

t54\_xboolean  
(TMPKb5vAaMuErRYDhHbB8MGTqyDwpqtauJX)

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Let  $v1\_xboolean : \iota \Rightarrow o$  be given. Let  $k8\_xboolean : \iota \Rightarrow \iota \Rightarrow \iota$  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. Assume the following.

$$\begin{aligned} & \forall X0.(v1\_xboolean X0) \Rightarrow (\forall X1.(v1\_xboolean X1) \Rightarrow (\forall X2. \\ & (v1\_xboolean X2) \Rightarrow (k5\_xboolean X0 (k4\_xboolean X1 X2) = k4\_xboolean \\ & (k5\_xboolean X0 X1) (k5\_xboolean X0 X2)))) \end{aligned} \quad (1)$$

Assume the following.

$$\forall X0.(v1\_xboolean X0) \Rightarrow (k3\_xboolean (k3\_xboolean X0) = X0) \quad (2)$$

Assume the following.

$$\forall X0.\forall X1.((v1\_xboolean X0) \wedge (v1\_xboolean X1)) \Rightarrow (v1\_xboolean (k4\_xboolean X0 X1)) \quad (3)$$

Assume the following.

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

Assume the following.

$$\forall X0.(v1\_xboolean X0) \Rightarrow (\forall X1.(v1\_xboolean X1) \Rightarrow (k8\_xboolean X0 X1 = k3\_xboolean (k4\_xboolean X0 X1))) \quad (5)$$

Assume the following.

$$\forall X0.(v1\_xboolean X0) \Rightarrow (\forall X1.(v1\_xboolean X1) \Rightarrow (k5\_xboolean X0 X1 = k3\_xboolean (k4\_xboolean (k3\_xboolean X0) (k3\_xboolean X1)))) \quad (6)$$

**Theorem 1**

$$\begin{aligned} & \forall X0.(v1\_xboolean X0) \Rightarrow (\forall X1.(v1\_xboolean X1) \Rightarrow (\forall X2. \\ & (v1\_xboolean X2) \Rightarrow (k8\_xboolean X0 (k8\_xboolean X1 X2) = k4\_xboolean \\ & (k5\_xboolean (k3\_xboolean X0) X1) (k5\_xboolean (k3\_xboolean X0) \\ & X2)))) \end{aligned}$$