

t12\_xboolean  
(TMUPK2AKuqriK56XVJs6EHeg3chaL2NHvz)

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Let  $v1\_xboolean : \iota \Rightarrow o$  be given. Let  $k5\_xboolean : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k4\_xboolean : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k3\_xboolean : \iota \Rightarrow \iota$  be given. Assume the following.

$$\forall X0.(v1\_xboolean X0) \Rightarrow (\forall X1.(v1\_xboolean X1) \Rightarrow (k4\_xboolean X0 (k5\_xboolean X0 X1) = X0)) \quad (1)$$

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.

$$\forall X0.(v1\_xboolean X0) \Rightarrow (\forall X1.(v1\_xboolean X1) \Rightarrow (k4\_xboolean X0 (k5\_xboolean (k3\_xboolean X0) X1) = k4\_xboolean X0 X1)) \quad (3)$$

Assume the following.

$$\forall X0.(v1\_xboolean X0) \Rightarrow (k3\_xboolean (k3\_xboolean X0) = X0) \quad (4)$$

Assume the following.

$$\forall X0.\forall X1.((v1\_xboolean X0) \wedge (v1\_xboolean X1)) \Rightarrow (v1\_xboolean (k5\_xboolean X0 X1)) \quad (5)$$

Assume the following.

$$\forall X0.\forall X1.((v1\_xboolean X0) \wedge (v1\_xboolean X1)) \Rightarrow (v1\_xboolean (k4\_xboolean X0 X1)) \quad (6)$$

Assume the following.

$$\forall X0.(v1\_xboolean X0) \Rightarrow (v1\_xboolean (k3\_xboolean X0)) \quad (7)$$

Assume the following.

$$\forall X0.(v1\_xboolean\ X0) \Rightarrow (\forall X1.(v1\_xboolean\ X1) \Rightarrow (k5\_xboolean\ X0\ X1 = k3\_xboolean\ (k4\_xboolean\ (k3\_xboolean\ X0)\ (k3\_xboolean\ X1)))) \quad (8)$$

Assume the following.

$$\forall X0.\forall X1.((v1\_xboolean\ X0) \wedge (v1\_xboolean\ X1)) \Rightarrow (k5\_xboolean\ X0\ X1 = k5\_xboolean\ X1\ X0) \quad (9)$$

Assume the following.

$$\forall X0.\forall X1.((v1\_xboolean\ X0) \wedge (v1\_xboolean\ X1)) \Rightarrow (k4\_xboolean\ X0\ X1 = k4\_xboolean\ X1\ X0) \quad (10)$$

**Theorem 1**

$$\forall X0.(v1\_xboolean\ X0) \Rightarrow (\forall X1.(v1\_xboolean\ X1) \Rightarrow (k5\_xboolean\ X0\ (k4\_xboolean\ (k3\_xboolean\ X0)\ X1) = k5\_xboolean\ X0\ X1))$$