

t2_gate_3 (TMd- bYR1usLT5AxiuTVa3M4eGGRkd9CVTEf6)

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Let $v1_xboole_0 : \iota \Rightarrow o$ be given. Let $k2_gate_1 : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k1_gate_1 : \iota \Rightarrow \iota$ be given. Let $k3_gate_1 : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k8_gate_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Assume the following.

$$\forall X0. \forall X1. (\neg(\neg v1_xboole_0 (k3_gate_1 X0 X1)) \wedge ((v1_xboole_0 X0) \wedge (v1_xboole_0 X1))) \wedge (\neg(\neg(v1_xboole_0 X0) \wedge (v1_xboole_0 X1)) \wedge (v1_xboole_0 (k3_gate_1 X0 X1))) \quad (1)$$

Assume the following.

$$\forall X0. \forall X1. (\neg v1_xboole_0 (k2_gate_1 X0 X1)) \Leftrightarrow ((\neg v1_xboole_0 X0) \wedge (\neg v1_xboole_0 X1)) \quad (2)$$

Assume the following.

$$\forall X0. \forall X1. \forall X2. \forall X3. (\neg(v1_xboole_0 (k2_gate_1 X0 X1)) \wedge (v1_xboole_0 (k3_gate_1 (k1_gate_1 X0 X1)))) \wedge (((\neg v1_xboole_0 (k3_gate_1 (k1_gate_1 X0 X1))) \Rightarrow (v1_xboole_0 (k2_gate_1 X0 X1))) \wedge (\neg(\neg v1_xboole_0 (k3_gate_1 X0 X1)) \wedge (\neg v1_xboole_0 (k3_gate_1 X2 X1)) \wedge (v1_xboole_0 (k3_gate_1 (k2_gate_1 X0 X2) X1)))) \wedge (((\neg v1_xboole_0 (k3_gate_1 (k2_gate_1 X0 X2) X1)) \Rightarrow ((\neg v1_xboole_0 (k3_gate_1 X0 X1)) \wedge (\neg v1_xboole_0 (k3_gate_1 X2 X1)))) \wedge ((\neg(\neg v1_xboole_0 (k3_gate_1 X0 X1)) \wedge (\neg v1_xboole_0 (k3_gate_1 X2 X1)) \wedge (\neg v1_xboole_0 (k3_gate_1 X3 X1)) \wedge (v1_xboole_0 (k3_gate_1 (k8_gate_1 X0 X2 X3) X1)))) \wedge (((\neg v1_xboole_0 (k3_gate_1 (k8_gate_1 X0 X2 X3) X1)) \Rightarrow ((\neg v1_xboole_0 (k3_gate_1 X0 X1)) \wedge ((\neg v1_xboole_0 (k3_gate_1 X2 X1)) \wedge (\neg v1_xboole_0 (k3_gate_1 X3 X1)))))) \wedge (\neg(\neg v1_xboole_0 (k3_gate_1 X0 X1)) \wedge (\neg(\neg v1_xboole_0 X0) \wedge (v1_xboole_0 X2)) \wedge (\neg(\neg v1_xboole_0 X2) \wedge (v1_xboole_0 X0)) \wedge (v1_xboole_0 (k3_gate_1 X2 X1))))))))) \quad (3)$$

Assume the following.

$$\forall X0. (\neg v1_xboole_0 X0) \Rightarrow (v1_xboole_0 (k1_gate_1 X0)) \quad (4)$$

Assume the following.

$$\forall X0.(v1_xboole_0 X0) \Rightarrow (\neg v1_xboole_0 (k1_gate_1 X0)) \quad (5)$$

Assume the following.

$$\forall X0.\forall X1.k3_gate_1 X0 X1 = k3_gate_1 X1 X0 \quad (6)$$

Assume the following.

$$\forall X0.\forall X1.k2_gate_1 X0 X1 = k2_gate_1 X1 X0 \quad (7)$$

Theorem 1

$$\begin{aligned} & \forall X0.\forall X1.\forall X2.\forall X3.\forall X4.\forall X5. \\ & \forall X6.\forall X7.\forall X8.\forall X9.\forall X10.\forall X11. \\ & \forall X12.\neg(\neg(\neg v1_xboole_0 X0) \wedge (v1_xboole_0 (k2_gate_1 (k1_gate_1 \\ & \quad X9) (k1_gate_1 X8)))) \wedge ((\neg(\neg v1_xboole_0 (k2_gate_1 (k1_gate_1 \\ & \quad X9) (k1_gate_1 X8))) \wedge (v1_xboole_0 X0)) \wedge ((\neg(\neg v1_xboole_0 X1) \wedge \\ & \quad (v1_xboole_0 (k2_gate_1 (k1_gate_1 X9) X8))) \wedge ((\neg(\neg v1_xboole_0 \\ & \quad (k2_gate_1 (k1_gate_1 X9) X8)) \wedge (v1_xboole_0 X1)) \wedge ((\neg(\neg v1_xboole_0 \\ & \quad X2) \wedge (v1_xboole_0 (k2_gate_1 X9 (k1_gate_1 X8)))) \wedge ((\neg(\neg v1_xboole_0 \\ & \quad (k2_gate_1 X9 (k1_gate_1 X8))) \wedge (v1_xboole_0 X2)) \wedge ((\neg(\neg v1_xboole_0 \\ & \quad X3) \wedge (v1_xboole_0 (k2_gate_1 X9 X8))) \wedge ((\neg(\neg v1_xboole_0 (k2_gate_1 \\ & \quad X9 X8)) \wedge (v1_xboole_0 X3)) \wedge ((\neg(\neg v1_xboole_0 X4) \wedge (v1_xboole_0 \\ & \quad (k2_gate_1 (k1_gate_1 X11) (k1_gate_1 X10)))) \wedge ((\neg(\neg v1_xboole_0 \\ & \quad (k2_gate_1 (k1_gate_1 X11) (k1_gate_1 X10))) \wedge (v1_xboole_0 X4)) \wedge \\ & \quad ((\neg(\neg v1_xboole_0 X5) \wedge (v1_xboole_0 (k2_gate_1 (k1_gate_1 X11) \\ & \quad X10)))) \wedge ((\neg(\neg v1_xboole_0 (k2_gate_1 (k1_gate_1 X11) X10)) \wedge (v1_xboole_0 \\ & \quad X5)) \wedge ((\neg(\neg v1_xboole_0 X6) \wedge (v1_xboole_0 (k2_gate_1 X11 (k1_gate_1 \\ & \quad X10)))) \wedge ((\neg(\neg v1_xboole_0 (k2_gate_1 X11 (k1_gate_1 X10))) \wedge (\\ & \quad v1_xboole_0 X6)) \wedge ((\neg(\neg v1_xboole_0 X7) \wedge (v1_xboole_0 (k2_gate_1 \\ & \quad X11 X10))) \wedge ((\neg(\neg v1_xboole_0 (k2_gate_1 X11 X10)) \wedge (v1_xboole_0 \\ & \quad X7)) \wedge ((\neg(\neg v1_xboole_0 X10) \wedge (v1_xboole_0 (k2_gate_1 (k1_gate_1 \\ & \quad X9) X12))) \wedge ((\neg(\neg v1_xboole_0 (k2_gate_1 (k1_gate_1 X9) X12)) \wedge \\ & \quad (v1_xboole_0 X10)) \wedge ((\neg(\neg v1_xboole_0 X11) \wedge (v1_xboole_0 (k2_gate_1 \\ & \quad X8 X12))) \wedge ((\neg(\neg v1_xboole_0 (k2_gate_1 X8 X12)) \wedge (v1_xboole_0 \\ & \quad X11)) \wedge (\neg(\neg(\neg v1_xboole_0 X5) \wedge (v1_xboole_0 (k2_gate_1 X0 X12)))) \wedge \\ & \quad ((\neg(\neg v1_xboole_0 (k2_gate_1 X0 X12)) \wedge (v1_xboole_0 X5)) \wedge ((\neg(\\ & \quad \neg v1_xboole_0 X7) \wedge (v1_xboole_0 (k2_gate_1 X1 X12))) \wedge ((\neg(\neg v1_xboole_0 \\ & \quad (k2_gate_1 X1 X12)) \wedge (v1_xboole_0 X7)) \wedge ((\neg(\neg v1_xboole_0 X6) \wedge \\ & \quad (v1_xboole_0 (k2_gate_1 X3 X12))) \wedge ((\neg(\neg v1_xboole_0 (k2_gate_1 \\ & \quad X3 X12)) \wedge (v1_xboole_0 X6)) \wedge ((\neg(\neg v1_xboole_0 X4) \wedge (v1_xboole_0 \\ & \quad (k3_gate_1 (k2_gate_1 X2 X12) (k1_gate_1 X12)))) \wedge (\neg(\neg v1_xboole_0 \\ & \quad (k3_gate_1 (k2_gate_1 X2 X12) (k1_gate_1 X12))) \wedge (v1_xboole_0 \\ & \quad X4)) \end{aligned}$$