

t2\_gate\_2  
 (TMRT2ewf1s43SSVaSo4PyYnGmiF9xjegFxFxG)

October 27, 2020

Let  $v1\_xboole\_0 : \iota \Rightarrow o$  be given. Let  $k8\_gate\_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k2\_gate\_1 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Assume the following.

$$\forall X0. \forall X1. (\neg v1\_xboole\_0 (k2\_gate\_1 X0 X1)) \Leftrightarrow ((\neg v1\_xboole\_0 X0) \wedge (\neg v1\_xboole\_0 X1)) \quad (1)$$

Assume the following.

$$\forall X0. \forall X1. \forall X2. (\neg v1\_xboole\_0 (k8\_gate\_1 X0 X1 X2)) \Leftrightarrow ((\neg v1\_xboole\_0 X0) \wedge ((\neg v1\_xboole\_0 X1) \wedge (\neg v1\_xboole\_0 X2))) \quad (2)$$

Assume the following.

$$\forall X0. \forall X1. k2\_gate\_1 X0 X1 = k2\_gate\_1 X1 X0 \quad (3)$$

**Theorem 1**

$$\forall X0. \forall X1. \forall X2. \forall X3. (\neg(\neg v1\_xboole\_0 (k8\_gate\_1 (k2\_gate\_1 X0 X1) (k2\_gate\_1 X2 X1) (k2\_gate\_1 X3 X1)))) \wedge (v1\_xboole\_0 (k2\_gate\_1 (k8\_gate\_1 X0 X2 X3) X1))) \wedge (\neg(\neg v1\_xboole\_0 (k2\_gate\_1 (k8\_gate\_1 X0 X2 X3) X1))) \wedge (v1\_xboole\_0 (k8\_gate\_1 (k2\_gate\_1 X0 X1) (k2\_gate\_1 X2 X1) (k2\_gate\_1 X3 X1))))$$