap\ (ap\ (c_{.2Epair_2E_2C}\ (ty_{.2Efcp_2Ecart}\ 2\ A_{.27w})\ (ty_{.2Ebool_2Eitself} \\
& A_{.27t}))\ (ap\ (c_{.2Ebinary_ieee_2Efloat_Exponent}\ A_{.27t}\ A_{.27w}) \\
& V0a))\ (c_{.2Ebool_2Eth_value}\ A_{.27t})))))) \wedge ((p\ (ap\ (ap\ c_{.2Ereal_2Ereal_lte} \\
& (ap\ c_{.2Ereal_2Eabs}\ (ap\ (c_{.2Ebinary_ieee_2Efloat_to_real} \\
& A_{.27t}\ A_{.27w})\ V0a))))\ (ap\ c_{.2Ereal_2Eabs}\ V2x))) \wedge (\neg(p\ (ap\ (c_{.2Ebinary_ieee_2Efloat_is_zero} \\
& A_{.27t}\ A_{.27w})\ V0a))))))) \Rightarrow (V1b = V0a)))) \\
\end{aligned}$$