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-- ----- PROOF -----
-- Length of proof is 33 . Level of proof is 16 .
-- 2 [ ]  $\overline{c4Uc3Uc4Uc3} \neq c4$ 
-- 3 [ ]  $xUy = yUx$ 
-- 4 [ ]  $xU(yUz) = xUyUz$ 
-- 6 , 5 [ copy , 4 , flip . 1 ]  $xUyUz = xU(yUz)$ 
-- 11 , 10 [ ]  $x^{\sim} = x$ 
-- 14 [ ]  $(xoy)^{\sim} = y^{\sim}ox^{\sim}$ 
-- 16 [ ]  $xol = x$ 
-- 18 [ ]  $x^{\sim}oxoyU\bar{y} = \bar{y}$ 
-- 21 , 20 [ ]  $\overline{\overline{xUyUxUy}} = x$ 
-- 24 [ para_from , 3 . 1 . 1 , 2 . 1 . 1 ]  $\overline{\overline{c4Uc3Uc4Uc3}} \neq c4$ 
-- 28 [ para_into , 10 . 1 . 1 , 10 . 1 . 1 ]  $x = x$ 
-- 29 [ para_into , 5 . 1 . 1 . 1 , 3 . 1 . 1 , demod , 6 ]  $xU(yUz) = yU(xUz)$ 
-- 30 [ para_into , 5 . 1 . 1 , 3 . 1 . 1 ]  $xU(yUz) = yU(zUx)$ 
-- 32 [ para_into , 14 . 1 . 1 . 1 , 16 . 1 . 1 , flip . 1 ]  $\iota^{\sim}ox^{\sim} = x^{\sim}$ 
-- 38 [ para_into , 32 . 1 . 1 . 2 , 10 . 1 . 1 , demod , 11 ]  $\iota^{\sim}ox = x$ 
-- 41 , 40 [ para_into , 38 . 1 . 1 , 16 . 1 . 1 ]  $\iota^{\sim} = \iota$ 

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-- 43 , 42 [ back_demod , 38 , demod , 41 ]  $\iota_0 x = x$ 
-- 46 [ para_into , 29 . 1 . 1 , 3 . 1 . 1 , demod , 6 ]  $x \cup (y \cup z) = x \cup (z \cup y)$ 
-- 50 [ para_into , 30 . 1 . 1 . 2 , 3 . 1 . 1 ]  $x \cup (y \cup z) = z \cup (y \cup x)$ 
-- 58 [ para_into , 18 . 1 . 1 . 1 . 1 , 40 . 1 . 1 , demod , 43 , 43 ]  $\bar{x} \cup \bar{x} = \bar{x}$ 
-- 143 [ para_into , 20 . 1 . 1 . 1 . 2 . 1 , 58 . 1 . 1 ]  $\overline{\bar{x} \cup x \cup \bar{x}} = \bar{x}$ 
-- 151 [ para_into , 20 . 1 . 1 . 1 , 3 . 1 . 1 ]  $\overline{x \cup \bar{y} \cup \bar{x} \cup y} = x$ 
-- 156 , 155 [ para_from , 20 . 1 . 1 , 58 . 1 . 1 . 2 , demod , 21 , 21 ]  $x \cup x = x$ 
-- 159 [ para_into , 155 . 1 . 1 , 50 . 1 . 1 ]  $x \cup (y \cup (y \cup x)) = y \cup x$ 
-- 164 , 163 [ para_into , 155 . 1 . 1 , 29 . 1 . 1 , demod , 6 , 156 ]  $x \cup (x \cup y) = x \cup y$ 
-- 166 , 165 [ back_demod , 159 , demod , 164 ]  $x \cup (y \cup x) = y \cup x$ 
-- 167 [ para_from , 155 . 1 . 1 , 20 . 1 . 1 . 1 . 1 . 1 ]  $\bar{x} \cup x \cup \bar{x} = x$ 
-- 221 , 220 [ para_into , 167 . 1 . 1 . 1 , 3 . 1 . 1 ]  $x \cup \bar{x} \cup \bar{x} = x$ 
-- 227 , 226 [ para_from , 167 . 1 . 1 , 20 . 1 . 1 . 1 . 2 , demod , 166 ]  $\overline{\bar{x} \cup \bar{x} \cup x} = \bar{x}$ 
-- 273 [ para_into , 220 . 1 . 1 . 1 . 1 . 1 . 2 , 220 . 1 . 1 , demod , 6 , 221 ]
--            $\overline{\bar{x} \cup \bar{x} \cup (x \cup x)} \cup x = x \cup \bar{x} \cup \bar{x}$ 
-- 292 , 291 [ para_from , 220 . 1 . 1 , 20 . 1 . 1 . 1 . 2 , demod , 227 ]  $\bar{x} \cup x = x \cup \bar{x}$ 
-- 299 [ back_demod , 143 , demod , 292 ]  $\overline{\bar{x} \cup \bar{x} \cup \bar{x}} = \bar{x}$ 
-- 301 [ para_into , 226 . 1 . 1 . 1 . 1 . 1 . 2 , 226 . 1 . 1 , demod , 6 , 292 , 6 , 227 ]
--            $\overline{x \cup (\bar{x} \cup x \cup \bar{x}) \cup (x \cup \bar{x} \cup x)} = \bar{x}$ 
-- 324 , 323 [ para_from , 226 . 1 . 1 , 220 . 1 . 1 . 1 . 2 , demod , 227 , 6 , 292 , 6 ]
--            $\overline{x \cup (\bar{x} \cup x \cup \bar{x}) \cup \bar{x}} = x \cup \bar{x} \cup x$ 
-- 347 , 346 [ para_into , 291 . 1 . 1 . 1 , 46 . 1 . 1 , demod , 6 ]  $\overline{\bar{x} \cup y \cup (y \cup x)} = x \cup (y \cup x \cup y)$ 

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-- 355 , 354 [ back_demod , 273 , demod , 347 ]  $\overline{\overline{\overline{x \cup (\overline{x \cup x \cup \overline{x}})} \cup x}} = \overline{x \cup \overline{x} \cup \overline{x}}$ 
-- 958 , 957 [ para_into , 299 . 1 . 1 . 1 . 1 . 1 . 2 , 220 . 1 . 1 , demod , 6 , 347 , 221 ,
-- 324 , 221 ]  $\overline{x \cup \overline{x} \cup x} = x$ 
-- 974 , 973 [ back_demod , 301 , demod , 958 , 355 ]  $\overline{x \cup \overline{x} \cup \overline{x}} = \overline{x}$ 
-- 988 , 987 [ back_demod , 220 , demod , 974 ]  $\overline{\overline{x}} = x$ 
-- 1060 , 1059 [ para_into , 987 . 1 . 1 . 1 , 151 . 1 . 1 , flip . 1 ]  $\overline{x \cup \overline{y} \cup x \cup \overline{y}} = \overline{x}$ 
-- 1071 [ back_demod , 24 , demod , 1060 , 988 ]  $c4 \neq c4$ 
-- 1072 [ binary , 1071 . 1 , 28 . 1 ]  $F$ 
-- ----- end of proof -----
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--
-- Search stopped by max_proofs option .
--
-- = = = = = end of search = = = = =
--
-- ----- statistics -----
-- clauses given 49
-- clauses generated 1209
-- clauses kept 593
-- clauses forward subsumed 942

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-- clauses back subsumed 3
-- Kbytes malloced 926
--
-- _____ times ( seconds ) _____
-- user CPU time 0 . 27 ( 0 hr , 0 min , 0 sec )
-- system CPU time 0 . 0 ( 0 hr , 0 min , 0 sec )
-- wall - clock time 0 ( 0 hr , 0 min , 0 sec )
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