

## t17\_binari\_3

(TMagj5zEYGLSHLF4fAQ1Xo1XQUWzGs4fCZx)

October 27, 2020

Let  $k7\_binarith : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $np\_1 : \iota$  be given. Let  $k10\_binarith : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k6\_margrel1 : \iota$  be given. Let  $k7\_margrel1 : \iota$  be given. Let  $k8\_margrel1 : \iota$  be given. Let  $v1\_xboole\_0 : \iota \Rightarrow o$  be given. Let  $k1\_xboole\_0 : \iota$  be given. Let  $v7\_ordinal1 : \iota \Rightarrow o$  be given. Let  $v3\_card\_1 : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $m2\_finseq\_1 : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $k6\_binarith : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $r1\_binarith : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $k2\_nat\_1 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $m1\_subset\_1 : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $k4\_ordinal1 : \iota$  be given. Let  $v1\_xcmplx\_0 : \iota \Rightarrow o$  be given. Let  $k2\_xcmplx\_0 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k6\_numbers : \iota$  be given. Let  $k12\_finseq\_1 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k8\_binarith : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $v2\_xreal\_0 : \iota \Rightarrow o$  be given. Let  $m2\_subset\_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $k1\_numbers : \iota$  be given. Let  $k5\_numbers : \iota$  be given. Let  $k4\_xcmplx\_0 : \iota \Rightarrow \iota$  be given. Let  $k6\_xcmplx\_0 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $np\_0 : \iota$  be given. Let  $m1\_finseq\_1 : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $k2\_xboolean : \iota$  be given. Let  $k1\_xboolean : \iota$  be given. Let  $k5\_finseq\_1 : \iota \Rightarrow \iota$  be given. Let  $v1\_xreal\_0 : \iota \Rightarrow o$  be given. Let  $v1\_xboolean : \iota \Rightarrow o$  be given. Let  $k1\_tarski : \iota \Rightarrow \iota$  be given. Let  $k4\_tarski : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Assume the following.

$$\forall X0.(v1\_xboole\_0 X0) \Rightarrow (X0 = k1\_xboole\_0) \quad (1)$$

Assume the following.

$$\begin{aligned} & \forall X0.((\neg v1\_xboole\_0 X0) \wedge (v7\_ordinal1 X0)) \Rightarrow (\forall X1. \\ & ((v3\_card\_1 X1 X0) \wedge (m2\_finseq\_1 X1 k6\_margrel1)) \Rightarrow (\forall X2. \\ & ((v3\_card\_1 X2 X0) \wedge (m2\_finseq\_1 X2 k6\_margrel1)) \Rightarrow ((k6\_binarith \\ & X0 X1 = k6\_binarith X0 X2) \Rightarrow (X1 = X2)))) \quad (2) \end{aligned}$$

Assume the following.

$$\begin{aligned} & \forall X0.((\neg v1\_xboole\_0 X0) \wedge (v7\_ordinal1 X0)) \Rightarrow (\forall X1. \\ & ((v3\_card\_1 X1 X0) \wedge (m2\_finseq\_1 X1 k6\_margrel1)) \Rightarrow (\forall X2. \\ & ((v3\_card\_1 X2 X0) \wedge (m2\_finseq\_1 X2 k6\_margrel1)) \Rightarrow ((r1\_binarith \\ & X0 X1 X2) \Rightarrow (k6\_binarith X0 (k7\_binarith X0 X1 X2) = k2\_nat\_1 (k6\_binarith \\ & X0 X1) (k6\_binarith X0 X2)))) \quad (3) \end{aligned}$$

Assume the following.

$$m1\_subset\_1 \ k1\_xboole\_0 \ k4\_ordinal1 \quad (4)$$

Assume the following.

$$\forall X0.(v1\_xcmplx\_0 \ X0) \Rightarrow (k2\_xcmplx\_0 \ X0 \ k6\_numbers = X0) \quad (5)$$

Assume the following.

$$\begin{aligned} \forall X0.((v3\_card\_1 \ X0 \ np\_1) \wedge (m2\_finseq\_1 \ X0 \ k6\_margrel1)) \Rightarrow \\ ((X0 = k12\_finseq\_1 \ k6\_margrel1 \ k8\_margrel1) \Rightarrow (k6\_binarith \ np\_1 \\ X0 = np\_1)) \end{aligned} \quad (6)$$

Assume the following.

$$\begin{aligned} \forall X0.((v3\_card\_1 \ X0 \ np\_1) \wedge (m2\_finseq\_1 \ X0 \ k6\_margrel1)) \Rightarrow \\ ((X0 = k12\_finseq\_1 \ k6\_margrel1 \ k7\_margrel1) \Rightarrow (k6\_binarith \ np\_1 \\ X0 = k6\_numbers)) \end{aligned} \quad (7)$$

Assume the following.

$$\begin{aligned} \forall X0.((v3\_card\_1 \ X0 \ np\_1) \wedge (m2\_finseq\_1 \ X0 \ k6\_margrel1)) \Rightarrow \\ ((X0 = k12\_finseq\_1 \ k6\_margrel1 \ k7\_margrel1) \vee (X0 = k12\_finseq\_1 \\ k6\_margrel1 \ k8\_margrel1)) \end{aligned} \quad (8)$$

Assume the following.

$$\begin{aligned} \forall X0.(m1\_subset\_1 \ X0 \ k6\_margrel1) \Rightarrow (\forall X1.(m1\_subset\_1 \\ X1 \ k6\_margrel1) \Rightarrow ((k8\_binarith \ np\_1 \ (k10\_binarith \ k6\_margrel1 \\ X0) \ (k10\_binarith \ k6\_margrel1 \ X1) = k8\_margrel1) \Leftrightarrow ((X0 = k8\_margrel1) \wedge \\ (X1 = k8\_margrel1)))) \end{aligned} \quad (9)$$

Assume the following.

$$\begin{aligned} ((v2\_xxreal\_0 \ np\_1) \wedge (m2\_subset\_1 \ np\_1 \ k1\_numbers \ k5\_numbers)) \wedge \\ ((m1\_subset\_1 \ np\_1 \ k5\_numbers) \wedge (m1\_subset\_1 \ np\_1 \ k1\_numbers)) \end{aligned} \quad (10)$$

Assume the following.

$$\neg v1\_xboole\_0 \ np\_1 \quad (11)$$

Assume the following.

$$\forall X0.\forall X1.((v1\_xcmplx\_0 \ X0) \wedge (v1\_xcmplx\_0 \ X1)) \Rightarrow (k2\_xcmplx\_0 \ X0 \ (k4\_xcmplx\_0 \ X1) = k6\_xcmplx\_0 \ X0 \ X1) \quad (12)$$

Assume the following.

$$v1\_xboole\_0 \ np\_0 \quad (13)$$

Assume the following.

$$\forall X0.\forall X1.(m2\_finseq\_1 \ X1 \ X0) \Leftrightarrow (m1\_finseq\_1 \ X1 \ X0) \quad (14)$$

Assume the following.

$$k8\_margrel1 = k2\_xboolean \quad (15)$$

Assume the following.

$$k7\_margrel1 = k1\_xboolean \quad (16)$$

Assume the following.

$$k6\_numbers = k1\_xboole_0 \quad (17)$$

Assume the following.

$$k5\_numbers = k4\_ordinal1 \quad (18)$$

Assume the following.

$$\forall X0.\forall X1.((m1\_subset_1 X0 k5\_numbers)\wedge(v7\_ordinal1 X1))\Rightarrow(k2\_nat_1 X0 X1 = k2\_xcmplx_0 X0 X1) \quad (19)$$

Assume the following.

$$\forall X0.\forall X1.((\neg v1\_xboole_0 X0)\wedge(m1\_subset_1 X1 X0))\Rightarrow(k12\_finseq_1 X0 X1 = k5\_finseq_1 X1) \quad (20)$$

Assume the following.

$$\forall X0.\forall X1.((\neg v1\_xboole_0 X0)\wedge(m1\_subset_1 X1 X0))\Rightarrow(k10\_binarith X0 X1 = k5\_finseq_1 X1) \quad (21)$$

Assume the following.

$$\forall X0.(v1\_xcmplx_0 X0)\Rightarrow(k4\_xcmplx_0 (k4\_xcmplx_0 X0) = X0) \quad (22)$$

Assume the following.

$$\forall X0.(v1\_xreal_0 X0)\Rightarrow((v1\_xcmplx_0 (k4\_xcmplx_0 X0))\wedge(v1\_xreal_0 (k4\_xcmplx_0 X0))) \quad (23)$$

Assume the following.

$$v1\_xboolean k2\_xboolean \quad (24)$$

Assume the following.

$$\neg v1\_xboole_0 k6\_margrel1 \quad (25)$$

Assume the following.

$$v1\_xboolean k1\_xboolean \quad (26)$$

Assume the following.

$$m1\_subset_1 k8\_margrel1 k6\_margrel1 \quad (27)$$

Assume the following.

$$\forall X0.\forall X1.\forall X2.(((\neg v1\_xboole\_0 X0)\wedge(v7\_ordinal1 X0))\wedge(((v3\_card\_1 X1 X0)\wedge(m1\_finseq\_1 X1 k6\_margrel1))\wedge((v3\_card\_1 X2 X0)\wedge(m1\_finseq\_1 X2 k6\_margrel1))))\Rightarrow(m1\_subset\_1 (k8\_binarith X0 X1 X2) k6\_margrel1) \quad (28)$$

Assume the following.

$$m1\_subset\_1 k7\_margrel1 k6\_margrel1 \quad (29)$$

Assume the following.

$$\forall X0.\forall X1.\forall X2.(((\neg v1\_xboole\_0 X0)\wedge(v7\_ordinal1 X0))\wedge(((v3\_card\_1 X1 X0)\wedge(m1\_finseq\_1 X1 k6\_margrel1))\wedge((v3\_card\_1 X2 X0)\wedge(m1\_finseq\_1 X2 k6\_margrel1))))\Rightarrow((v3\_card\_1 (k7\_binarith X0 X1 X2) X0)\wedge(m2\_finseq\_1 (k7\_binarith X0 X1 X2) k6\_margrel1)) \quad (30)$$

Assume the following.

$$\forall X0.\forall X1.((\neg v1\_xboole\_0 X0)\wedge(m1\_subset\_1 X1 X0))\Rightarrow((v3\_card\_1 (k10\_binarith X0 X1) np\_1)\wedge(m2\_finseq\_1 (k10\_binarith X0 X1) X0)) \quad (31)$$

Assume the following.

$$\forall X0.((\neg v1\_xboole\_0 X0)\wedge(v7\_ordinal1 X0))\Rightarrow(\forall X1.((v3\_card\_1 X1 X0)\wedge(m2\_finseq\_1 X1 k6\_margrel1))\Rightarrow(\forall X2.((v3\_card\_1 X2 X0)\wedge(m2\_finseq\_1 X2 k6\_margrel1))\Rightarrow((r1\_binarith X0 X1 X2)\Leftrightarrow(k8\_binarith X0 X1 X2 = k7\_margrel1)))) \quad (32)$$

Assume the following.

$$\forall X0.k5\_finseq\_1 X0 = k1\_tarski (k4\_tarski np\_1 X0) \quad (33)$$

Assume the following.

$$\forall X0.(v1\_xboolean X0)\Leftrightarrow((X0 = k1\_xboolean)\vee(X0 = k2\_xboolean)) \quad (34)$$

Assume the following.

$$k2\_xboolean = np\_1 \quad (35)$$

Assume the following.

$$k1\_xboolean = k6\_numbers \quad (36)$$

Assume the following.

$$\forall X0.\forall X1.((v1\_xcmplx\_0 X0)\wedge(v1\_xcmplx\_0 X1))\Rightarrow(k2\_xcmplx\_0 X0 X1 = k2\_xcmplx\_0 X1 X0) \quad (37)$$

Assume the following.

$$\forall X0.(v1\_xreal\_0 X0)\Rightarrow(v1\_xcmplx\_0 X0) \quad (38)$$

Assume the following.

$$\forall X0.(v7\_ordinal1 X0)\Rightarrow(v1\_xreal\_0 X0) \quad (39)$$

Assume the following.

$$\forall X0.(m1\_subset\_1 X0 k6\_margrel1)\Rightarrow(v1\_xboolean X0) \quad (40)$$

Assume the following.

$$\forall X0.(m1\_subset\_1 X0 k1\_numbers)\Rightarrow(v1\_xreal\_0 X0) \quad (41)$$

Assume the following.

$$\forall X0.(v1\_xboolean X0)\Rightarrow(v7\_ordinal1 X0) \quad (42)$$

**Theorem 1**

$$(k7\_binarith np\_1 (k10\_binarith k6\_margrel1 k7\_margrel1) (k10\_binarith k6\_margrel1 k8\_margrel1) = k10\_binarith k6\_margrel1 k8\_margrel1)\wedge (k7\_binarith np\_1 (k10\_binarith k6\_margrel1 k8\_margrel1) (k10\_binarith k6\_margrel1 k7\_margrel1) = k10\_binarith k6\_margrel1 k8\_margrel1)$$