

# t4\_gate\_5 (TMVpx- AxKaM6XLCYBqS9rVjA7AiX5fkPRRhf)

October 27, 2020

Let  $v1\_xboole\_0 : \iota \Rightarrow o$  be given. Let  $k2\_gate\_1 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k10\_gate\_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k1\_xboole\_0 : \iota$  be given. Let  $k11\_gate\_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k14\_gate\_5 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k16\_gate\_5 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k17\_gate\_5 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k5\_gate\_5 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k6\_gate\_5 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k10\_gate\_5 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k11\_gate\_5 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k12\_gate\_5 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k13\_gate\_5 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k3\_gate\_1 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k9\_gate\_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k8\_gate\_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k9\_gate\_5 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k38\_gate\_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k8\_gate\_5 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k37\_gate\_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k7\_gate\_5 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k35\_gate\_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k36\_gate\_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k15\_gate\_5 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Assume the following.

$$\forall X0.\forall X1.((v1\_xboole\_0 X0)\wedge(v1\_xboole\_0 X1))\Rightarrow(v1\_xboole\_0 (k3\_gate\_1 X0 X1)) \quad (1)$$

Assume the following.

$$\forall X0.\forall X1.(\neg v1\_xboole\_0 X1)\Rightarrow(\neg v1\_xboole\_0 (k3\_gate\_1 X0 X1)) \quad (2)$$

Assume the following.

$$\forall X0.\forall X1.(v1\_xboole\_0 X0)\Rightarrow(v1\_xboole\_0 (k2\_gate\_1 X0 X1)) \quad (3)$$

Assume the following.

$$\forall X0.\forall X1.((\neg v1\_xboole\_0 X0)\wedge(\neg v1\_xboole\_0 X1))\Rightarrow(\neg v1\_xboole\_0 (k2\_gate\_1 X0 X1)) \quad (4)$$

Assume the following.

$$\forall X0.\forall X1.\forall X2.((v1\_xboole\_0 X0)\wedge(v1\_xboole\_0 X1))\Rightarrow(v1\_xboole\_0 (k11\_gate\_1 X2 X0 X1)) \quad (5)$$

Assume the following.

$$\forall X0.\forall X1.\forall X2.((v1\_xboole\_0 X0)\wedge(v1\_xboole\_0 X1))\Rightarrow(v1\_xboole\_0 (k11\_gate\_1 X0 X2 X1)) \quad (6)$$

Assume the following.

$$\forall X0.\forall X1.\forall X2.((v1\_xboole\_0 X0)\wedge(v1\_xboole\_0 X1))\Rightarrow(v1\_xboole\_0 (k11\_gate\_1 X0 X1 X2)) \quad (7)$$

Assume the following.

$$\forall X0.\forall X1.\forall X2.((\neg v1\_xboole\_0 X0)\wedge(\neg v1\_xboole\_0 X1))\Rightarrow(\neg v1\_xboole\_0 (k11\_gate\_1 X2 X0 X1)) \quad (8)$$

Assume the following.

$$\forall X0.\forall X1.\forall X2.((\neg v1\_xboole\_0 X0)\wedge(\neg v1\_xboole\_0 X1))\Rightarrow(\neg v1\_xboole\_0 (k11\_gate\_1 X0 X2 X1)) \quad (9)$$

Assume the following.

$$\forall X0.\forall X1.\forall X2.((\neg v1\_xboole\_0 X0)\wedge(\neg v1\_xboole\_0 X1))\Rightarrow(\neg v1\_xboole\_0 (k11\_gate\_1 X0 X1 X2)) \quad (10)$$

Assume the following.

$$\forall X0.\forall X1.\forall X2.((\neg v1\_xboole\_0 X0)\wedge((\neg v1\_xboole\_0 X1)\wedge(\neg v1\_xboole\_0 X2)))\Rightarrow(\neg v1\_xboole\_0 (k10\_gate\_1 X0 X1 X2)) \quad (11)$$

Assume the following.

$$\forall X0.\forall X1.\forall X2.((\neg v1\_xboole\_0 X0)\wedge((\neg v1\_xboole\_0 X1)\wedge(v1\_xboole\_0 X2)))\Rightarrow(v1\_xboole\_0 (k10\_gate\_1 X2 X0 X1)) \quad (12)$$

Assume the following.

$$\forall X0.\forall X1.\forall X2.((\neg v1\_xboole\_0 X0)\wedge((\neg v1\_xboole\_0 X1)\wedge(v1\_xboole\_0 X2)))\Rightarrow(v1\_xboole\_0 (k10\_gate\_1 X0 X2 X1)) \quad (13)$$

Assume the following.

$$\forall X0.\forall X1.\forall X2.((\neg v1\_xboole\_0 X0)\wedge((\neg v1\_xboole\_0 X1)\wedge(v1\_xboole\_0 X2)))\Rightarrow(v1\_xboole\_0 (k10\_gate\_1 X0 X1 X2)) \quad (14)$$

Assume the following.

$$\forall X0.\forall X1.\forall X2.((v1\_xboole\_0 X0)\wedge((v1\_xboole\_0 X1)\wedge(\neg v1\_xboole\_0 X2)))\Rightarrow(\neg v1\_xboole\_0 (k10\_gate\_1 X2 X0 X1)) \quad (15)$$

Assume the following.

$$\forall X0.\forall X1.\forall X2.((v1\_xboole\_0 X0)\wedge((v1\_xboole\_0 X1)\wedge(\neg v1\_xboole\_0 X2)))\Rightarrow(\neg v1\_xboole\_0 (k10\_gate\_1 X0 X2 X1)) \quad (16)$$

Assume the following.

$$\forall X0.\forall X1.\forall X2.((v1\_xboole\_0 X0)\wedge((v1\_xboole\_0 X1)\wedge(\neg v1\_xboole\_0 X2)))\Rightarrow(\neg v1\_xboole\_0 (k10\_gate\_1 X0 X1 X2)) \quad (17)$$

Assume the following.

$$\forall X0.\forall X1.\forall X2.((v1\_xboole\_0 X0)\wedge((v1\_xboole\_0 X1)\wedge(v1\_xboole\_0 X2)))\Rightarrow(v1\_xboole\_0 (k10\_gate\_1 X0 X1 X2)) \quad (18)$$

Assume the following.

$$\forall X0.\forall X1.\forall X2.(\neg v1\_xboole\_0 X0)\Rightarrow(\neg v1\_xboole\_0 (k9\_gate\_1 X1 X0 X2)) \quad (19)$$

Assume the following.

$$\forall X0.\forall X1.\forall X2.(\neg v1\_xboole\_0 X0)\Rightarrow(\neg v1\_xboole\_0 (k9\_gate\_1 X0 X1 X2)) \quad (20)$$

Assume the following.

$$\forall X0.\forall X1.\forall X2.((v1\_xboole\_0 X0)\wedge((v1\_xboole\_0 X1)\wedge(v1\_xboole\_0 X2)))\Rightarrow(v1\_xboole\_0 (k9\_gate\_1 X0 X1 X2)) \quad (21)$$

Assume the following.

$$\forall X0.\forall X1.\forall X2.(v1\_xboole\_0 X0)\Rightarrow(v1\_xboole\_0 (k8\_gate\_1 X1 X2 X0)) \quad (22)$$

Assume the following.

$$v1\_xboole\_0 k1\_xboole\_0 \quad (23)$$

Assume the following.

$$\forall X0.\forall X1.\forall X2.(v1\_xboole\_0 X0)\Rightarrow(v1\_xboole\_0 (k8\_gate\_1 X1 X0 X2)) \quad (24)$$

Assume the following.

$$\forall X0.\forall X1.\forall X2.((\neg v1\_xboole\_0 X0)\wedge((\neg v1\_xboole\_0 X1)\wedge(\neg v1\_xboole\_0 X2)))\Rightarrow(\neg v1\_xboole\_0 (k8\_gate\_1 X0 X1 X2)) \quad (25)$$

Assume the following.

$$\forall X0.\forall X1.\forall X2.\forall X3.\forall X4.k9\_gate\_5 X0 X1 X2 X3 X4 = k38\_gate\_1 (k2\_gate\_1 X1 X3) (k2\_gate\_1 X0 X4) (k2\_gate\_1 X2 X3) (k2\_gate\_1 X1 X4) k1\_xboole\_0 (k2\_gate\_1 X2 X4) k1\_xboole\_0 \quad (26)$$

Assume the following.

$$\begin{aligned} & \forall X0.\forall X1.\forall X2.\forall X3.\forall X4.k8\_gate\_5 \\ X0\ X1\ X2\ X3\ X4 = & k37\_gate\_1 (k2\_gate\_1\ X1\ X3) (k2\_gate\_1\ X0\ X4) (k2\_gate\_1 \\ & X2\ X3) (k2\_gate\_1\ X1\ X4) k1\_xboole\_0 (k2\_gate\_1\ X2\ X4) k1\_xboole\_0 \end{aligned} \quad (27)$$

Assume the following.

$$\begin{aligned} & \forall X0.\forall X1.\forall X2.\forall X3.\forall X4.k7\_gate\_5 \\ X0\ X1\ X2\ X3\ X4 = & k35\_gate\_1 (k2\_gate\_1\ X1\ X3) (k2\_gate\_1\ X0\ X4) (k2\_gate\_1 \\ & X2\ X3) (k2\_gate\_1\ X1\ X4) k1\_xboole\_0 \end{aligned} \quad (28)$$

Assume the following.

$$\begin{aligned} & \forall X0.\forall X1.\forall X2.\forall X3.\forall X4.k6\_gate\_5 \\ X0\ X1\ X2\ X3\ X4 = & k10\_gate\_1 (k2\_gate\_1\ X1\ X3) (k2\_gate\_1\ X0\ X4) k1\_xboole\_0 \end{aligned} \quad (29)$$

Assume the following.

$$\begin{aligned} & \forall X0.\forall X1.\forall X2.\forall X3.\forall X4.k5\_gate\_5 \\ X0\ X1\ X2\ X3\ X4 = & k2\_gate\_1\ X0\ X3 \end{aligned} \quad (30)$$

Assume the following.

$$\begin{aligned} & \forall X0.\forall X1.\forall X2.\forall X3.\forall X4.\forall X5. \\ \forall X6.k38\_gate\_1\ X0\ X1\ X2\ X3\ X4\ X5\ X6 = & k11\_gate\_1\ X4\ X5 (k36\_gate\_1 \\ & X0\ X1\ X2\ X3\ X6) \end{aligned} \quad (31)$$

Assume the following.

$$\begin{aligned} & \forall X0.\forall X1.\forall X2.\forall X3.\forall X4.\forall X5. \\ \forall X6.k37\_gate\_1\ X0\ X1\ X2\ X3\ X4\ X5\ X6 = & k10\_gate\_1\ X4\ X5 (k36\_gate\_1 \\ & X0\ X1\ X2\ X3\ X6) \end{aligned} \quad (32)$$

Assume the following.

$$\begin{aligned} & \forall X0.\forall X1.\forall X2.\forall X3.\forall X4.k36\_gate\_1 \\ X0\ X1\ X2\ X3\ X4 = & k11\_gate\_1\ X2\ X3 (k11\_gate\_1\ X0\ X1\ X4) \end{aligned} \quad (33)$$

Assume the following.

$$\begin{aligned} & \forall X0.\forall X1.\forall X2.\forall X3.\forall X4.k35\_gate\_1 \\ X0\ X1\ X2\ X3\ X4 = & k10\_gate\_1\ X2\ X3 (k11\_gate\_1\ X0\ X1\ X4) \end{aligned} \quad (34)$$

Assume the following.

$$\begin{aligned} & \forall X0.\forall X1.\forall X2.\forall X3.\forall X4.\forall X5. \\ \forall X6.k17\_gate\_5\ X0\ X1\ X2\ X3\ X4\ X5\ X6 = & k9\_gate\_1 (k2\_gate\_1\ X4 \\ & X5) (k2\_gate\_1 (k3\_gate\_1\ X4\ X5) (k2\_gate\_1\ X2\ X3)) (k8\_gate\_1 ( \\ & k3\_gate\_1\ X4\ X5) (k3\_gate\_1\ X2\ X3) (k11\_gate\_1\ X0\ X1\ X6)) \end{aligned} \quad (35)$$

Assume the following.

$$\begin{aligned} & \forall X0.\forall X1.\forall X2.\forall X3.\forall X4.\forall X5. \\ & \forall X6.k16\_gate\_5 X0 X1 X2 X3 X4 X5 X6 = k10\_gate\_1 X4 X5 (k15\_gate\_5 \\ & \quad X0 X1 X2 X3 X6) \end{aligned} \quad (36)$$

Assume the following.

$$\begin{aligned} & \forall X0.\forall X1.\forall X2.\forall X3.\forall X4.k15\_gate\_5 \\ & X0 X1 X2 X3 X4 = k3\_gate\_1 (k2\_gate\_1 X2 X3) (k2\_gate\_1 (k3\_gate\_1 \\ & \quad X2 X3) (k11\_gate\_1 X0 X1 X4)) \end{aligned} \quad (37)$$

Assume the following.

$$\begin{aligned} & \forall X0.\forall X1.\forall X2.\forall X3.\forall X4.k14\_gate\_5 \\ & X0 X1 X2 X3 X4 = k10\_gate\_1 X2 X3 (k11\_gate\_1 X0 X1 X4) \end{aligned} \quad (38)$$

Assume the following.

$$\begin{aligned} & \forall X0.\forall X1.\forall X2.\forall X3.\forall X4.\forall X5. \\ & k13\_gate\_5 X0 X1 X2 X3 X4 X5 = k38\_gate\_1 (k7\_gate\_5 X0 X1 X2 X3 X4) ( \\ & k2\_gate\_1 X0 X5) (k8\_gate\_5 X0 X1 X2 X3 X4) (k2\_gate\_1 X1 X5) (k9\_gate\_5 \\ & \quad X0 X1 X2 X3 X4) (k2\_gate\_1 X2 X5) k1\_xboole\_0 \end{aligned} \quad (39)$$

Assume the following.

$$\begin{aligned} & \forall X0.\forall X1.\forall X2.\forall X3.\forall X4.\forall X5. \\ & k12\_gate\_5 X0 X1 X2 X3 X4 X5 = k37\_gate\_1 (k7\_gate\_5 X0 X1 X2 X3 X4) ( \\ & k2\_gate\_1 X0 X5) (k8\_gate\_5 X0 X1 X2 X3 X4) (k2\_gate\_1 X1 X5) (k9\_gate\_5 \\ & \quad X0 X1 X2 X3 X4) (k2\_gate\_1 X2 X5) k1\_xboole\_0 \end{aligned} \quad (40)$$

Assume the following.

$$\begin{aligned} & \forall X0.\forall X1.\forall X2.\forall X3.\forall X4.\forall X5. \\ & k11\_gate\_5 X0 X1 X2 X3 X4 X5 = k35\_gate\_1 (k7\_gate\_5 X0 X1 X2 X3 X4) ( \\ & k2\_gate\_1 X0 X5) (k8\_gate\_5 X0 X1 X2 X3 X4) (k2\_gate\_1 X1 X5) k1\_xboole\_0 \end{aligned} \quad (41)$$

Assume the following.

$$\begin{aligned} & \forall X0.\forall X1.\forall X2.\forall X3.\forall X4.\forall X5. \\ & k10\_gate\_5 X0 X1 X2 X3 X4 X5 = k10\_gate\_1 (k7\_gate\_5 X0 X1 X2 X3 X4) ( \\ & \quad k2\_gate\_1 X0 X5) k1\_xboole\_0 \end{aligned} \quad (42)$$

Assume the following.

$$\forall X0.\forall X1.k3\_gate\_1 X0 X1 = k3\_gate\_1 X1 X0 \quad (43)$$

Assume the following.

$$\forall X0.\forall X1.k2\_gate\_1 X0 X1 = k2\_gate\_1 X1 X0 \quad (44)$$



**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. \forall X13. \forall X14. \forall X15. \forall X16. \\
& \forall X17. \forall X18. \neg(\neg(\neg(v1\_xboole\_0 \ X12)) \wedge (v1\_xboole\_0 \\
& (k2\_gate\_1 \ X0 \ X3))) \wedge ((\neg(\neg(v1\_xboole\_0 \ (k2\_gate\_1 \ X0 \ X3)) \wedge (v1\_xboole\_0 \\
& \ X12))) \wedge ((\neg(\neg(v1\_xboole\_0 \ X13)) \wedge (v1\_xboole\_0 \ (k10\_gate\_1 \ (k2\_gate\_1 \\
& \ X1 \ X3) \ (k2\_gate\_1 \ X0 \ X4) \ k1\_xboole\_0))) \wedge ((\neg(\neg(v1\_xboole\_0 \ (k10\_gate\_1 \\
& \ (k2\_gate\_1 \ X1 \ X3) \ (k2\_gate\_1 \ X0 \ X4) \ k1\_xboole\_0))) \wedge (v1\_xboole\_0 \\
& \ X13))) \wedge ((\neg(\neg(v1\_xboole\_0 \ X16)) \wedge (v1\_xboole\_0 \ (k11\_gate\_1 \ (k2\_gate\_1 \\
& \ X1 \ X3) \ (k2\_gate\_1 \ X0 \ X4) \ k1\_xboole\_0))) \wedge ((\neg(\neg(v1\_xboole\_0 \ (k11\_gate\_1 \\
& \ (k2\_gate\_1 \ X1 \ X3) \ (k2\_gate\_1 \ X0 \ X4) \ k1\_xboole\_0))) \wedge (v1\_xboole\_0 \\
& \ X16))) \wedge ((\neg(\neg(v1\_xboole\_0 \ X14)) \wedge (v1\_xboole\_0 \ (k10\_gate\_1 \ (k2\_gate\_1 \\
& \ X2 \ X3) \ (k2\_gate\_1 \ X1 \ X4) \ (k2\_gate\_1 \ X0 \ X5)))) \wedge ((\neg(\neg(v1\_xboole\_0 \\
& \ (k10\_gate\_1 \ (k2\_gate\_1 \ X2 \ X3) \ (k2\_gate\_1 \ X1 \ X4) \ (k2\_gate\_1 \ X0 \ X5)))) \wedge \\
& \ (v1\_xboole\_0 \ X14))) \wedge ((\neg(\neg(v1\_xboole\_0 \ X17)) \wedge (v1\_xboole\_0 \ (k11\_gate\_1 \\
& \ (k2\_gate\_1 \ X2 \ X3) \ (k2\_gate\_1 \ X1 \ X4) \ (k2\_gate\_1 \ X0 \ X5)))) \wedge ((\neg(\neg(v1\_xboole\_0 \\
& \ (k11\_gate\_1 \ (k2\_gate\_1 \ X2 \ X3) \ (k2\_gate\_1 \ X1 \ X4) \ (k2\_gate\_1 \ X0 \ X5)))) \wedge \\
& \ (v1\_xboole\_0 \ X17))) \wedge ((\neg(\neg(v1\_xboole\_0 \ X15)) \wedge (v1\_xboole\_0 \ (k10\_gate\_1 \\
& \ (k2\_gate\_1 \ X2 \ X4) \ (k2\_gate\_1 \ X1 \ X5) \ k1\_xboole\_0))) \wedge ((\neg(\neg(v1\_xboole\_0 \\
& \ (k10\_gate\_1 \ (k2\_gate\_1 \ X2 \ X4) \ (k2\_gate\_1 \ X1 \ X5) \ k1\_xboole\_0))) \wedge \\
& \ (v1\_xboole\_0 \ X15))) \wedge ((\neg(\neg(v1\_xboole\_0 \ X18)) \wedge (v1\_xboole\_0 \ (k11\_gate\_1 \\
& \ (k2\_gate\_1 \ X2 \ X4) \ (k2\_gate\_1 \ X1 \ X5) \ k1\_xboole\_0))) \wedge ((\neg(\neg(v1\_xboole\_0 \\
& \ (k11\_gate\_1 \ (k2\_gate\_1 \ X2 \ X4) \ (k2\_gate\_1 \ X1 \ X5) \ k1\_xboole\_0))) \wedge \\
& \ (v1\_xboole\_0 \ X18))) \wedge ((\neg(\neg(v1\_xboole\_0 \ X6)) \wedge (v1\_xboole\_0 \ X12))) \wedge \\
& \ ((\neg(\neg(v1\_xboole\_0 \ X12)) \wedge (v1\_xboole\_0 \ X6))) \wedge ((\neg(\neg(v1\_xboole\_0 \ X7)) \wedge \\
& \ (v1\_xboole\_0 \ X13))) \wedge ((\neg(\neg(v1\_xboole\_0 \ X13)) \wedge (v1\_xboole\_0 \ X7))) \wedge \\
& \ ((\neg(\neg(v1\_xboole\_0 \ X8)) \wedge (v1\_xboole\_0 \ (k10\_gate\_1 \ X14 \ X16 \ k1\_xboole\_0)))) \wedge \\
& \ ((\neg(\neg(v1\_xboole\_0 \ (k10\_gate\_1 \ X14 \ X16 \ k1\_xboole\_0))) \wedge (v1\_xboole\_0 \\
& \ X8))) \wedge ((\neg(\neg(v1\_xboole\_0 \ X9)) \wedge (v1\_xboole\_0 \ (k14\_gate\_5 \ X14 \ X16 \ X15 \\
& \ X17 \ k1\_xboole\_0)))) \wedge ((\neg(\neg(v1\_xboole\_0 \ (k14\_gate\_5 \ X14 \ X16 \ X15 \ X17 \\
& \ k1\_xboole\_0))) \wedge (v1\_xboole\_0 \ X9))) \wedge ((\neg(\neg(v1\_xboole\_0 \ X10)) \wedge (v1\_xboole\_0 \\
& \ (k16\_gate\_5 \ X14 \ X16 \ X15 \ X17 \ (k2\_gate\_1 \ X2 \ X5) \ X18 \ k1\_xboole\_0)))) \wedge \\
& \ ((\neg(\neg(v1\_xboole\_0 \ (k16\_gate\_5 \ X14 \ X16 \ X15 \ X17 \ (k2\_gate\_1 \ X2 \ X5) \ X18 \\
& \ k1\_xboole\_0))) \wedge (v1\_xboole\_0 \ X10))) \wedge ((\neg(\neg(v1\_xboole\_0 \ X11)) \wedge (v1\_xboole\_0 \\
& \ (k17\_gate\_5 \ X14 \ X16 \ X15 \ X17 \ (k2\_gate\_1 \ X2 \ X5) \ X18 \ k1\_xboole\_0)))) \wedge \\
& \ ((\neg(\neg(v1\_xboole\_0 \ (k17\_gate\_5 \ X14 \ X16 \ X15 \ X17 \ (k2\_gate\_1 \ X2 \ X5) \ X18 \\
& \ k1\_xboole\_0))) \wedge (v1\_xboole\_0 \ X11))) \wedge (\neg(\neg(\neg(v1\_xboole\_0 \ X6)) \wedge (v1\_xboole\_0 \\
& \ (k5\_gate\_5 \ X0 \ X1 \ X2 \ X3 \ X4)))) \wedge ((\neg(\neg(v1\_xboole\_0 \ (k5\_gate\_5 \ X0 \ X1 \ X2 \\
& \ X3 \ X4))) \wedge (v1\_xboole\_0 \ X6))) \wedge ((\neg(\neg(v1\_xboole\_0 \ X7)) \wedge (v1\_xboole\_0 \\
& \ (k6\_gate\_5 \ X0 \ X1 \ X2 \ X3 \ X4)))) \wedge ((\neg(\neg(v1\_xboole\_0 \ (k6\_gate\_5 \ X0 \ X1 \ X2 \\
& \ X3 \ X4))) \wedge (v1\_xboole\_0 \ X7))) \wedge ((\neg(\neg(v1\_xboole\_0 \ X8)) \wedge (v1\_xboole\_0 \\
& \ (k10\_gate\_5 \ X0 \ X1 \ X2 \ X3 \ X4 \ X5)))) \wedge ((\neg(\neg(v1\_xboole\_0 \ (k10\_gate\_5 \ X0 \\
& \ X1 \ X2 \ X3 \ X4 \ X5))) \wedge (v1\_xboole\_0 \ X8))) \wedge ((\neg(\neg(v1\_xboole\_0 \ X9)) \wedge (v1\_xboole\_0 \\
& \ (k11\_gate\_5 \ X0 \ X1 \ X2 \ X3 \ X4 \ X5)))) \wedge ((\neg(\neg(v1\_xboole\_0 \ (k11\_gate\_5 \ X0 \\
& \ X1 \ X2 \ X3 \ X4 \ X5))) \wedge (v1\_xboole\_0 \ X9))) \wedge ((\neg(\neg(v1\_xboole\_0 \ X10)) \wedge (v1\_xboole\_0 \\
& \ (k12\_gate\_5 \ X0 \ X1 \ X2 \ X3 \ X4 \ X5)))) \wedge ((\neg(\neg(v1\_xboole\_0 \ (k12\_gate\_5 \ X0 \\
& \ X1 \ X2 \ X3 \ X4 \ X5))) \wedge (v1\_xboole\_0 \ X10))) \wedge ((\neg(\neg(v1\_xboole\_0 \ X11)) \wedge (v1\_xboole\_0 \\
& \ (k13\_gate\_5 \ X0 \ X1 \ X2 \ X3 \ X4 \ X5)))) \wedge (\neg(\neg(v1\_xboole\_0 \ (k13\_gate\_5 \ X0 \\
& \ X1 \ X2 \ X3 \ X4 \ X5))) \wedge (v1\_xboole\_0 \ X11))))))))))))))))))))))))))))))))))
\end{aligned}$$