

t30\_xboolean (TM-  
FemA7ZaKyq7Nk69Ug1gGNAf4GA5T7J2GK)

October 27, 2020

Let  $v1\_xboolean : \iota \Rightarrow o$  be given. Let  $k6\_xboolean : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k7\_xboolean : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k4\_xboolean : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k5\_xboolean : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k3\_xboolean : \iota \Rightarrow \iota$  be given. Let  $v1\_xboole\_0 : \iota \Rightarrow o$  be given. Let  $k1\_xboole\_0 : \iota$  be given. Let  $np\_0 : \iota$  be given. Let  $k3\_xcmplx\_0 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $np\_1 : \iota$  be given. Let  $k6\_xcmplx\_0 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k6\_numbers : \iota$  be given. Let  $k2\_xboolean : \iota$  be given. Let  $k1\_xboolean : \iota$  be given. Assume the following.

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

Assume the following.

$$\forall X0.(v1\_xboolean X0) \Rightarrow (\forall X1.(v1\_xboolean X1) \Rightarrow (k5\_xboolean X0 (k4\_xboolean X0 X1) = X0)) \quad (2)$$

Assume the following.

$$\forall X0.(v1\_xboolean X0) \Rightarrow (\forall X1.(v1\_xboolean X1) \Rightarrow (k5\_xboolean X0 (k7\_xboolean X0 X1) = k6\_xboolean X1 X0)) \quad (3)$$

Assume the following.

$$\forall X0.(v1\_xboolean X0) \Rightarrow (\forall X1.(v1\_xboolean X1) \Rightarrow (k6\_xboolean X0 (k4\_xboolean X0 X1) = k6\_xboolean X0 X1)) \quad (4)$$

Assume the following.

$$v1\_xboole\_0 np\_0 \quad (5)$$

Assume the following.

$$k3\_xcmplx\_0 np\_1 np\_1 = np\_1 \quad (6)$$

Assume the following.

$$k3\_xcmplx\_0 np\_0 np\_1 = np\_0 \quad (7)$$

Assume the following.

$$k3\_xcmplx\_0 \ np\_0 \ np\_0 = np\_0 \quad (8)$$

Assume the following.

$$k6\_xcmplx\_0 \ np\_1 \ np\_0 = np\_1 \quad (9)$$

Assume the following.

$$k6\_numbers = k1\_xboole\_0 \quad (10)$$

Assume the following.

$$\forall X0.(v1\_xboolean \ X0) \Rightarrow (k3\_xboolean \ (k3\_xboolean \ X0) = X0) \quad (11)$$

Assume the following.

$$\forall X0.\forall X1.((v1\_xboolean \ X0) \wedge (v1\_xboolean \ X1)) \Rightarrow (v1\_xboolean \ (k6\_xboolean \ X0 \ X1)) \quad (12)$$

Assume the following.

$$\forall X0.\forall X1.((v1\_xboolean \ X0) \wedge (v1\_xboolean \ X1)) \Rightarrow (v1\_xboolean \ (k4\_xboolean \ X0 \ X1)) \quad (13)$$

Assume the following.

$$v1\_xboolean \ k2\_xboolean \quad (14)$$

Assume the following.

$$v1\_xboolean \ k1\_xboolean \quad (15)$$

Assume the following.

$$\forall X0.(v1\_xboolean \ X0) \Rightarrow (v1\_xboolean \ (k3\_xboolean \ X0)) \quad (16)$$

Assume the following.

$$\forall X0.(v1\_xboolean \ X0) \Rightarrow (\forall X1.(v1\_xboolean \ X1) \Rightarrow (k7\_xboolean \ X0 \ X1 = k4\_xboolean \ (k6\_xboolean \ X0 \ X1) \ (k6\_xboolean \ X1 \ X0))) \quad (17)$$

Assume the following.

$$\forall X0.(v1\_xboolean \ X0) \Rightarrow (\forall X1.(v1\_xboolean \ X1) \Rightarrow (k6\_xboolean \ X0 \ X1 = k5\_xboolean \ (k3\_xboolean \ X0) \ X1)) \quad (18)$$

Assume the following.

$$\forall X0.(v1\_xboolean \ X0) \Rightarrow (\forall X1.(v1\_xboolean \ X1) \Rightarrow (k4\_xboolean \ X0 \ X1 = k3\_xcmplx\_0 \ X0 \ X1)) \quad (19)$$

Assume the following.

$$\forall X0.(v1\_xboolean\ X0)\Rightarrow(k3\_xboolean\ X0 = k6\_xcmplx\_0\ np\_1\ X0) \quad (20)$$

Assume the following.

$$\forall X0.(v1\_xboolean\ X0)\Leftrightarrow((X0 = k1\_xboolean)\vee(X0 = k2\_xboolean)) \quad (21)$$

Assume the following.

$$k2\_xboolean = np\_1 \quad (22)$$

Assume the following.

$$k1\_xboolean = k6\_numbers \quad (23)$$

Assume the following.

$$\forall X0.\forall X1.((v1\_xboolean\ X0)\wedge(v1\_xboolean\ X1))\Rightarrow(k7\_xboolean\ X0\ X1 = k7\_xboolean\ X1\ X0) \quad (24)$$

Assume the following.

$$\forall X0.\forall X1.((v1\_xboolean\ X0)\wedge(v1\_xboolean\ X1))\Rightarrow(k5\_xboolean\ X0\ X1 = k5\_xboolean\ X1\ X0) \quad (25)$$

Assume the following.

$$\forall X0.\forall X1.((v1\_xboolean\ X0)\wedge(v1\_xboolean\ X1))\Rightarrow(k4\_xboolean\ X0\ X1 = k4\_xboolean\ X1\ X0) \quad (26)$$

**Theorem 1**

$$\begin{aligned} & \forall X0.(v1\_xboolean\ X0)\Rightarrow(\forall X1.(v1\_xboolean\ X1)\Rightarrow(\forall X2. \\ & (v1\_xboolean\ X2)\Rightarrow(k6\_xboolean\ X0\ (k7\_xboolean\ X1\ X2) = k4\_xboolean \\ & (k5\_xboolean\ (k5\_xboolean\ (k3\_xboolean\ X0)\ (k3\_xboolean\ X1)) \\ & X2)\ (k5\_xboolean\ (k5\_xboolean\ (k3\_xboolean\ X0)\ X1)\ (k3\_xboolean \\ & X2)))))) \end{aligned}$$