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Intuitionistic fuzzy Conjunctions and Disjunctions from Second Type

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Abstract: The purpose of this article is the calculation of conjunctions and disjunctions with respect to certain IF implications and negations. With constructed operations we consider algebraic structures such monoids, lattices and study their properties.
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1 Introduction

We will use defined in [1] implications to calculate their respective conjunctions and disjunctions, with respect to the rule:

$$\langle a, b\rangle \vee \langle c, d\rangle = \neg\langle a, b\rangle \to \neg\neg\langle c, d\rangle$$

$$\langle a, b\rangle \wedge \langle c, d\rangle = \neg(\neg\neg\langle a, b\rangle \to \neg\langle c, d\rangle)$$

2 Construction of Conjunctions and Disjunctions

$\vee_{2,1}$	$\langle \max(a, \min(b, c)), \min(b, d)\rangle$
$\wedge_{2,1}$	$\langle \min(a, c), \max(b, \min(a, d))\rangle$
$\vee_{2,2}$	$\langle \overline{sg}(\overline{sg}(a) - \mathrm{sg}(c)), \overline{sg}(c)\mathrm{sg}(\overline{sg}(a) - \mathrm{sg}(c))\rangle;$
$\wedge_{2,2}$	$\langle \mathrm{sg}(\mathrm{sg}(a) - \overline{sg}(c)), \overline{sg}(\mathrm{sg}(a) - \overline{sg}(c))\rangle;$
$\vee_{2,3}$	$\langle 1 - \overline{sg}(c)\mathrm{sg}(\overline{sg}(a) - \mathrm{sg}(c))), \overline{sg}(c)\mathrm{sg}(\overline{sg}(a) - \mathrm{sg}(c))\rangle;$
$\wedge_{2,3}$	$\langle \overline{sg}(1 - \mathrm{sg}(c)\mathrm{sg}(\mathrm{sg}(a) - \overline{sg}(c))),$ $\mathrm{sg}(1 - \mathrm{sg}(c)\mathrm{sg}(\mathrm{sg}(a) - \overline{sg}(c)))\rangle$
$\vee_{2,4}$	$\langle \max(a, c), \min(b, d)\rangle$
$\wedge_{2,4}$	$\langle \min(a, c), \max(b, d)\rangle$
$\vee_{2,5}$	$\langle \min(1, a + c), \max(0, b + d - 1)\rangle$
$\wedge_{2,5}$	$\langle \max(0, a + c - 1), \min(1, d + b)\rangle$
$\vee_{2,6}$	$\langle a + b.c, b.d\rangle$
$\wedge_{2,6}$	$\langle ac, b + ad\rangle$
$\vee_{2,7}$	$\langle \min(\max(a, b), \max(a, c), \max(c, d)),$ $\max(\min(c, d) \min(d, b), \min(a, b))\rangle$
$\wedge_{2,7}$	$\langle \max(\min(c, d) \min(a, c), \min(a, b)),$ $\min(\max(a, b), \max(b, d), \max(c, d))\rangle$
$\vee_{2,8}$	$\langle 1 - (1 - \min(\mathrm{sg}(a), \mathrm{sg}(c)))\mathrm{sg}(\overline{sg}(a) - \mathrm{sg}(c)),$ $\max(\overline{sg}(a), \overline{sg}(c))\mathrm{sg}(\overline{sg}(a) - \mathrm{sg}(c))\mathrm{sg}(\overline{sg}(c) - \mathrm{sg}(a))\rangle$
$\wedge_{2,8}$	$\langle \overline{sg}(1 - (1 - \min(\overline{sg}(a), \overline{sg}(c)))\mathrm{sg}(\mathrm{sg}(a) - \overline{sg}(c))),$ $\mathrm{sg}(1 - (1 - \min(\overline{sg}(a), \overline{sg}(c)))\mathrm{sg}(\mathrm{sg}(a) - \overline{sg}(c)))\rangle;$
$\vee_{2,9}$	$\langle ab + a^2 + b^2c(c + d),$ $ab^2 + ba^2 + b^2d(cd + c^2 + d)\rangle;$
$\wedge_{2,9}$	$\langle (ab + a^2)(b^2 + a^2b + ab^2 + (a^2 + ab)(cd + c^2)),$ $(b^2 + a^2b + ab^2 + (ab + a^2)^2d)^2$ $+(b^2 + a^2b + ab^2 + (ab + a^2)^2d)(ab + a^2)$ $.(b^2 + a^2b + ab^2 + (a^2 + ab)(cd + c^2))\rangle$
$\vee_{2,10}$	$\langle \min(c, \overline{sg}(1 - b)) + \mathrm{sg}(1 - b)(\overline{sg}(1 - c) + \min(a,$ $\mathrm{sg}(1 - c))), \min(d, \overline{sg}(1 - b)) + \min(b, \mathrm{sg}(1 - b), \mathrm{sg}(1 - c))\rangle$
$\wedge_{2,10}$	$\langle c.\overline{\mathrm{sg}}(1 - a) + a.\mathrm{sg}(1 - a).\mathrm{sg}(1 - d),$ $d.\overline{\mathrm{sg}}(1 - a) + \mathrm{sg}(1 - a).(\overline{\mathrm{sg}}(1 - d) + b.\mathrm{sg}(1 - d))\rangle$
$\vee_{2,11}$	$\langle 1 - \overline{sg}(c)\mathrm{sg}(\overline{sg}(a) - \mathrm{sg}(c)),$ $\overline{sg}(c)\mathrm{sg}(\overline{sg}(a) - \mathrm{sg}(c))\mathrm{sg}(\overline{sg}(c) - \mathrm{sg}(a))\rangle$

$\wedge_{2,11}$	$\langle \overline{sg}(1-\mathrm{sg}(c)\mathrm{sg}(\mathrm{sg}(a)-\overline{sg}(c))),$ $\mathrm{sg}(1-\mathrm{sg}(c)\mathrm{sg}(\mathrm{sg}(a)-\overline{sg}(c)))\rangle$
$\vee_{2,12}$	$\langle \max(1-b,1-d),1-\max(1-b,1-d)\rangle$
$\wedge_{2,12}$	$\langle 1-\max(b,d),\max(b,d)\rangle$
$\vee_{2,13}$	$\langle a+c-ac,bd\rangle$
$\wedge_{2,13}$	$\langle ac,b+d-bd\rangle$
$\vee_{2,14}$	$\langle 1-(1-\mathrm{sg}(1-d))\mathrm{sg}(\overline{sg}(1-b)-\mathrm{sg}(1-d))$ $-\overline{sg}(1-d)\overline{sg}(\overline{sg}(1-b)-\mathrm{sg}(1-d))\mathrm{sg}(\overline{sg}(1-d)$ $-\mathrm{sg}(1-b)),\overline{sg}(1-d)\mathrm{sg}(\overline{sg}(1-d)-\mathrm{sg}(1-b))\rangle$
$\wedge_{2,14}$	$\langle \overline{sg}(1-\mathrm{sg}(1-d)\mathrm{sg}(\mathrm{sg}(1-d)-\overline{sg}(1-b))),$ $\mathrm{sg}(1-\mathrm{sg}(1-d)\mathrm{sg}(\mathrm{sg}(1-d)-\overline{sg}(1-b)))\rangle;$
$\vee_{2,15}$	$\langle 1-(1-\min(\mathrm{sg}(1-b),\mathrm{sg}(1-d)))\mathrm{sg}(\mathrm{sg}(\overline{sg}(1-b)$ $-\mathrm{sg}(1-d))+\mathrm{sg}(\overline{sg}(1-d)-\mathrm{sg}(1-b)))$ $-\min(\mathrm{sg}(1-b),\mathrm{sg}(1-d))\mathrm{sg}(\overline{sg}(1-b)-\mathrm{sg}(1-d))$ $\mathrm{sg}(\overline{sg}(1-d)-\mathrm{sg}(1-b)),\ 1-(1-\max(\overline{sg}(1-b),$ $\overline{sg}(1-d)))\mathrm{sg}(\overline{sg}(\overline{sg}(1-b)-\mathrm{sg}(1-d))$ $+\overline{sg}(\overline{sg}(1-d)-\mathrm{sg}(1-b)))-\max(\overline{sg}(1-b),\overline{sg}(1-d))$ $.\overline{sg}(\overline{sg}(1-b)-\mathrm{sg}(1-d))\overline{sg}(\overline{sg}(1-d)-\mathrm{sg}(1-b))\rangle$
$\wedge_{2,15}$	$\langle \overline{sg}((1-\max(\mathrm{sg}(1-b),\mathrm{sg}(1-d)))\mathrm{sg}(\overline{sg}(\mathrm{sg}(1-b)$ $-\overline{sg}(1-d))+\overline{sg}(\mathrm{sg}(1-d)-\overline{sg}(1-b)))+\max(\mathrm{sg}(1-b),$ $\mathrm{sg}(1-d))\overline{sg}(\mathrm{sg}(1-b)-\overline{sg}(1-d))\overline{sg}(\mathrm{sg}(1-d)-\overline{sg}(1-b)))\rangle$
$\vee_{2,16}$	$\langle \max(\mathrm{sg}(a),\mathrm{sg}(c)),\min(\overline{sg}(a),\overline{sg}(c))\rangle$
$\wedge_{2,16}$	$\langle \overline{sg}(\max(\overline{sg}(a),\overline{sg}(c))),\mathrm{sg}(\max(\overline{sg}(a),\overline{sg}(c)))\rangle$
$\vee_{2,17}$	$\langle \max(a^2+ab,c(c+d)),$ $\min((ab+a^2)b+b^2,d(cd+c^2+d))\rangle$
$\wedge_{2,17}$	$\langle \min((ab+a^2)((ab+a^2)b+b^2)+(ab+a^2)^2,c^2+cd),$ $\max(b^2+b(a^2+ab),d)^2+\max(b^2+b(a^2+ab),$ $d)\min((ab+a^2)((ab+a^2)b+b^2)$ $+(ab+a^2)^2,c^2+cd)\rangle$
$\vee_{2,18}$	$\langle \max(1-b,1-d),\min(b,d)\rangle$
$\wedge_{2,18}$	$\langle 1-\max(b,d),\max(b,d)\rangle$
$\vee_{2,19}$	$\langle \max(os(\overline{sg}(1-b)+\overline{sg}(1-b)),$ $\overline{sg}(d)),\min(\overline{sg}(1-b),\mathrm{sg}(d))\rangle$
$\wedge_{2,19}$	$\langle \overline{sg}(\min(\mathrm{sg}(1-\mathrm{sg}(1-b)),\mathrm{sg}(1-d))),$ $\mathrm{sg}(\min(\mathrm{sg}(1-\mathrm{sg}(1-b)),\mathrm{sg}(1-d)))\rangle$
$\vee_{2,20}$	$\langle \max(\mathrm{sg}(a),\mathrm{sg}(c)),\min(\overline{sg}(a),\overline{sg}(c))\rangle$

$\wedge_{2,20}$	$\langle \overline{sg}(\max(\overline{sg}(a), \overline{sg}(c))), \mathrm{sg}(\max(\overline{sg}(a), \overline{sg}(c)))\rangle$
$\vee_{2,21}$	$\langle \max(a^2 + ab, c(c + d)(c(c + d) + d(cd + d + c^2))),$ $\min(b(a^2 + ab + b), d(cd + d + c^2)(c^2(c + d)^2$ $+d(cd + d + c^2) + c(c + d)d(cd + d + c^2)))\rangle$
$\wedge_{2,21}$	$\langle \min((a^2 + ab)(b^2 + b(a^2 + ab) + a^2 + ab),$ $(c^2 + cd)(d^2 + c^2 + cd + (c^2 + cd)d)),$ $\max(b^2 + b(a^2 + ab), d(d + c^2 + cd))^2$ $+ \max(b^2 + b(a^2 + ab), d(d + c^2 + cd))$ $. \min((a^2 + ab)(b^2 + b(a^2 + ab) + a^2 + ab),$ $(c^2 + cd)(d^2 + c^2 + cd + (c^2 + cd)d))\rangle$
$\vee_{2,22}$	$\langle 1 - \min(b, d), \min(b, d)\rangle$
$\wedge_{2,22}$	$\langle 1 - \max(b, d), \max(b, d)\rangle$
$\vee_{2,23}$	$\langle 1 - \min(\overline{sg}(1 - b), \overline{sg}(1 - d)), \min(\overline{sg}(1 - b), \overline{sg}(1 - d))\rangle$
$\wedge_{2,23}$	$\langle \overline{sg}(1 - \min(\mathrm{sg}(1 - b), \mathrm{sg}(1 - d))),$ $\mathrm{sg}(1 - \min(\mathrm{sg}(1 - b), \mathrm{sg}(1 - d)))\rangle$
$\vee_{2,24}$	$\langle \overline{sg}(\overline{sg}(1 - b) - \mathrm{sg}(c))\overline{sg}(\overline{sg}(1 - d) - \mathrm{sg}(a)),$ $\mathrm{sg}(\overline{sg}(1 - b) - \mathrm{sg}(c))\mathrm{sg}(\overline{sg}(1 - d) - \mathrm{sg}(a))\rangle$
$\wedge_{2,24}$	$\langle \overline{sg}(1 - \mathrm{sg}(\mathrm{sg}(a) - \overline{sg}(1 - d))\mathrm{sg}(\mathrm{sg}(c) - \overline{sg}(1 - b))),$ $\mathrm{sg}(\overline{sg}(\mathrm{sg}(a) - \overline{sg}(1 - d))\overline{sg}(\mathrm{sg}(c) - \overline{sg}(1 - b)))\rangle$
$\vee_{2,25}$	$\langle \max(a, \mathrm{sg}(1 - b)\overline{sg}(1 - a)),$ $\overline{sg}(1 - c)\overline{sg}(\overline{sg}(1 - d))\overline{sg}(1 - \overline{sg}(1 - c))),$ $\min(\overline{sg}(1 - b), \overline{sg}(1 - d))\rangle$
$\wedge_{2,25}$	$\langle \overline{sg}(1 - \min(\overline{sg}(1 - a), c)),$ $\max(\overline{sg}(1 - b), \mathrm{sg}(1 - a)\overline{sg}(1 - b))\rangle$
$\vee_{2,26}$	$\langle \max(\mathrm{sg}(a), \mathrm{sg}(c)), \min(\mathrm{sg}(1 - b), \overline{sg}(1 - d))\rangle$
$\wedge_{2,26}$	$\langle \overline{sg}(1 - \min(\overline{sg}(a)), \mathrm{sg}(c)), \mathrm{sg}(\max(\overline{sg}(1 - b), \overline{sg}(1 - d)))\rangle$
$\vee_{2,27}$	$\langle \max(\mathrm{sg}(a), \mathrm{sg}(c)), \min(\overline{sg}(1 - b), \overline{sg}(1 - d))\rangle$
$\wedge_{2,27}$	$\langle \overline{sg}(1 - \min(\mathrm{sg}(a), \mathrm{sg}(c))), \mathrm{sg}(\max(\overline{sg}(1 - b), \overline{sg}(1 - d)))\rangle$
$\vee_{2,28}$	$\langle \max(\overline{sg}(1 - a), \overline{sg}(1 - c)), \min(\overline{sg}(1 - b), \overline{sg}(1 - d))\rangle$
$\wedge_{2,28}$	$\langle \overline{sg}(1 - \min(\overline{sg}(1 - a), c)), \max(\overline{sg}(1 - b), \overline{sg}(1 - d))\rangle$
$\vee_{2,29}$	$\langle \max(\overline{sg}(1 - a), \overline{sg}(1 - c)), \min(\overline{sg}(1 - b), \overline{sg}(1 - d))\rangle$
$\wedge_{2,29}$	$\langle \overline{sg}(1 - \min(\overline{sg}(1 - a), \overline{sg}(1 - c))), \max(\overline{sg}(1 - b),$ $\overline{sg}(1 - d)\rangle$
$\vee_{2,30}$	$\langle \max(a, \min(1 - a, c)), \min(1 - a, 1 - c)\rangle$
$\wedge_{2,30}$	$\langle 1 - \max(1 - a, \min(a, 1 - c)), \max(1 - a, \min(a, 1 - c))\rangle$
$\vee_{2,31}$	$\langle \overline{sg}(\overline{sg}(a) - \mathrm{sg}(c)), \overline{sg}(c)\mathrm{sg}(\overline{sg}(a) - \mathrm{sg}(c))\rangle$

$\wedge_{2,31}$	$\langle \mathrm{sg}(\mathrm{sg}(a) - \overline{sg}(c)), \overline{sg}(\mathrm{sg}(a) - \overline{sg}(c))\rangle$
$\vee_{2,32}$	$\langle 1 - \overline{sg}(c)\mathrm{sg}(\overline{sg}(a) - \mathrm{sg}(c)), \overline{sg}(c)\mathrm{sg}(\overline{sg}(a) - \mathrm{sg}(c))\rangle$
$\wedge_{2,32}$	$\langle \overline{sg}(1 - \mathrm{sg}(c)\mathrm{sg}(\mathrm{sg}(a) - \overline{sg}(c))),$ $\mathrm{sg}(1 - \mathrm{sg}(c)\mathrm{sg}(\mathrm{sg}(a) - \overline{sg}(c)))\rangle$
$\vee_{2,33}$	$\langle 1 - \min(1-a, 1-c), \min(1-a, 1-c)\rangle$
$\wedge_{2,33}$	$\langle \min(a, c), 1 - \min(a, c)\rangle$
$\vee_{2,34}$	$\langle \min(1, a+c), \max(0, (1-c-a)\rangle$
$\wedge_{2,34}$	$\langle 1 - \min(1, 2-a-c), \min(1, 2-a-c)\rangle$
$\vee_{2,35}$	$\langle 1 - (1-a)(1-c), (1-a)(1-c)\rangle$
$\wedge_{2,35}$	$\langle ac, 1-ac\rangle$
$\vee_{2,36}$	$\langle \min(1 - \min(1-a, 1-c), \max(a, 1-a), \max(c, (1-c))),$ $\max(\min(1-a, (1-c)), \min(a, 1-a), \min(c, (1-c)))\rangle$
$\vee_{2,37}$	$\langle 1 - \max(\overline{sg}(a), \overline{sg}(c)).\mathrm{sg}(\overline{sg}(a) - \mathrm{sg}(c)),$ $\max(\overline{sg}(a), \overline{sg}(c)).\mathrm{sg}(\overline{sg}(a) - \mathrm{sg}(c))\rangle$
$\wedge_{2,37}$	$\langle \overline{sg}(1 - \max(\mathrm{sg}(a), \mathrm{sg}(c)).\mathrm{sg}(\mathrm{sg}(a) - \overline{sg}(c))),$ $\mathrm{sg}(1 - \max(\mathrm{sg}(a), \mathrm{sg}(c)).\mathrm{sg}(\mathrm{sg}(a) - \overline{sg}(c)))\rangle$
$\vee_{2,38}$	$\langle a + (1-a)^2c, a(1-a) + (1-a)^2(1-c)\rangle$
$\wedge_{2,38}$	$\langle a - a^2(1-c), 1 - a + a^2(1-c)\rangle$
$\vee_{2,39}$	$\langle (1-(1-c))\overline{sg}(a) + \mathrm{sg}(a)(\overline{sg}((1-c)) + (a)\mathrm{sg}((1-c))),$ $(1-c)\overline{sg}(a) + a\mathrm{sg}(a)\mathrm{sg}((1-c))\rangle$
$\wedge_{2,39}$	$\langle 1 - (1-c)\overline{sg}(1-a) - \mathrm{sg}(1-a)(\overline{sg}(c) + (1-a)\mathrm{sg}(c)),$ $(1-c)\overline{sg}(1-a) + \mathrm{sg}(1-a)(\overline{sg}(c) + (1-a)\mathrm{sg}(c))\rangle$
$\vee_{2,40}$	$\langle \overline{sg}(\overline{sg}(a) - \mathrm{sg}(c)), \mathrm{sg}(\overline{sg}(a) - \mathrm{sg}(c))\rangle$
$\wedge_{2,40}$	$\langle \mathrm{sg}(\mathrm{sg}(a) - \overline{sg}(c)), \overline{sg}(\mathrm{sg}(a) - \overline{sg}(c))\rangle$
$\vee_{2,41}$	$\langle \max(\mathrm{sg}(a), 1 - \overline{sg}(c)), \min(\overline{sg}(a), \overline{sg}(c))\rangle$
$\wedge_{2,41}$	$\langle \overline{sg}(\max(\overline{sg}(a), \overline{sg}(c))), \mathrm{sg}(\max(\overline{sg}(a), \overline{sg}(c)))\rangle$
$\vee_{2,42}$	$\langle \max(\mathrm{sg}(a), \mathrm{sg}(c)), \min(\overline{sg}(a), \overline{sg}(c))\rangle$
$\wedge_{2,42}$	$\langle \overline{sg}(\max(\overline{sg}(a), \overline{sg}(c))), \mathrm{sg}(\max(\overline{sg}(a), \overline{sg}(c)))\rangle$
$\vee_{2,43}$	$\langle \max(\mathrm{sg}(a), \mathrm{sg}(c)), \min(\overline{sg}(a), \overline{sg}(c))\rangle$
$\wedge_{2,43}$	$\langle \overline{sg}(\max(\overline{sg}(a), 1-c)), \max(\overline{sg}(a), 1-c)\rangle$
$\vee_{2,44}$	$\langle \max(\mathrm{sg}(a), \mathrm{sg}(c)), \min(\overline{sg}(a), \overline{sg}(c))\rangle$
$\wedge_{2,44}$	$\langle \overline{sg}(\max(\overline{sg}(a), 1-c)), \max(\overline{sg}(a), 1-c)\rangle$
$\vee_{2,45}$	$\langle \max(\mathrm{sg}(a), \mathrm{sg}(c)), \min(\overline{sg}(a), \overline{sg}(c))\rangle$
$\wedge_{2,45}$	$\langle \overline{sg}(\max(\overline{sg}(a), \overline{sg}(c))), \max(\overline{sg}(a), \overline{sg}(c))\rangle$
$\vee_{2,46}$	$\langle \max(1-b, \min(b, 1-d)), \min(b, d)\rangle$

$\wedge_{2,46}$	$\langle 1-\max(b,d),\max(b,d)\rangle$
$\vee_{2,47}$	$\langle \overline{sg}(\overline{sg}(1-b)-\mathrm{sg}(1-d)),$ $\overline{sg}(1-d)\mathrm{sg}(\overline{sg}(1-b)-\mathrm{sg}(1-d))\rangle$
$\wedge_{2,47}$	$\langle \overline{sg}(1-\mathrm{sg}(1-d)\mathrm{sg}(\mathrm{sg}(1-b)-\overline{sg}(1-d))),$ $\mathrm{sg}(1-\mathrm{sg}(1-d)\mathrm{sg}(\mathrm{sg}(1-b)-\overline{sg}(1-d)))\rangle$
$\vee_{2,48}$	$\langle 1-\overline{sg}(1-d)\mathrm{sg}(\overline{sg}(1-b)-\mathrm{sg}(1-d)),$ $\overline{sg}(1-d)\mathrm{sg}(\overline{sg}(1-b)-\mathrm{sg}(1-d))\rangle$
$\wedge_{2,48}$	$\langle \overline{sg}(1-\mathrm{sg}(1-d)\mathrm{sg}(\mathrm{sg}(1-b)-\overline{sg}(1-d))),$ $\mathrm{sg}(1-\mathrm{sg}(1-d)\mathrm{sg}(\mathrm{sg}(1-b)-\overline{sg}(1-d)))\rangle$
$\vee_{2,49}$	$\langle \min(1,2-b-d),\max(0,b-1+d)\rangle$
$\wedge_{2,49}$	$\langle \max(0,1-b-d),1-\max(0,1-b-d)\rangle$
$\vee_{2,50}$	$\langle 1-b+b(1-d),b-b(1-d)\rangle$
$\wedge_{2,50}$	$\langle (1-b)(1-d),1-(1-b)(1-d)\rangle$
$\vee_{2,51}$	$\langle \min(\max(1-b,1-d),\max(1-b,b),\max(1-d,d)),$ $\max(1-\max(1-b,1-d),\min(1-b,b),\min(1-d,d))\rangle$
$\wedge_{2,51}$	$\langle \max(1-\max(b,d),\min(1-b,b),\min(d,1-d)),$ $1-\max(1-\max(b,d),\min(1-b,b),\min(d,1-d))\rangle$
$\vee_{2,52}$	$\langle 1-(1-\min(\mathrm{sg}(1-b),\mathrm{sg}(1-d)))\mathrm{sg}(\overline{sg}(1-b)$ $-\mathrm{sg}(1-d)),1-\min(\mathrm{sg}(1-b),\mathrm{sg}(1-d))\mathrm{sg}(\overline{sg}(1-b)$ $-\mathrm{sg}(1-d))\rangle$
$\wedge_{2,52}$	$\langle \overline{sg}(\min(\overline{sg}(1-b),\overline{sg}(1-d))\mathrm{sg}(\mathrm{sg}(1-b)-\overline{sg}(1-d))),$ $\mathrm{sg}(\min(\overline{sg}(1-b),\overline{sg}(1-d))\mathrm{sg}(\mathrm{sg}(1-b)-\overline{sg}(1-d)))\rangle$
$\vee_{2,53}$	$\langle 1-b+b^2(1-d),(1-b)b+b^2d\rangle$
$\wedge_{2,53}$	$\langle (1-b)b+(1-b)^2(1-d),1-(1-b)b-(1-b)^2(1-d)\rangle$
$\vee_{2,54}$	$\langle (1-d)\overline{sg}(1-b)+\mathrm{sg}(1-b)(\overline{sg}(d)+(1-b)\mathrm{sg}(d)),$ $(1-(1-d))\overline{sg}(1-b)+b\mathrm{sg}(b)\mathrm{sg}(1-(1-d))\rangle$
$\wedge_{2,54}$	$\langle (1-d)\overline{sg}(1-b)+b\mathrm{sg}(b)\mathrm{sg}(1-d),$ $1-(1-d)\overline{sg}(1-b)-b\mathrm{sg}(b)\mathrm{sg}(1-d)\rangle$
$\vee_{2,55}$	$\langle \overline{sg}(\overline{sg}(1-b)-\mathrm{sg}(1-d)),\mathrm{sg}(\overline{sg}(1-b)-\mathrm{sg}(1-d))\rangle$
$\wedge_{2,55}$	$\langle \mathrm{sg}(\mathrm{sg}(1-b)-\overline{sg}(1-d)),\overline{sg}(\mathrm{sg}(1-b)-\overline{sg}(1-d))\rangle$
$\vee_{2,56}$	$\langle \max(\mathrm{sg}(1-b),\overline{sg}(d)),\min(\overline{sg}(1-b),1-\overline{sg}(d))\rangle$
$\wedge_{2,56}$	$\langle \overline{sg}(1-\min(\overline{sg}(1-b),\mathrm{sg}(1-d))),$ $\mathrm{sg}(1-\min(\overline{sg}(1-b),\mathrm{sg}(1-d)))\rangle$
$\vee_{2,57}$	$\langle \max(\mathrm{sg}(1-b),\mathrm{sg}(1-d)),\min(\overline{sg}(1-b),\overline{sg}(1-d))\rangle$
$\wedge_{2,57}$	$\langle \overline{sg}(1-\min(\mathrm{sg}(1-b),\mathrm{sg}(1-d))),$ $\mathrm{sg}(1-\min(\mathrm{sg}(1-b),\mathrm{sg}(1-d)))\rangle$

$\vee_{2,58}$	$\langle \max(\overline{sg}(b), \overline{sg}(1-\overline{sg}(d))), 1-\max(1-b, \overline{sg}(d))\rangle$
$\wedge_{2,58}$	$\langle \overline{sg}(\max(b, \overline{sg}(1-d))), \max(b, \overline{sg}(1-d))\rangle$
$\vee_{2,59}$	$\langle \max(\overline{sg}(b), \overline{sg}(d)), 1-\max(1-b, \overline{sg}(d))\rangle$
$\wedge_{2,59}$	$\langle \overline{sg}(\max(b, \overline{sg}(1-d))), \max(b, \overline{sg}(1-d))\rangle$
$\vee_{2,60}$	$\langle \max(\overline{sg}(b), \overline{sg}(d)), \min(b, \mathrm{sg}(d))\rangle$
$\wedge_{2,60}$	$\langle \overline{sg}(1-\min(1-b, \mathrm{sg}(1-d))), 1-\min(1-b, \mathrm{sg}(1-d))\rangle$
$\vee_{2,61}$	$\langle \max(c, \min(a, d)), \min(b, d)\rangle$
$\wedge_{2,61}$	$\langle \min(a, c), \max(d, \min(b, c))\rangle$
$\vee_{2,62}$	$\langle \overline{sg}(\overline{sg}(1-d)-a), \overline{sg}(1-b)\mathrm{sg}(\overline{sg}(1-d)-a)\rangle$
$\wedge_{2,62}$	$\langle \overline{sg}(1-\overline{sg}(1-a)\mathrm{sg}(c-\overline{sg}(1-b))), \overline{sg}(c-\overline{sg}(1-b))\rangle$
$\vee_{2,63}$	$\langle 1-(1-a)\mathrm{sg}(d-a), b\mathrm{sg}(d-a)\rangle$
$\wedge_{2,63}$	$\langle a\mathrm{sg}(c-b), 1-(1-b)\mathrm{sg}(c-b)\rangle$
$\vee_{2,64}$	$\langle c+ad, bd\rangle$
$\wedge_{2,64}$	$\langle ac, d+bc\rangle$
$\vee_{2,65}$	$\langle 1-(1-\min(\mathrm{sg}(a), \mathrm{sg}(c)))\mathrm{sg}(\overline{sg}(1-d)$ $-\mathrm{sg}(a)), \max(\overline{sg}(1-b), \overline{sg}(1-d))\mathrm{sg}(\overline{sg}(1-d)$ $-\mathrm{sg}(a))\mathrm{sg}(\overline{sg}(1-b)-\mathrm{sg}(c))\rangle$
$\wedge_{2,65}$	$\langle \overline{sg}(1-\max(\mathrm{sg}(a), \mathrm{sg}(c))\mathrm{sg}(\mathrm{sg}(c)$ $-\overline{sg}(1-b))\mathrm{sg}(\mathrm{sg}(a)-\overline{sg}(1-d))),$ $\mathrm{sg}(1-(1-\min(\overline{sg}(1-b), \overline{sg}(1-d)))\mathrm{sg}(\mathrm{sg}(c)$ $-\overline{sg}(1-b)))\rangle$
$\vee_{2,66}$	$\langle c+d^2a, ad+d^2b\rangle$
$\wedge_{2,66}$	$\langle bc+c^2a, d+c^2b\rangle$
$\vee_{2,67}$	$\langle a\overline{sg}(1-d)+\mathrm{sg}(1-d)(\overline{sg}(1-a)+c\mathrm{sg}(1-a)),$ $b\overline{sg}(1-d)+d\mathrm{sg}(1-d)\mathrm{sg}(1-a)\rangle$
$\wedge_{2,67}$	$\langle a\overline{sg}(1-c)+d\mathrm{sg}(1-c)\mathrm{sg}(1-b),$ $b\overline{sg}(1-c)+\mathrm{sg}(1-c)(\overline{sg}(1-b)+d\mathrm{sg}(1-b))\rangle$
$\vee_{2,68}$	$\langle 1-(1-a)\mathrm{sg}(d-a), b\mathrm{sg}(d-a)\mathrm{sg}(b-c)\rangle$
$\wedge_{2,68}$	$\langle a\mathrm{sg}(c-b)\mathrm{sg}(a-d), 1-(1-b)\mathrm{sg}(c-b)\rangle$
$\vee_{2,69}$	$\langle 1-(1-a)\mathrm{sg}(d-a)-b\overline{sg}(d-a)\mathrm{sg}(b-c), b\mathrm{sg}(b-c)\rangle$
$\wedge_{2,69}$	$\langle a\mathrm{sg}(a-d), 1-(1-b)\mathrm{sg}(c-b)-a\overline{sg}(c-b)\mathrm{sg}(a-d)\rangle$
$\vee_{2,70}$	$\langle \max(\overline{sg}(d), a), \min(\mathrm{sg}(d), b)\rangle$
$\wedge_{2,70}$	$\langle \min(\mathrm{sg}(c), a), \max(\overline{sg}(c), b)\rangle$
$\vee_{2,71}$	$\langle \max(c, a), \min(dc+d^2, b)\rangle$
$\wedge_{2,71}$	$\langle \min(cd+c^2, a), \max(b, d)\rangle$

$\vee_{2,72}$	$\langle \max(a,c), \min(1-c,b)\rangle$
$\wedge_{2,72}$	$\langle \min(1-d,a), \max(b,d)\rangle$
$\vee_{2,73}$	$\langle \max(1-\max(\mathrm{sg}(d),\mathrm{sg}(1-c)),a), \min(\mathrm{sg}(1-c),b)\rangle$
$\wedge_{2,73}$	$\langle \min(\mathrm{sg}(1-d),a), \max(1-\max(\mathrm{sg}(c),\mathrm{sg}(1-d)),b)\rangle$
$\vee_{2,74}$	$\langle \max(\overline{sg}(b),\overline{sg}(d)), \min(\mathrm{sg}(b),\mathrm{sg}(d))\rangle$
$\wedge_{2,74}$	$\langle \mathrm{sg}(\min(\overline{sg}(b),\overline{sg}(d))), \overline{sg}(\min(\overline{sg}(b),\overline{sg}(d)))\rangle$
$\vee_{2,75}$	$\langle \max\min(1, cd^2+c^2(d+1))(\min(1, cd^2$ $+c^2(d+1))+d(d+c)), (a^2b+ab^2+a^2)(b^2+ab$ $+a^2b+ab^2+a^2)), \min(\min(1, d(d+c)(r^2+d(d+c)))$ $.(\min(1, cd^2+c^2(d+1))(\min(1,$ $cd^2+c^2(d+1))+d(d+c))),$ $(b^2+ab)((a^2b+ab^2+a^2)^2+b^2+ab)$ $+(b^2+ab)(a^2b+ab^2+a^2))\rangle$
$\wedge_{2,75}$	$\langle \min((cd^2+c^2+c^2d)(d^2+cd+cd^2+c^2+c^2d),$ $(ab^2+a^2b+a^2)(ab^2+a^2b+a^2+b^2+ab)((b^2+a)^2$ $[(b^2+a)(ab^2+a^2b+a^2+1)+(ab^2+a^2b+a^2)^2]^2$ $+(ab^2+a^2b+a^2)(ab^2+a^2b+a^2+b^2+ab))+(ab^2$ $+a^2b+a^2)(ab^2+a^2b+a^2+b^2+ab)(b^2+a)[(b^2+a)$ $.(ab^2+a^2b+a^2+1)+(ab^2+a^2b+a^2)^2])^2+\max(d^2+$ $cd, (b^2+a)[(b^2+a)(ab^2+a^2b+a^2+1)+(ab^2+a^2b$ $+a^2)^2]((ab^2+a^2b+a^2)(ab^2+a^2b+a^2+b^2+ab)$ $+(b^2+a)[(b^2+a)(ab^2+a^2b+a^2+1)+(ab^2+a^2b$ $+a^2)^2]))\min((cd^2+c^2+c^2d)(d^2+cd+cd^2+c^2+c^2d),$ $(ab^2+a^2b+a^2)(ab^2+a^2b+a^2+b^2+ab)((b^2+a)^2$ $[(b^2+a)(ab^2+a^2b+a^2+1)+(ab^2+a^2b+a^2)^2]^2$ $+(ab^2+a^2b+a^2)(ab^2+a^2b+a^2+b^2+ab))$ $+(ab^2+a^2b+a^2)(ab^2+a^2b+a^2+b^2+ab)(b^2$ $+a)[(b^2+a)(ab^2+a^2b+a^2+1)+(ab^2+a^2b+a^2)^2]),$ $\max(d^2+cd, (b^2+a)[(b^2+a)(ab^2+a^2b+a^2+1)+(ab^2$ $+a^2b+a^2)^2]((ab^2+a^2b+a^2)(ab^2+a^2b+a^2+b^2+ab)$ $+(b^2+a)[(b^2+a)(ab^2+a^2b+a^2+1)+(ab^2+a^2b$ $+a^2)^2]))^2\min((cd^2+c^2+c^2d)(d^2+cd+cd^2+c^2+c^2d),$ $(ab^2+a^2b+a^2)(ab^2+a^2b+a^2+b^2+ab)((b^2+a)^2$ $.[(b^2+a)(ab^2+a^2b+a^2+1)+(ab^2+a^2b+a^2)^2]^2$ $+(ab^2+a^2b+a^2)(ab^2+a^2b+a^2+b^2+ab))+(ab^2$ $+a^2b+a^2)(ab^2+a^2b+a^2+b^2+ab)(b^2+a)[(b^2+a)$

	$.(ab^2+a^2b+a^2+1)+(ab^2+a^2b+a^2)^2])+\max(d^2$ $+cd,(b^2+a)[(b^2+a)(ab^2+a^2b+a^2+1)+(ab^2+a^2b$ $+a^2)^2]((ab^2+a^2b+a^2)(ab^2+a^2b+a^2+b^2+ab)+(b^2$ $+a)[(b^2+a)(ab^2+a^2b+a^2+1)+(ab^2+a^2b+a^2)^2]))$ $.\min((cd^2+c^2+c^2d)(d^2+cd+cd^2+c^2+c^2d),$ $(ab^2+a^2b+a^2)(ab^2+a^2b+a^2+b^2+ab)((b^2+a)^2$ $[(b^2+a)(ab^2+a^2b+a^2+1)+(ab^2+a^2b+a^2)^2]^2$ $+(ab^2+a^2b+a^2)(ab^2+a^2b+a^2+b^2+ab))$ $+(ab^2+a^2b+a^2)(ab^2+a^2b+a^2+b^2+ab)(b^2$ $+a)[(b^2+a)(ab^2+a^2b+a^2+1)+(ab^2+a^2b+a^2)^2])^2$ $+\max(d^2+cd,(b^2+a)[(b^2+a)(ab^2+a^2b+a^2+1)$ $+(ab^2+a^2b+a^2)^2]((ab^2+a^2b+a^2)$ $(ab^2+a^2b+a^2+b^2+ab)+(b^2+a)[(b^2+a)$ $.(ab^2+a^2b+a^2+1)+(ab^2+a^2b+a^2)^2]))^2\rangle$
$\vee_{2,76}$	$\langle\max(c,a),1-\max(c,a)\rangle$
$\wedge_{2,76}$	$\langle 1-\max(1-c,1-a),\max(1-c,1-a)\rangle$
$\vee_{2,77}$	$\langle 1-\min(\mathrm{sg}(1-a),\mathrm{sg}(1-c)),\min(\mathrm{sg}(1-a),\mathrm{sg}(1-c))\rangle$
$\wedge_{2,77}$	$\langle\mathrm{sg}(\min(\overline{sg}(1-a),\overline{sg}(1-c))),\overline{sg}(\min(\overline{sg}(1-a),$ $\overline{sg}(1-c)))\rangle$
$\vee_{2,78}$	$\langle\max(\overline{sg}(1-c),a),\min(\mathrm{sg}(d),b)\rangle$
$\wedge_{2,78}$	$\langle\min(\mathrm{sg}(c),a),\max(\overline{sg}(1-d),b)\rangle$
$\vee_{2,79}$	$\langle\max(\overline{sg}(1-c),\overline{sg}(1-a)),\overline{sg}(\min(\mathrm{sg}(d),\mathrm{sg}(b)))\rangle$
$\wedge_{2,79}$	$\langle\mathrm{sg}(\min(\overline{sg}(1-c),\overline{sg}(1-a))),\overline{sg}(1-\max(\mathrm{sg}(d),\mathrm{sg}(b)))\rangle$
$\vee_{2,80}$	$\langle\max(\overline{sg}(1-c),a),\min(d,b)\rangle$
$\wedge_{2,80}$	$\langle\min(c,a),\max(\overline{sg}(1-d),b)\rangle$
$\vee_{2,81}$	$\langle\max(\overline{sg}(1-a),\overline{sg}((1-c))),\min(\overline{sg}(1-d),\overline{sg}(1-b))\rangle$
$\wedge_{2,81}$	$\langle\overline{sg}(1-\min(\overline{sg}(1-c),\overline{sg}(1-a))),$ $\overline{sg}(1-\max(\overline{sg}(1-b),\overline{sg}(1-d)))\rangle$
$\vee_{2,82}$	$\langle\max(c,\min(1-c,a)),\min(1-c,1-a)\rangle$
$\wedge_{2,82}$	$\langle 1-\max(1-c,\min(c,1-a)),\max(1-c,\min(c,1-a))\rangle$
$\vee_{2,83}$	$\langle\overline{sg}(\overline{sg}(a)+\overline{sg}(c)-1),\overline{sg}(a)\mathrm{sg}(\overline{sg}(a)+\overline{sg}(c)-1)\rangle$
$\wedge_{2,83}$	$\langle\mathrm{sg}(-\overline{sg}(a)+c),\overline{sg}(-\overline{sg}(a)+c)\rangle$
$\vee_{2,84}$	$\langle 1-(1-a)\mathrm{sg}(1-c-a),(1-a)\mathrm{sg}(1-c-a)\rangle$
$\wedge_{2,84}$	$\langle a\mathrm{sg}(c+a-1),1-a\mathrm{sg}(c+a-1)\rangle$
$\vee_{2,85}$	$\langle c+(1-c)^2a,(1-c)c+(1-c)^2\rangle$
$\wedge_{2,85}$	$\langle c-c^2(1-a),1-c+c^2(1-a)\rangle$

$\vee_{2,86}$	$\langle a\overline{sg}(c) + \mathrm{sg}(c)(\overline{sg}(1-a) + (c)\mathrm{sg}((1-c))),$ $(1-a)\overline{sg}(c) + (1-c)\mathrm{sg}(c)\mathrm{sg}(1-a)\rangle$
$\wedge_{2,86}$	$\langle 1-(1-a)\overline{sg}(1-c) + \mathrm{sg}(1-c)(\overline{sg}(a) + (1-c)\mathrm{sg}(c)),$ $(1-a)\overline{sg}(1-c) + \mathrm{sg}(1-c)(\overline{sg}(a) + (1-c)\mathrm{sg}(c))\rangle$
$\vee_{2,87}$	$\langle \max(\overline{sg}(1-c), a), \min(\mathrm{sg}(1-c), 1-a)\rangle$
$\wedge_{2,87}$	$\langle 1-\max(\overline{sg}(c), 1-a), \max(\overline{sg}(c), 1-a)\rangle$
$\vee_{2,88}$	$\langle \max(\overline{sg}(1-c), \overline{sg}(1-a)), \min((\mathrm{sg}(1-c)), \mathrm{sg}(1-a))\rangle$
$\wedge_{2,88}$	$\langle \mathrm{sg}(1-\max(\mathrm{sg}(1-c), \mathrm{sg}(1-a))),$ $\overline{sg}(1-\max(\mathrm{sg}(1-c), \mathrm{sg}(1-a)))\rangle$
$\vee_{2,89}$	$\langle \max(\overline{sg}((1-c)), a), \min(1-c, 1-a)\rangle$
$\wedge_{2,89}$	$\langle 1-\max(\overline{sg}(c), 1-a), \max(\overline{sg}(c), 1-a)\rangle$
$\vee_{2,90}$	$\langle \max(\mathrm{sg}(a), \mathrm{sg}(c)), \min(\overline{sg}(c), \overline{sg}(a))\rangle$
$\wedge_{2,90}$	$\langle \overline{sg}(\max(\overline{sg}(a), \mathrm{sg}(1-c))), \overline{sg}(1-\max(\overline{sg}(a), \mathrm{sg}(1-c)))\rangle$
$\vee_{2,91}$	$\langle \max((1-d), \min(d, 1-b)), 1-\max(1-b, (1-d))\rangle$
$\wedge_{2,91}$	$\langle 1-\max(b, d), \max(b, d)\rangle$
$\vee_{2,92}$	$\langle \overline{sg}(b-\overline{sg}(d)), \min(b, \mathrm{sg}(b-\overline{sg}(d)))\rangle$
$\wedge_{2,92}$	$\langle \overline{sg}(1-\min(1-b, \mathrm{sg}(b-\overline{sg}(1-d)))),$ $1-\min(1-b, \mathrm{sg}(b-\overline{sg}(1-d)))\rangle$
$\vee_{2,93}$	$\langle (1-\min(b, \mathrm{sg}(b+d-1)), \min(b, \mathrm{sg}(b+d-1))\rangle$
$\wedge_{2,93}$	$\langle \min(1-b, \mathrm{sg}(1-b-d)), 1-\min(1-b, \mathrm{sg}(1-b-d))\rangle$
$\vee_{2,94}$	$\langle (1-d) + d^2(1-b), d(1-d) + d^2 b\rangle$
$\wedge_{2,94}$	$\langle (1-d)d + (1-d)^2(1-b),$ $1-(1-d)d - (1-d)^2(1-b)\rangle$
$\vee_{2,95}$	$\langle \min(1-b, \overline{sg}((1-d))) + \mathrm{sg}((1-d))(\overline{sg}(b)$ $+\min((1-d), \mathrm{sg}(b))), \min(b, \overline{sg}((1-d)))$ $+\min(d, \mathrm{sg}((1-d)), \mathrm{sg}(b))\rangle$
$\wedge_{2,95}$	$\langle \min(b, \overline{sg}(d)) + \min(1-d, \mathrm{sg}(d), \mathrm{sg}(b)),$ $1-\min(b, \overline{sg}(d)) - \min(1-d, \mathrm{sg}(d), \mathrm{sg}(b))\rangle$
$\vee_{2,96}$	$\langle \max(\overline{sg}(d), 1-b), \min(\mathrm{sg}(b), d)\rangle$
$\wedge_{2,96}$	$\langle \min(\mathrm{sg}(1-b), 1-d), 1-\min(\mathrm{sg}(b), 1-d)\rangle$
$\vee_{2,97}$	$\langle \max(\overline{sg}(d), \overline{sg}(b)), \min(\mathrm{sg}(d), \mathrm{sg}(b))\rangle$
$\wedge_{2,97}$	$\langle \mathrm{sg}(\min(\overline{sg}(d), \overline{sg}(b))), \overline{sg}(\min(\overline{sg}(d), \overline{sg}(b)))\rangle$
$\vee_{2,98}$	$\langle \max(\overline{sg}(d), 1-b), 1-\max(1-b, 1-d)\rangle$
$\wedge_{2,98}$	$\langle 1-\max(b, d), \max(b, d)\rangle$
$\vee_{2,99}$	$\langle \max(\overline{sg}((d)), \overline{sg}(b)), \min(\mathrm{sg}(d), \mathrm{sg}(b))\rangle$
$\wedge_{2,99}$	$\langle \overline{sg}(1-\min(\overline{sg}(1-d), \mathrm{sg}(b))), \overline{sg}(\min(\overline{sg}(1-d), \mathrm{sg}(b)))\rangle$

$\vee_{2,100}$	$\langle \max(\min(a\mathrm{sg}(b), \mathrm{sg}(ab)), c\mathrm{sg}(cd)),$ $\min(b\mathrm{sg}(a), \mathrm{sg}(ab), d\mathrm{sg}(cd))\rangle$
$\wedge_{2,100}$	$\langle \min(a\mathrm{sg}(ab), \mathrm{sg}(ab^2), c\mathrm{sg}(d))\mathrm{sg}(\max(\min(b\mathrm{sg}(ab),$ $\mathrm{sg}(a^2b)), d\mathrm{sg}(c))), \max(\min(b\mathrm{sg}(ab), \mathrm{sg}(a^2b)),$ $d\mathrm{sg}(c))\mathrm{sg}(\min(a\mathrm{sg}(ab), \mathrm{sg}(ab^2), c\mathrm{sg}(d)))\rangle$
$\vee_{2,101}$	$\langle 0, 0\rangle$
$\wedge_{2,101}$	$\langle 0, 0\rangle$
$\vee_{2,102}$	$\langle 0, 0\rangle$
$\wedge_{2,102}$	$\langle 0, 0\rangle$
$\vee_{2,103}$	$\langle \max(\min(1 - \min(1 - a, \mathrm{sg}(a)), \mathrm{sg}(\min(1 - a, \mathrm{sg}(a)))),$ $1 - \min(\min(1 - c, \mathrm{sg}(c)), \mathrm{sg}(1 - \min(1 - c, \mathrm{sg}(c))))),$ $\min(\min(1 - a, \mathrm{sg}(a)), \mathrm{sg}(1 - \min(1 - a, \mathrm{sg}(a))),$ $\min(\min(1 - c, \mathrm{sg}(c)), \mathrm{sg}(1 - \min(1 - c, \mathrm{sg}(c)))))\rangle$
$\wedge_{2,103}$	$\langle \min(1 - \max(\min((1 - \min((1 - a), \mathrm{sg}(a))),$ $\mathrm{sg}(\min((1 - a), \mathrm{sg}(a)))), 1 - \min((c), \mathrm{sg}(1 - c))),$ $\mathrm{sg}(\max(\min((1 - \min((1 - a), \mathrm{sg}(a))),$ $\mathrm{sg}(\min((1 - a), \mathrm{sg}(a)))), 1 - \min((c), \mathrm{sg}(1 - c))))),$ $\min(\mathrm{sg}(1 - \max(\min((1 - \min((1 - a), \mathrm{sg}(a))),$ $\mathrm{sg}(\min((1 - a), \mathrm{sg}(a)))), 1 - \min((c), \mathrm{sg}(1 - c))))$ $, (\max(\min((1 - \min((1 - a), \mathrm{sg}(a))),$ $\mathrm{sg}(\min((1 - a), \mathrm{sg}(a)))), 1 - \min((c), \mathrm{sg}(1 - c)))))\rangle$
$\vee_{2,104}$	$\langle \min(1 - \min(1 - a, \mathrm{sg}(a)), \mathrm{sg}(\min(1 - a, \mathrm{sg}(a)))), 0\rangle$
$\wedge_{2,104}$	$\langle \min(1 - \min(1 - \min(1 - \min(1 - a, \mathrm{sg}(a))),$ $\mathrm{sg}(\min(1 - a, \mathrm{sg}(a)))), \mathrm{sg}(\min((1 - \min(1 - a, \mathrm{sg}(a))),$ $\mathrm{sg}(\min(1 - a, \mathrm{sg}(a))))), \mathrm{sg}(\min(1 - \min((1$ $- \min(1 - a, \mathrm{sg}(a))), \mathrm{sg}(\min(1 - a, \mathrm{sg}(a)))),$ $\mathrm{sg}(\min(1 - \min(1 - a, \mathrm{sg}(a)), \mathrm{sg}(\min(1 - a,$ $\mathrm{sg}(a))))))), 0\rangle$
$\vee_{2,105}$	$\langle a, 0\rangle$
$\wedge_{2,105}$	$\langle a, 0\rangle$
$\vee_{2,106}$	$\langle \max(\min(\min(b, \mathrm{sg}(1 - b)), \mathrm{sg}(1 - \min(1 - b, \mathrm{sg}(b)))),$ $\min(\min(\mathrm{sg}(d), 1 - d), \mathrm{sg}(1 - \min(\mathrm{sg}(d), 1 - d)))),$ $\min(1 - \min(1 - b, \mathrm{sg}(b)), \mathrm{sg}(\min(1 - b, \mathrm{sg}(b))),$ $1 - \min(\min(\mathrm{sg}(d), 1 - d), \mathrm{sg}(1 - \min(\mathrm{sg}(d), 1 - d))))\rangle$
$\wedge_{2,106}$	$\langle \min(\min(1 - \min(1 - \min(1 - b, \mathrm{sg}(b)), \mathrm{sg}(\min(1 - b, \mathrm{sg}(b)))),$ $\mathrm{sg}(\min(1 - \min(1 - b, \mathrm{sg}(b)), \mathrm{sg}(\min(1 - b, \mathrm{sg}(b)))),$

	$1-\min(1-d,\mathrm{sg}(d))))),\mathrm{sg}(1-\min(1-\min(1-\min(1-b,\mathrm{sg}(b)),$ $\mathrm{sg}(\min(1-b,\mathrm{sg}(b)))),\mathrm{sg}(\min(1-\min(1-b,\mathrm{sg}(b)),$ $\mathrm{sg}(\min(1-b,\mathrm{sg}(b)))),1-\min(1-d,\mathrm{sg}(d))))))),$ $\min(1-\min(1-\min(1-\min(1-b,\mathrm{sg}(b)),\mathrm{sg}(\min(1-b,\mathrm{sg}(b)))),$ $\mathrm{sg}(\min(1-\min(1-b,\mathrm{sg}(b)),\mathrm{sg}(\min(1-b,\mathrm{sg}(b)))),$ $1-\min(1-d,\mathrm{sg}(d))))),\mathrm{sg}(\min(1-\min(1-\min(1-b,\mathrm{sg}(b)),$ $\mathrm{sg}(\min(1-b,\mathrm{sg}(b)))),\mathrm{sg}(\min(1-\min(1-b,\mathrm{sg}(b)),$ $\mathrm{sg}(\min(1-b,\mathrm{sg}(b)))),1-\min(1-d,\mathrm{sg}(d)))))))\rangle$
$\vee_{2,107}$	$\langle 0,0\rangle$
$\wedge_{2,107}$	$\langle 0,0\rangle$
$\vee_{2,108}$	$\langle 0,0\rangle$
$\wedge_{2,108}$	$\langle \min(1-d,\mathrm{sg}(d)),0\rangle$
$\vee_{2,109}$	$\langle ab+\overline{sg}(1-a)+\min(\overline{sg}(1-b),cd+\overline{sg}(1-c)),$ $(ab+\overline{sg}(1-a))b+\min(\overline{sg}(1-b),d(cd+\overline{sg}(1-c))$ $+\overline{sg}(1-d))\rangle$
$\wedge_{2,109}$	$\langle((ab+\overline{sg}(1-a))((ab+\overline{sg}(1-a))b+\overline{sg}(1-b))$ $+\min(\overline{sg}(1-(ab+\overline{sg}(1-a))),(cd+\overline{sg}(1-c)))),$ $(((ab+\overline{sg}(1-a))b+\overline{sg}(1-b))+\min(\overline{sg}(1-(ab$ $+\overline{sg}(1-a))),d))((ab+\overline{sg}(1-a))((ab$ $+\overline{sg}(1-a))b+\overline{sg}(1-b))+\min(\overline{sg}(1$ $-(ab+\overline{sg}(1-a))),(cd+\overline{sg}(1-c))))$ $+\overline{sg}(1-((ab+\overline{sg}(1-a))b+\overline{sg}(1-b))$ $-\min(\overline{sg}(1-(ab+\overline{sg}(1-a))),d))\rangle$
$\vee_{2,110}$	$\langle\max(ab+\overline{sg}(1-a),cd+\overline{sg}(1-c)),$ $\min((ab+\overline{sg}(1-a))^2+\overline{sg}(-ab+\mathrm{sg}(1-a)),$ $d(cd+\overline{sg}(1-c))+\overline{sg}(1-d))\rangle$
$\wedge_{2,110}$	$\langle\min((ab+\overline{sg}(1-a))((ab+\overline{sg}(1-a))b+\overline{sg}(1-b))$ $+\overline{sg}(1-(ab+\overline{sg}(1-a))),(cd+\overline{sg}(1-c))),$ $+\overline{sg}(1-\max(((ab+\overline{sg}(1-a))b+\overline{sg}(1-b)),d))\rangle$
$\vee_{2,111}$	$\langle\max(ab+\overline{sg}(1-a),(cd+\overline{sg}(1-c))(d(cd+\overline{sg}(1-c))$ $\max(((ab+\overline{sg}(1-a))b+\overline{sg}(1-b)),$ $d).\min((ab+\overline{sg}(1-a))((ab+\overline{sg}(1-a))b$ $+\overline{sg}(1-b))+\overline{sg}(1-(ab+\overline{sg}(1-a))),(cd+\overline{sg}(1-c)))$ $+\overline{sg}(1-d))+\overline{sg}(1-c)),\min((ab+\overline{sg}(1-a))b$ $+\overline{sg}(1-b),d(cd+\overline{sg}(1-c))+\overline{sg}(1-d))\rangle$

$\wedge_{2,111}$	$\langle \min((ab+\overline{sg}(1-a))((ab+\overline{sg}(1-a))b+\overline{sg}(1-b))$ $+\overline{sg}(1-(ab+\overline{sg}(1-a))),(cd+\overline{sg}(1-c))((cd$ $+\overline{sg}(1-c))d+\overline{sg}(1-d))+\overline{sg}(1-(cd+\overline{sg}(1-c)))),$ $\max(((ab+\overline{sg}(1-a))b+\overline{sg}(1-b)),$ $(cd+\overline{sg}(1-c))d+\overline{sg}(1-d))$ $.\min((ab+\overline{sg}(1-a))((ab+\overline{sg}(1-a))b+$ $\overline{sg}(1-b))+\overline{sg}(1-(ab+\overline{sg}(1-a))),$ $(cd+\overline{sg}(1-c))((cd+\overline{sg}(1-c))d+\overline{sg}(1-d))$ $+\overline{sg}(1-(cd+\overline{sg}(1-c))))$ $+\overline{sg}(1-\max(((ab+\overline{sg}(1-a))b+\overline{sg}(1-b)),$ $(cd+\overline{sg}(1-c))d+\overline{sg}(1-d)))\rangle$
$\vee_{2,112}$	$\langle ab+\overline{sg}(1-a)+cd+\overline{sg}(1-c)-(ab$ $+\overline{sg}(1-a))(cd+\overline{sg}(1-c)),(ab+\overline{sg}(1-a))^2+\overline{sg}(-ab$ $+\mathrm{sg}(1-a))(d(cd+\overline{sg}(1-c))+\overline{sg}(1-d))\rangle$
$\wedge_{2,112}$	$\langle((ab+\overline{sg}(1-a))((ab+\overline{sg}(1-a))b+\overline{sg}(1-b))$ $+\overline{sg}(1-(ab+\overline{sg}(1-a)))(cd+\overline{sg}(1-c))),$ $(((ab+\overline{sg}(1-a))b+\overline{sg}(1-b))+d-((ab+\overline{sg}(1-a))b$ $+\overline{sg}(1-b))d)((ab+\overline{sg}(1-a))((ab$ $+\overline{sg}(1-a))b+\overline{sg}(1-b))+\overline{sg}(1-(ab+\overline{sg}(1-a)))(cd$ $+\overline{sg}(1-c)))+\overline{sg}(1-((ab$ $+\overline{sg}(1-a))b+\overline{sg}(1-b))-d+((ab$ $+\overline{sg}(1-a))b+\overline{sg}(1-b))d))\rangle$
$\vee_{2,113}$	$\langle ab+\overline{sg}(1-a)+cd-(ab+\overline{sg}(1-a))(cd+\overline{sg}(1-c)),$ $((ab+\overline{sg}(1-a))b+\overline{sg}(1-b))(d(cd+\overline{sg}(1-c))+\overline{sg}(1-d))\rangle$
$\wedge_{2,113}$	$\langle((ab+\overline{sg}(1-a))((ab+\overline{sg}(1-a))b+\overline{sg}(1-b))$ $+\overline{sg}(1-(ab+\overline{sg}(1-a))))((cd+\overline{sg}(1-c))((cd$ $+\overline{sg}(1-c))d+\overline{sg}(1-d))+\overline{sg}(1-(cd+\overline{sg}(1-c)))),$ $(((ab+\overline{sg}(1-a))b+\overline{sg}(1-b))+(cd$ $+\overline{sg}(1-c))d-((ab+\overline{sg}(1-a))b+\overline{sg}(1-b))((cd$ $+\overline{sg}(1-c))d+\overline{sg}(1-d)))((ab$ $+\overline{sg}(1-a))((ab+\overline{sg}(1-a))b+\overline{sg}(1-b))+\overline{sg}(1-(ab$ $+\overline{sg}(1-a))))((cd+\overline{sg}(1-c))((cd$ $+\overline{sg}(1-c))d+\overline{sg}(1-d))+\overline{sg}(1-(cd+\overline{sg}(1-c))))$ $+\overline{sg}(1-(((ab+\overline{sg}(1-a))b+\overline{sg}(1-b))$ $+(cd+\overline{sg}(1-c))d-((ab+\overline{sg}(1-a))b$ $+\overline{sg}(1-b))((cd+\overline{sg}(1-c))d+\overline{sg}(1-d))))\rangle$

$\vee_{2,114}$	$\langle a+\min(\overline{sg}(a),-c(1-c)+\mathrm{sg}(c)),$ $a(1-a)+\min(\overline{sg}(a),c(1-c)+\overline{sg}(c))\rangle$
$\wedge_{2,114}$	$\langle 1-a-\min(\overline{sg}(a),\mathrm{sg}(1-c)-c(1-c)),$ $(1-a-\min(\overline{sg}(a),\mathrm{sg}(1-c)-c(1-c)))$ $(a+\min(\overline{sg}(a),\mathrm{sg}(1-c)-c(1-c)))$ $+\overline{sg}((1-a-\min(\overline{sg}(a),\mathrm{sg}(1-c)-c(1-c))))\rangle$
$\vee_{2,115}$	$\langle 1-\min(1-a,c(1-c)+\overline{sg}(c)),$ $\min(a(1-a)+\overline{sg}(a),c(1-c)+\overline{sg}(c))\rangle$
$\wedge_{2,115}$	$\langle \min(1-a,c(1-c)+\overline{sg}(1-c)),$ $(1-\min(1-a,c(1-c)+\overline{sg}(1-c)))\min(1-a,$ $c(1-c)+\overline{sg}(1-c))+\overline{sg}(\min(1-a,c(1-c)$ $+\overline{sg}(1-c)))\rangle$
$\vee_{2,116}$	$\langle \max(a,(1-(c(1-c)+\overline{sg}(c)))(c(1-c)+\overline{sg}(c))$ $+\overline{sg}((c(1-c)+\overline{sg}(c)))),\min(a(1-a)+\overline{sg}(a),$ $(c(1-c)+\overline{sg}(c))((-c(1-c)+\mathrm{sg}(c)))(c(1-c)$ $+\overline{sg}(c))+\overline{sg}((c(1-c)+\overline{sg}(c))))$ $+\overline{sg}(-c(1-c)+\mathrm{sg}(c))\rangle$
$\wedge_{2,116}$	$\langle 1-\max(a,(1-c(1-c)-\overline{sg}(1-c))(c(1-c)$ $+\overline{sg}(1-c))+\overline{sg}(c(1-c)+\overline{sg}(1-c))),$ $(1-\max(a,(1-c(1-c)-\overline{sg}(1-c))(c(1-c)$ $+\overline{sg}(1-c))+\overline{sg}(c(1-c)+\overline{sg}(1-c))))$ $.\max(a,(1-c(1-c)-\overline{sg}(1-c))(c(1-c)$ $+\overline{sg}(1-c))+\overline{sg}(c(1-c)+\overline{sg}(1-c)))$ $\overline{sg}(1-\max(a,(1-c(1-c)-\overline{sg}(1-c))(c(1-c)$ $+\overline{sg}(1-c))+\overline{sg}(c(1-c)+\overline{sg}(1-c))))\rangle$
$\vee_{2,117}$	$\langle a-a(c(1-c)+\overline{sg}(c)),$ $(a(1-a)+\overline{sg}(a))(c(1-c)+\overline{sg}(c))\rangle$
$\wedge_{2,117}$	$\langle 1-a+a(c(1-c)+\overline{sg}(1-c)),$ $(1-a+a(c(1-c)+\overline{sg}(1-c)))(a-a(c(1-c)$ $+\overline{sg}(1-c)))+\overline{sg}(1-a+a(c(1-c)+\overline{sg}(1-c)))\rangle$
$\vee_{2,118}$	$\langle a+(-c(1-c)+\mathrm{sg}(c))(c(1-c)+\overline{sg}(c))$ $-a((-c(1-c)+\mathrm{sg}(c))(c(1-c)+\overline{sg}(c))+\overline{sg}((c(1-c)$ $+\overline{sg}(c)))),(a(1-a)+\overline{sg}(a))(c(1-c)$ $+\overline{sg}(c))((-c(1-c)+\mathrm{sg}(c))(c(1-c)+\overline{sg}(c))$ $+\overline{sg}((c(1-c)+\overline{sg}(c))))+\overline{sg}(-c(1-c)+\mathrm{sg}(c))\rangle$

$\wedge_{2,118}$	$\langle a-(1-(c-c^2+\overline{sg}(1-c)))(c-c^2+\overline{sg}(1-c))$ $-(1-a)((1-(c-c^2+\overline{sg}(1-c)))(c-c^2+\overline{sg}(1-c))$ $+\overline{sg}((c-c^2+\overline{sg}(1-c)))), (1-a+(1-(c-c^2$ $+\overline{sg}(1-c)))(c-c^2+\overline{sg}(1-c))-(1-a)((1-(c-c^2$ $+\overline{sg}(1-c)))(c-c^2+\overline{sg}(1-c))+\overline{sg}((c-c^2$ $+\overline{sg}(1-c)))))(a-(1-(c-c^2+\overline{sg}(1-c)))(c$ $-c^2+\overline{sg}(1-c))-(1-a)((1-(c-c^2+\overline{sg}(1-c)))(c$ $-c^2+\overline{sg}(1-c))+\overline{sg}((c-c^2+\overline{sg}(1-c)))))$ $+\overline{sg}(a-(1-(c-c^2+\overline{sg}(1-c)))(c-c^2+\overline{sg}(1-c))$ $-(1-a)((1-(c-c^2+\overline{sg}(1-c)))(c-c^2$ $+\overline{sg}(1-c))+\overline{sg}((c-c^2+\overline{sg}(1-c)))))\rangle$
$\vee_{2,119}$	$\langle b(1-b)+\overline{sg}(b)+\min(\overline{sg}(b(1-b)+\overline{sg}(b)), d(1-d)$ $+\overline{sg}(d)), (\mathrm{sg}(b-b(1-b)))(b(1-b)+\overline{sg}(b))+$ $\min(\overline{sg}(b(1-b)+\overline{sg}(b)), -d(1-d)+\mathrm{sg}(d))\rangle$
$\wedge_{2,119}$	$\langle(1-(b(1-b)+\overline{sg}(b))(b(1-b)+\mathrm{sg}(b))+\overline{sg}(b(1-b)$ $+\overline{sg}(b)))(b(1-b)+\overline{sg}(b))(b(1-b)+\mathrm{sg}(b))$ $+\overline{sg}(b(1-b)+\overline{sg}(b))+\min(\overline{sg}((b(1-b)$ $+\overline{sg}(b))(b(1-b)+\mathrm{sg}(b))+\overline{sg}(b(1-b)$ $+\overline{sg}(b))), 1-d), ((1-(b(1-b)+\overline{sg}(b))(b(1-b)$ $+\mathrm{sg}(b))+\overline{sg}(b(1-b)+\overline{sg}(b)))(b(1-b)$ $+\overline{sg}(b))(b(1-b)+\mathrm{sg}(b))+\overline{sg}(b(1-b)$ $+\overline{sg}(b))+\min(\overline{sg}((b(1-b)+\overline{sg}(b))(b(1-b)$ $+\mathrm{sg}(b))+\overline{sg}(b(1-b)+\overline{sg}(b))), 1-d))(1$ $-(1-(b(1-b)+\overline{sg}(b))(b(1-b)+\mathrm{sg}(b))$ $+\overline{sg}(b(1-b)+\overline{sg}(b)))(b(1-b)+\overline{sg}(b))(b(1-b)$ $+\mathrm{sg}(b))+\overline{sg}(b(1-b)+\overline{sg}(b))-\min(\overline{sg}((b(1-b)$ $+\overline{sg}(b))(b(1-b)+\mathrm{sg}(b))+\overline{sg}(b(1-b)$ $+\overline{sg}(b))), 1-d))+\overline{sg}((1-(b(1-b)+\overline{sg}(b))(b(1-b)$ $+\mathrm{sg}(b))+\overline{sg}(b(1-b)+\overline{sg}(b)))(b(1-b)$ $+\overline{sg}(b))(b(1-b)+\mathrm{sg}(b))+\overline{sg}(b(1-b)+\overline{sg}(b))$ $+\min(\overline{sg}((b(1-b)+\overline{sg}(b))(b(1-b)+\mathrm{sg}(b))$ $+\overline{sg}(b(1-b)+\overline{sg}(b))), 1-d))\rangle$
$\vee_{2,120}$	$\langle\max(b(1-b)+\overline{sg}(b), d(1-d)+\overline{sg}(d)),$ $\min((-b(1-b)+\mathrm{sg}(b))(b(1-b)+\overline{sg}(b))+$ $\overline{sg}((b(1-b)+\overline{sg}(b))), -d(1-d)+\mathrm{sg}(d))\rangle$
$\wedge_{2,120}$	$\langle\min((1-(b(1-b)+\overline{sg}(b))(b(1-b)+\mathrm{sg}(b))$ $+\overline{sg}(b(1-b)+\overline{sg}(b)))(b(1-b)+\overline{sg}(b))(b(1-b)+\mathrm{sg}(b))$

	$+\overline{sg}(b(1-b)+\overline{sg}(b))+\overline{sg}((b(1-b)+\overline{sg}(b))(b(1-b)$ $+\mathrm{sg}(b))+\overline{sg}(b(1-b)+\overline{sg}(b))),1-d),(1-\min((1$ $-(b(1-b)+\overline{sg}(b))(b(1-b)+\mathrm{sg}(b))+\overline{sg}(b(1-b)$ $+\overline{sg}(b)))(b(1-b)+\overline{sg}(b))(b(1-b)+\mathrm{sg}(b))+\overline{sg}(b(1-b)$ $+\overline{sg}(b))+\overline{sg}((b(1-b)+\overline{sg}(b))(b(1-b)$ $+\mathrm{sg}(b))+\overline{sg}(b(1-b)+\overline{sg}(b))),1-d))$ $\min((1-(b(1-b)+\overline{sg}(b))(b(1-b)+\mathrm{sg}(b))$ $+\overline{sg}(b(1-b)+\overline{sg}(b)))(b(1-b)+\overline{sg}(b))(b(1-b)$ $+\mathrm{sg}(b))+\overline{sg}(b(1-b)+\overline{sg}(b))$ $+\overline{sg}((b(1-b)+\overline{sg}(b))(b(1-b)+\mathrm{sg}(b))+\overline{sg}(b(1-b)$ $+\overline{sg}(b))),1-d)+\overline{sg}(\min((1-(b(1-b)+\overline{sg}(b))(b(1-b)$ $+\mathrm{sg}(b))+\overline{sg}(b(1-b)+\overline{sg}(b)))(b(1-b)$ $+\overline{sg}(b))(b(1-b)+\mathrm{sg}(b))+\overline{sg}(b(1-b)+\overline{sg}(b))$ $+\overline{sg}((b(1-b)+\overline{sg}(b))(b(1-b)+\mathrm{sg}(b))+\overline{sg}(b(1-b)$ $+\overline{sg}(b))),1-d))\rangle$
$\vee_{2,121}$	$\langle\max(b(1-b)+\overline{sg}(b),(d(1-d)+\overline{sg}(d))(1-(d(1-d)$ $+\overline{sg}(d)))+\overline{sg}(1-(d(1-d)+\overline{sg}(d)))),$ $\min((-b(1-b)+\mathrm{sg}(b))(b(1-b)+\overline{sg}(b))+\overline{sg}(b(1-b)$ $+\overline{sg}(b)),(1-(d(1-d)+\overline{sg}(d)))((d(1-d)+\overline{sg}(d))$ $.(1-(d(1-d)+\overline{sg}(d)))+\overline{sg}(1-(d(1-d)+\overline{sg}(d)))))$ $+\overline{sg}((d(1-d)+\overline{sg}(d)))\rangle$
$\wedge_{2,121}$	$\langle\min((1-(b(1-b)+\overline{sg}(b))(b(1-b)+\mathrm{sg}(b))$ $+\overline{sg}(b(1-b)+\overline{sg}(b)))(b(1-b)+\overline{sg}(b))(b(1-b)+\mathrm{sg}(b))$ $+\overline{sg}(b(1-b)+\overline{sg}(b))+\overline{sg}((b(1-b)+\overline{sg}(b))(b(1-b)$ $+\mathrm{sg}(b))+\overline{sg}(b(1-b)+\overline{sg}(b))),(1-d)(d(1-d)$ $+\overline{sg}(1-d)))+\overline{sg}(d),(1-\min((1-(b(1-b)+\overline{sg}(b))$ $(b(1-b)+\mathrm{sg}(b))+\overline{sg}(b(1-b)+\overline{sg}(b)))(b(1-b)$ $+\overline{sg}(b))(b(1-b)+\mathrm{sg}(b))+\overline{sg}(b(1-b)+\overline{sg}(b))$ $+\overline{sg}((b(1-b)+\overline{sg}(b))(b(1-b)+\mathrm{sg}(b))+\overline{sg}(b(1-b)$ $+\overline{sg}(b))),(1-d)(d(1-d)+\overline{sg}(1-d)))-\overline{sg}(d))$ $.(\min((1-(b(1-b)+\overline{sg}(b))(b(1-b)+\mathrm{sg}(b))$ $+\overline{sg}(b(1-b)+\overline{sg}(b)))(b(1-b)+\overline{sg}(b))(b(1-b)$ $+\mathrm{sg}(b))+\overline{sg}(b(1-b)+\overline{sg}(b))+\overline{sg}((b(1-b)+\overline{sg}(b))$ $.(b(1-b)+\mathrm{sg}(b))+\overline{sg}(b(1-b)+\overline{sg}(b))),$ $(1-d)(d(1-d)+\overline{sg}(1-d)))+\overline{sg}(d))$ $+\overline{sg}(\min((1-(b(1-b)+\overline{sg}(b))(b(1-b)+\mathrm{sg}(b))$ $+\overline{sg}(b(1-b)+\overline{sg}(b)))(b(1-b)+\overline{sg}(b))(b(1-b)$

	$+\mathrm{sg}(b)) + \overline{sg}(b(1-b) + \overline{sg}(b)) + \overline{sg}((b(1-b) + \overline{sg}(b))$ $.(b(1-b) + \mathrm{sg}(b)) + \overline{sg}(b(1-b) + \overline{sg}(b))), (1-d)$ $.(d(1-d) + \overline{sg}(1-d))) + \overline{sg}(d))\rangle$
$\vee_{2,122}$	$\langle b(1-b) + \overline{sg}(b) + (d(1-d) + \overline{sg}(d))$ $-(b(1-b) + \overline{sg}(b))(d(1-d) + \overline{sg}(d)), ((1-(d(1-d)$ $+\overline{sg}(d)))(b(1-b) + \overline{sg}(b)) + \overline{sg}(b(1-b)$ $+\overline{sg}(b)))(1-(d(1-d) + \overline{sg}(d)))\rangle$
$\wedge_{2,122}$	$\langle((1-d)(b(1-b) + \overline{sg}(b))(b(1-b)$ $+\mathrm{sg}(b)) + \overline{sg}(b(1-b) + \overline{sg}(b)) + \overline{sg}((b(1-b)$ $+\overline{sg}(b))(b(1-b) + \mathrm{sg}(b)) + \overline{sg}(b(1-b)$ $+\overline{sg}(b))))(1-d), (1-((1-d)(b(1-b)+$ $+\overline{sg}(b))(b(1-b) + \mathrm{sg}(b)) + \overline{sg}(b(1-b) + \overline{sg}(b))$ $+\overline{sg}((b(1-b) + \overline{sg}(b))(b(1-b) + \mathrm{sg}(b))$ $+\overline{sg}(b(1-b) + \overline{sg}(b))))(1-d))((1-d)(b(1-b)$ $+\overline{sg}(b))(b(1-b) + \mathrm{sg}(b)) + \overline{sg}(b(1-b) + \overline{sg}(b))$ $+\overline{sg}((b(1-b) + \overline{sg}(b))(b(1-b)$ $+\mathrm{sg}(b)) + \overline{sg}(b(1-b) + \overline{sg}(b))))(1-d)$ $+\overline{sg}(((1-d)(b(1-b) + \overline{sg}(b))(b(1-b)$ $+\mathrm{sg}(b)) + \overline{sg}(b(1-b) + \overline{sg}(b)) + \overline{sg}((b(1-b)$ $+\overline{sg}(b))(b(1-b) + \mathrm{sg}(b)) + \overline{sg}(b(1-b) + \overline{sg}(b))))(1-d))\rangle$
$\vee_{2,123}$	$\langle b + (d(1-d) + \overline{sg}(d))(1-(d(1-d) + \overline{sg}(d)))$ $-(b(1-b) + \overline{sg}(b))((d(1-d) + \overline{sg}(d))(1$ $-(d(1-d) + \overline{sg}(d))) - \overline{sg}(1-(d(1-d) + \overline{sg}(d)))),$ $((-b(1-b) + \mathrm{sg}(b))(b(1-b) + \overline{sg}(b)) + \overline{sg}(b(1-b)$ $+\overline{sg}(b)))(((1-(d(1-d) + \overline{sg}(d)))((d(1-d)$ $+\overline{sg}(d))(1-(d(1-d) + \overline{sg}(d))) + \overline{sg}(1-(d(1-d)$ $+\overline{sg}(d))))) + \overline{sg}((d(1-d) + \overline{sg}(d))))\rangle$
$\wedge_{2,123}$	$\langle((1-(b(1-b) + \overline{sg}(b))(b(1-b) + \mathrm{sg}(b))$ $+\overline{sg}(b(1-b) + \overline{sg}(b)))(b(1-b) + \overline{sg}(b))(b(1-b)$ $+\mathrm{sg}(b)) + \overline{sg}(b(1-b) + \overline{sg}(b)) + \overline{sg}((b(1-b)$ $+\overline{sg}(b))(b(1-b) + \mathrm{sg}(b)) + \overline{sg}(b(1-b)$ $+\overline{sg}(b))))(((1-d)(d(1-d) + \overline{sg}(1-d)))$ $+\overline{sg}(d)), (1-((1-(b(1-b) + \overline{sg}(b))(b(1-b)$ $+\mathrm{sg}(b)) + \overline{sg}(b(1-b) + \overline{sg}(b)))(b(1-b)$ $+\overline{sg}(b))(b(1-b) + \mathrm{sg}(b)) + \overline{sg}(b(1-b) + \overline{sg}(b))$ $+\overline{sg}((b(1-b) + \overline{sg}(b))(b(1-b) + \mathrm{sg}(b))$ $+\overline{sg}(b(1-b) + \overline{sg}(b))))(((1-d)(d(1-d)$

	$+\overline{sg}(1-d))) + \overline{sg}(d))).((1-(b(1-b)$ $+\overline{sg}(b))(b(1-b)+\mathrm{sg}(b)) + \overline{sg}(b(1-b)$ $+\overline{sg}(b)))(b(1-b)+\overline{sg}(b))(b(1-b)+\mathrm{sg}(b))$ $+\overline{sg}(b(1-b)+\overline{sg}(b)) + \overline{sg}((b(1-b)$ $+\overline{sg}(b))(b(1-b)+\mathrm{sg}(b)) + \overline{sg}(b(1-b)$ $+\overline{sg}(b))))(((1-d)(d(1-d)+\overline{sg}(1-d))) + \overline{sg}(d))$ $+\overline{sg}(((1-(b(1-b)+\overline{sg}(b))(b(1-b)+\mathrm{sg}(b))$ $+\overline{sg}(b(1-b)+\overline{sg}(b)))(b(1-b)+\overline{sg}(b))(b(1-b)$ $+\mathrm{sg}(b)) + \overline{sg}(b(1-b)+\overline{sg}(b)) + \overline{sg}((b(1-b)$ $+\overline{sg}(b))(b(1-b)+\mathrm{sg}(b)) + \overline{sg}(b(1-b)$ $+\overline{sg}(b))))(((1-d)(d(1-d)+\overline{sg}(1-d))) + \overline{sg}(d)))\rangle$
$\vee_{2,124}$	$\langle c+\min(\overline{sg}(1-d),a), cd+\min(\overline{sg}(1-d),b)\rangle$
$\wedge_{2,124}$	$\langle cd+\min(\overline{sg}(1-c),a), d+\min(\overline{sg}(1-c),b)\rangle$
$\vee_{2,125}$	$\langle \max(a,c), \min(cd+\overline{sg}(1-d),b)\rangle$
$\wedge_{2,125}$	$\langle \min(cd+\overline{sg}(1-c),a), \max(b,d)\rangle$
$\vee_{2,126}$	$\langle \max(c,(ab+\overline{sg}(1-b))a(ab+\overline{sg}(1-b)$ $+\overline{sg}(1-a)) + \overline{sg}(1-a(ab+\overline{sg}(1-b)+\overline{sg}(1-a)))),$ $\min(cd+\overline{sg}(1-d),(ab+\overline{sg}(1-b))((ab$ $+\overline{sg}(1-b))a(ab+\overline{sg}(1-b)+\overline{sg}(1-a))$ $+\overline{sg}(1-a(ab+\overline{sg}(1-b)+\overline{sg}(1-a))))$ $+\overline{sg}(1-(ab+\overline{sg}(1-b))))\rangle$
$\wedge_{2,126}$	$\langle(\max(cd+\overline{sg}(1-d),((ab+\overline{sg}(1-b))b+\overline{sg}(1-b))a(ab$ $+\overline{sg}(1-b)+\overline{sg}(1-a)) + \overline{sg}(1-a(ab+\overline{sg}(1-b)$ $+\overline{sg}(1-a)))),\min((cd+\overline{sg}(1-d))c(cd$ $+\overline{sg}(1-d)+\overline{sg}(1-c)) + \overline{sg}(1-c(cd+\overline{sg}(1-d)$ $+\overline{sg}(1-c))),((ab+\overline{sg}(1-b))b$ $+\overline{sg}(1-b))(((ab+\overline{sg}(1-b))b$ $+\overline{sg}(1-b))a(ab+\overline{sg}(1-b)+\overline{sg}(1-a))$ $+\overline{sg}(1-a(ab+\overline{sg}(1-b)+\overline{sg}(1-a))))$ $+\overline{sg}(1-((ab+\overline{sg}(1-b))b+\overline{sg}(1-b)))))),$ $\max(cd+\overline{sg}(1-d),((ab+\overline{sg}(1-b))b$ $+\overline{sg}(1-b))a(ab+\overline{sg}(1-b)+\overline{sg}(1-a))$ $+\overline{sg}(1-a(ab+\overline{sg}(1-b)+\overline{sg}(1-a)))),$ $\min((cd+\overline{sg}(1-d))c(cd+\overline{sg}(1-d)$ $+\overline{sg}(1-c)) + \overline{sg}(1-c(cd+\overline{sg}(1-d)$ $+\overline{sg}(1-c))),((ab+\overline{sg}(1-b))b$ $+\overline{sg}(1-b))(((ab+\overline{sg}(1-b))b$

	$+\overline{sg}(1-b))a(ab+\overline{sg}(1-b)+\overline{sg}(1-a))$ $+\overline{sg}(1-a(ab+\overline{sg}(1-b)+\overline{sg}(1-a))))$ $+\overline{sg}(1-((ab+\overline{sg}(1-b))b+\overline{sg}(1-b)))))\rangle$
$\vee_{2,127}$	$\langle a+c-ac,(cd+\overline{sg}(1-d))b\rangle$
$\wedge_{2,127}$	$\langle(cd+\overline{sg}(1-c))a,b+d-bd\rangle$
$\vee_{2,128}$	$\langle c+ab(cd+\overline{sg}(1-d))(a(ab+\overline{sg}(1-b))$ $+\overline{sg}(1-a))-c(ab(cd+\overline{sg}(1-d))(a(ab+\overline{sg}(1-b))$ $+\overline{sg}(1-a))+\overline{sg}(1-(cd+\overline{sg}(1-d))(a(ab+\overline{sg}(1-b))$ $+\overline{sg}(1-a)))),(cd+\overline{sg}(1-d))(ab(ab(cd$ $+\overline{sg}(1-d))(a(ab+\overline{sg}(1-b))+\overline{sg}(1-a))$ $+\overline{sg}(1-(cd+\overline{sg}(1-d))(a(ab+\overline{sg}(1-b))$ $+\overline{sg}(1-a))))+\overline{sg}(1-ab))\rangle$
$\wedge_{2,128}$	$\langle(c+ab(cd+\overline{sg}(1-d))(a(ab+\overline{sg}(1-b))$ $+\overline{sg}(1-a))-c(ab(cd+\overline{sg}(1-d))(a(ab+\overline{sg}(1-b))$ $+\overline{sg}(1-a))+\overline{sg}(1-(cd+\overline{sg}(1-d))(a(ab+\overline{sg}(1-b))$ $+\overline{sg}(1-a)))))(cd+\overline{sg}(1-d))(ab(ab(cd+\overline{sg}(1-d))$ $.(a(ab+\overline{sg}(1-b))+\overline{sg}(1-a))+\overline{sg}(1-(cd$ $+\overline{sg}(1-d))(a(ab+\overline{sg}(1-b))+\overline{sg}(1-a))))$ $+\overline{sg}(1-ab)),(c+ab(cd+\overline{sg}(1-d))(a(ab+\overline{sg}(1-b))$ $+\overline{sg}(1-a))-c(ab(cd+\overline{sg}(1-d))(a(ab+\overline{sg}(1-b))$ $+\overline{sg}(1-a))+\overline{sg}(1-(cd+\overline{sg}(1-d))(a(ab+\overline{sg}(1-b))$ $+\overline{sg}(1-a)))))^2(cd+\overline{sg}(1-d))(ab(ab(cd+\overline{sg}(1-d))$ $.(a(ab+\overline{sg}(1-b))+\overline{sg}(1-a))+\overline{sg}(1-(cd+\overline{sg}(1-d))$ $.(a(ab+\overline{sg}(1-b))+\overline{sg}(1-a))))+\overline{sg}(1-ab))(c+ab(cd$ $+\overline{sg}(1-d))(a(ab+\overline{sg}(1-b))+\overline{sg}(1-a))-c(ab(cd$ $+\overline{sg}(1-d))(a(ab+\overline{sg}(1-b))+\overline{sg}(1-a))+\overline{sg}(1$ $-(cd+\overline{sg}(1-d))(a(ab+\overline{sg}(1-b))+\overline{sg}(1-a)))))\overline{sg}(1$ $-(cd+\overline{sg}(1-d))(ab(ab(cd+\overline{sg}(1-d))(a(ab+\overline{sg}(1-b))$ $+\overline{sg}(1-a))+\overline{sg}(1-(cd+\overline{sg}(1-d))(a(ab$ $+\overline{sg}(1-b))+\overline{sg}(1-a))))+\overline{sg}(1-ab)))\rangle$
$\vee_{2,129}$	$\langle c+\min(\overline{sg}(c),a),(1-c)c+\min(\overline{sg}(c),1-a)\rangle$
$\wedge_{2,129}$	$\langle c-\min(\overline{sg}(1-c),1-a),1-c+\min(\overline{sg}(1-c),1-a)\rangle$
$\vee_{2,130}$	$\langle 1-\min(1-c,1-a),\min((1-c)c+\overline{sg}(c),1-a)\rangle$
$\wedge_{2,130}$	$\langle\min(a,c),1-\min(c,a)\rangle$
$\vee_{2,131}$	$\langle\max(1-d,(1-(a(1-a)+\overline{sg}(a)))(a(1-a)+\overline{sg}(a))$ $+\overline{sg}((a(1-a)+\overline{sg}(a)))),\min(d(1-d)+\overline{sg}(1-d),$ $(a(1-a)+\overline{sg}(a))((1-(a(1-a)+\overline{sg}(a)))(a(1-a)$

	$+\overline{sg}(a)) + \overline{sg}((a(1-a) + \overline{sg}(a))))$ $+\overline{sg}(1 - (a(1-a) + \overline{sg}(a))))\rangle$
$\wedge_{2,131}$	$\langle \max(1-c, (1-(a(1-a)+\overline{sg}(a)))(a(1-a)+\overline{sg}(a))$ $+\overline{sg}((a(1-a)+\overline{sg}(a)))) - \max(1-c, (1-(a(1-a)$ $+\overline{sg}(a)))(a(1-a)+\overline{sg}(a)) + \overline{sg}((a(1-a)+\overline{sg}(a))))^2$ $+\overline{sg}(\max(1-c, (1-(a(1-a)+\overline{sg}(a)))(a(1-a)$ $+\overline{sg}(a)) + \overline{sg}((a(1-a)+\overline{sg}(a))))), \max(1-c, (1$ $-(a(1-a)+\overline{sg}(a)))(a(1-a)+\overline{sg}(a)) + \overline{sg}((a(1-a)$ $+\overline{sg}(a))))^2 - \max(1-c, (1-(a(1-a)+\overline{sg}(a)))(a(1-a)$ $+\overline{sg}(a)) + \overline{sg}((a(1-a)+\overline{sg}(a))))^3 + \overline{sg}(1 - \max(1-c,$ $(1-(a(1-a)+\overline{sg}(a)))(a(1-a)+\overline{sg}(a)) + \overline{sg}((a(1-a)$ $+\overline{sg}(a))))) + a\overline{sg}(\max(1-c, (1-(a(1-a)+\overline{sg}(a)))$ $.(a(1-a)+\overline{sg}(a)) + \overline{sg}((a(1-a)+\overline{sg}(a)))))\rangle$
$\vee_{2,132}$	$\langle 1-(1-a)(1-c), ((1-c)c+\overline{sg}(c))(1-a)\rangle$
$\wedge_{2,132}$	$\langle ac, 1-ac\rangle$
$\vee_{2,133}$	$\langle 1-d+a(1-a)(1-a(1-a)) - (1-d)(a(1-a)$ $.(1-a(1-a)) + \overline{sg}(a(1-a))), (d(1-d)+\overline{sg}(1-d))$ $.((1-a)a(a(1-a)(1-a(1-a)) + \overline{sg}(a(1-a)))$ $+\overline{sg}(1-a(1-a)))\rangle$
$\wedge_{2,133}$	$\langle 1-c+a(1-a)(1-a(1-a)) - (1-c)(a(1-a)(1-a$ $.(1-a)) + \overline{sg}(a(1-a))) - (1-c+a(1-a)(1-a(1-a))$ $-(1-c)(a(1-a)(1-a(1-a)) + \overline{sg}(a(1-a))))^2, (1-c$ $+a(1-a)(1-a(1-a)) - (1-c)(a(1-a)(1-a(1-a))$ $+\overline{sg}(a(1-a))))^2 - (1-c+a(1-a)(1-a(1-a))$ $-(1-c)(a(1-a)(1-a(1-a)) + \overline{sg}(a(1-a))))^3$ $+(1-c+a(1-a)(1-a(1-a)) - (1-c)(a(1-a)(1-a$ $.(1-a)) + \overline{sg}(a(1-a))))\overline{sg}(1-c+a(1-a)(1-a(1-a))$ $-(1-c)(a(1-a)(1-a(1-a)) + \overline{sg}(a(1-a))))$ $+\overline{sg}(d-a(1-a)(1-a(1-a)) + (1-d)(a(1-a)(1$ $-a(1-a)) + \overline{sg}(a(1-a))))\rangle$
$\vee_{2,134}$	$\langle (1-d) + \min(\overline{sg}((1-d)), 1-b),$ $(d)(1-d) + \min(\overline{sg}((1-d)), (b))\rangle$
$\wedge_{2,134}$	$\langle (1-d)d + \min(\overline{sg}(d), 1-b),$ $1-(1-d)d - \min(\overline{sg}(d), 1-b)\rangle$
$\vee_{2,135}$	$\langle \max(1-b, 1-d), \min(d(1-d)+\overline{sg}((1-d)), b)\rangle$
$\wedge_{2,135}$	$\langle \min((1-d)d+\overline{sg}(d), 1-b),$ $1-\min((1-d)d+\overline{sg}(d), 1-b)\rangle$

$\vee_{2,136}$	$\langle \max(c,((1-b)(b(1-b)+\overline{sg}(1-b))+\overline{sg}(b))(1$ $-((1-b)(b(1-b)+\overline{sg}(1-b))+\overline{sg}(b)))+\overline{sg}(1$ $-((1-b)(b(1-b)+\overline{sg}(1-b))+\overline{sg}(b)))),$ $\min((1-c)c+\overline{sg}(c),(1-((1-b)(b(1-b)$ $+\overline{sg}(1-b))+\overline{sg}(b)))(((1-b)(b(1-b)$ $+\overline{sg}(1-b))+\overline{sg}(b))(1-((1-b)(b(1$ $-b)+\overline{sg}(1-b))+\overline{sg}(b)))+\overline{sg}(1-((1-b)(b(1-b)$ $+\overline{sg}(1-b))+\overline{sg}(b))))+\overline{sg}(((1-b)(b(1-b)$ $+\overline{sg}(1-b))+\overline{sg}(b))))\rangle$
$\wedge_{2,136}$	$\langle \max(c,((1-b)(b(1-b)+\overline{sg}(1-b))+\overline{sg}(b))(1$ $-((1-b)(b(1-b)+\overline{sg}(1-b))+\overline{sg}(b)))$ $+\overline{sg}(1-((1-b)(b(1-b)+\overline{sg}(1-b))+\overline{sg}(b))))$ $-\max(c,((1-b)(b(1-b)+\overline{sg}(1-b))$ $+\overline{sg}(b))(1-((1-b)(b(1-b)$ $+\overline{sg}(1-b))+\overline{sg}(b)))+\overline{sg}(1-((1-b)(b(1-b)$ $+\overline{sg}(1-b))+\overline{sg}(b))))^2+\overline{sg}(\max(c,$ $((1-b)(b(1-b)+\overline{sg}(1-b))+\overline{sg}(b))(1$ $-((1-b)(b(1-b)+\overline{sg}(1-b))+\overline{sg}(b)))$ $+\overline{sg}(1-((1-b)(b(1-b)+\overline{sg}(1-b))$ $+\overline{sg}(b))))),\max(c,((1-b)(b(1-b)$ $+\overline{sg}(1-b))+\overline{sg}(b))(1-((1-b)(b(1-b)$ $+\overline{sg}(1-b))+\overline{sg}(b)))+\overline{sg}(1-((1-b)(b(1-b)$ $+\overline{sg}(1-b))+\overline{sg}(b))))^2-\max(c,((1-b)(b(1$ $-b)+\overline{sg}(1-b))+\overline{sg}(b))(1-((1-b)(b(1-b)$ $+\overline{sg}(1-b))+\overline{sg}(b)))+\overline{sg}(1-((1-b)(b(1-b)$ $+\overline{sg}(1-b))+\overline{sg}(b))))^3+\overline{sg}(1-\max(c,$ $((1-b)(b(1-b)+\overline{sg}(1-b))+\overline{sg}(b))(1$ $-((1-b)(b(1-b)+\overline{sg}(1-b))+\overline{sg}(b)))$ $+\overline{sg}(1-((1-b)(b(1-b)+\overline{sg}(1-b))+\overline{sg}(b)))))\rangle$
$\vee_{2,137}$	$\langle 1-b+b(1-d),(d(1-d)+\overline{sg}((1-d)))b\rangle$
$\wedge_{2,137}$	$\langle ((1-d)d+\overline{sg}(d))(1-b),1-((1-d)d+\overline{sg}(d))(1-b)\rangle$
$\vee_{2,138}$	$\langle c+((1-b)(b(1-b)+\overline{sg}(1-b))+\overline{sg}(b))(1-((1-b)$ $.(b(1-b)+\overline{sg}(1-b))+\overline{sg}(b)))-c(((1-b)(b(1-b)$ $+\overline{sg}(1-b))+\overline{sg}(b))(1-((1-b)(b(1-b)+\overline{sg}(1-b))$ $+\overline{sg}(b)))+\overline{sg}(1-((1-b)(b(1-b)+\overline{sg}(1-b))+\overline{sg}(b)))),$ $((1-c)c+\overline{sg}(c))((1-((1-b)(b(1-b)+\overline{sg}(1-b))$ $+\overline{sg}(b)))(((1-b)(b(1-b)+\overline{sg}(1-b))+\overline{sg}(b))(1$

	$-((1-b)(b(1-b)+\overline{sg}(1-b))+\overline{sg}(b)))+\overline{sg}(1$ $-((1-b)(b(1-b)+\overline{sg}(1-b))+\overline{sg}(b))))$ $+\overline{sg}(((1-b)(b(1-b)+\overline{sg}(1-b))+\overline{sg}(b))))\rangle$
$\wedge_{2,138}$	$\langle((1-c)c+\overline{sg}(c))((1-((1-b)(b(1-b)+\overline{sg}(1-b))$ $+\overline{sg}(b)))(((1-b)(b(1-b)+\overline{sg}(1-b))+\overline{sg}(b))$ $.(1-((1-b)(b(1-b)+\overline{sg}(1-b))+\overline{sg}(b)))+\overline{sg}(1-$ $((1-b)(b(1-b)+\overline{sg}(1-b))+\overline{sg}(b))))+\overline{sg}(((1-b)$ $.(b(1-b)+\overline{sg}(1-b))+\overline{sg}(b))))-(((1-c)c+\overline{sg}(c))$ $.((1-((1-b)(b(1-b)+\overline{sg}(1-b))+\overline{sg}(b)))(((1-b)$ $.(b(1-b)+\overline{sg}(1-b))+\overline{sg}(b))(1-((1-b)(b(1-b)$ $+\overline{sg}(1-b))+\overline{sg}(b)))+\overline{sg}(1-((1-b)(b(1-b)$ $+\overline{sg}(1-b))+\overline{sg}(b))))+\overline{sg}(((1-b)(b(1-b)$ $+\overline{sg}(1-b))+\overline{sg}(b)))))^2,(1-(((1-c)c+\overline{sg}(c))$ $.((1-((1-b)(b(1-b)+\overline{sg}(1-b))+\overline{sg}(b)))(((1-b)$ $.(b(1-b)+\overline{sg}(1-b))+\overline{sg}(b))(1-((1-b)(b(1-b)$ $+\overline{sg}(1-b))+\overline{sg}(b)))+\overline{sg}(1-((1-b)(b(1-b)$ $+\overline{sg}(1-b))+\overline{sg}(b))))+\overline{sg}(((1-b)(b(1-b)$ $+\overline{sg}(1-b))+\overline{sg}(b))))))((((1-c)c+\overline{sg}(c))((1$ $-((1-b)(b(1-b)+\overline{sg}(1-b))+\overline{sg}(b)))(((1-b)$ $.(b(1-b)+\overline{sg}(1-b))+\overline{sg}(b))(1-((1-b)(b(1-b)$ $+\overline{sg}(1-b))+\overline{sg}(b)))+\overline{sg}(1-((1-b)(b(1-b)$ $+\overline{sg}(1-b))+\overline{sg}(b))))+\overline{sg}(((1-b)(b(1-b)$ $+\overline{sg}(1-b))+\overline{sg}(b)))))(1-(((1-c)c+\overline{sg}(c))$ $.((1-((1-b)(b(1-b)+\overline{sg}(1-b))+\overline{sg}(b)))$ $.(((1-b)(b(1-b)+\overline{sg}(1-b))+\overline{sg}(b))(1-((1-b)$ $.(b(1-b)+\overline{sg}(1-b))+\overline{sg}(b)))+\overline{sg}(1-((1-b)$ $.(b(1-b)+\overline{sg}(1-b))+\overline{sg}(b))))+\overline{sg}(((1-b)$ $.(b(1-b)+\overline{sg}(1-b))+\overline{sg}(b))))))+\overline{sg}(1-((1-c)c$ $+\overline{sg}(c))((1-((1-b)(b(1-b)+\overline{sg}(1-b))+\overline{sg}(b)))$ $.(((1-b)(b(1-b)+\overline{sg}(1-b))+\overline{sg}(b))(1-((1-b)$ $.(b(1-b)+\overline{sg}(1-b))+\overline{sg}(b)))+\overline{sg}(1-((1-b)$ $.(b(1-b)+\overline{sg}(1-b))+\overline{sg}(b))))+\overline{sg}(((1-b)(b(1-b)$ $+\overline{sg}(1-b))+\overline{sg}(b))))))+\overline{sg}(((1-c)c+\overline{sg}(c))$ $.((1-((1-b)(b(1-b)+\overline{sg}(1-b))+\overline{sg}(b)))(((1-b)$ $.(b(1-b)+\overline{sg}(1-b))+\overline{sg}(b))(1-((1-b)(b(1-b)$ $+\overline{sg}(1-b))+\overline{sg}(b)))+\overline{sg}(1-((1-b)$ $.(b(1-b)+\overline{sg}(1-b))+\overline{sg}(b))))+\overline{sg}(((1-b)(b(1-b)$

	$+\overline{sg}(1-b)) + \overline{sg}(b)))))\rangle$
$\vee_{2,139}$	$\langle \frac{3+2a+c}{8}, \frac{2+2b+d}{8} \rangle$
$\wedge_{2,139}$	$\langle \frac{3+a+2c}{16}, \frac{10+b+2d}{16} \rangle$
$\vee_{2,140}$	$\langle \frac{3a+2c+10}{27}, \frac{3b+2d+12}{27} \rangle$
$\wedge_{2,140}$	$\langle \frac{a+14+6c}{81}, \frac{b+6d+60}{81} \rangle$
$\vee_{2,141}$	$\langle \frac{6a+4c+5+\max(6a+3,4c+2)}{27}, \frac{6b+4d+3+\min(6b,4d+3)}{27} \rangle$
$\wedge_{2,141}$	$\langle \frac{8a+12c+10+2\min(4a+2,6c+3)}{81}, \frac{16b+24d+14+4\max(4b+3,6d)}{81} \rangle$
$\vee_{2,142}$	$\langle 1-\frac{10-3a-c+\max(3-3a,7-c}{27}, \frac{10-3a-c+\max(3-3a,7-c}{27} \rangle$
$\wedge_{2,142}$	$\langle \frac{a+3c+8+\max(2+a,6+3c)}{81}, 1-\frac{a+3c+8+\max(2+a,6+3c)}{81} \rangle$
$\vee_{2,143}$	$\langle 1-\frac{10-3a-c+\max(3-3a,7-c}{27}, \frac{10-3a-c+\max(3-3a,7-c}{27} \rangle$
$\wedge_{2,143}$	$\langle \frac{5+a-3c+\max(2+a,3-3c)}{81}, 1-\frac{5+a-3c+\max(2+a,3-3c)}{81} \rangle$
$\vee_{2,144}$	$\langle \frac{15-3b-2d}{27}, 1-\frac{15-3b-2d}{27} \rangle$
$\wedge_{2,144}$	$\langle \frac{21-b-6d}{81}, 1-\frac{21-b-6d}{81} \rangle$
$\vee_{2,145}$	$\langle \frac{15-3b-2d}{27}, 1-\frac{15-3b-2d}{27} \rangle$
$\wedge_{2,145}$	$\langle \frac{21-b-6d}{81}, 1-\frac{21-b-6d}{81} \rangle$
$\vee_{2,146}$	$\langle \frac{6a+4c+14-\min(6-6a,7-4c}{27}, 1-\frac{6a+4c+14-\min(6-6a,7-4c}{27} \rangle$
$\wedge_{2,146}$	$\langle \frac{8a+12c+10+2\min(4a+2,6c+3)}{81}, 1-\frac{8a+12c+10+2\min(4a+2,6c+3)}{81} \rangle$
$\vee_{2,147}$	$\langle \frac{6a+4c+5+\max(6a+3,4c+2)}{27}, 1-\frac{6a+4c+5+\max(6a+3,4c+2)}{27} \rangle$
$\wedge_{2,147}$	$\langle \frac{4a+6c+28-2\max(7-4a,6-6c}{81}, 1-\frac{4a+6c+28-2\max(7-4a,6-6c}{81} \rangle$
$\vee_{2,148}$	$\langle \frac{24-12b-8d-2\max(9-6b,6-4d)}{27}, 1-\frac{24-12b-8d-2\max(9-6b,6-4d)}{27} \rangle$
$\wedge_{2,148}$	$\langle \frac{48-8b-4d-\max(3+4d,6d)}{81}, 1-\frac{48-8b-4d-\max(3+4d,6d)}{81} \rangle$
$\vee_{2,149}$	$\langle \frac{15-6b-4d+\max(9-6b,6-4d)}{27}, 1-\frac{15-6b-4d+\max(9-6b,6-4d)}{27} \rangle$
$\wedge_{2,149}$	$\langle \frac{48-8b-12d-2\max(3+4b,6d)}{81}, 1-\frac{48-8b-12d-2\max(3+4b,6d)}{81} \rangle$
$\vee_{2,150}$	$\langle \frac{2\lambda.a+c+4\lambda^3-\lambda}{8\lambda^3}, \frac{2\lambda.b+d+4\lambda^3-\lambda-1}{8\lambda^3} \rangle$
$\wedge_{2,150}$	$\langle \frac{a+2\lambda.c+4\lambda^2-\lambda+2\lambda(2\lambda-1)(\lambda-1)}{16\lambda^4}, \frac{b+2\lambda.d+4\lambda^3+4\lambda^2-\lambda-1}{16\lambda^4} \rangle$
$\vee_{2,151}$	$\langle \frac{(a+\gamma)(2\gamma+1)+c+2\gamma^2+2\gamma+\gamma(2\gamma+1)^2}{(2\gamma+1)^3}, \frac{(b+\gamma)(2\gamma+1)+d+2\gamma^2+2\gamma+(\gamma-1)(2\gamma+1)^2}{(2\gamma+1)^3} \rangle$
$\wedge_{2,151}$	$\langle \frac{a+(2\gamma+1)c+4\gamma^2+3\gamma+(2\gamma^2+2\gamma-1)(2\gamma+1)^2}{(2\gamma+1)^4}, \frac{b+(2\gamma+1)d+(2\gamma^2+2\gamma)(4\gamma^2+4\gamma+2)}{(2\gamma+1)^4} \rangle$
$\vee_{2,152}$	$\langle \frac{(a+\beta)(\alpha+\beta)+c+\alpha^2+\alpha\beta+(\alpha+\beta)^2(\alpha-1)}{(\alpha+\beta)^3},$

	$\frac{(b+\alpha-1)(\alpha+\beta)+d+\alpha-1+\beta(\alpha+\beta)+(\alpha+\beta)^2(\beta-1)}{(\alpha+\beta)^3}\rangle$
$\wedge_{2,152}$	$\langle\frac{(\alpha-1)(\alpha+\beta)^3+a+(\alpha-1)(\alpha+\beta)+\beta+(\beta-1)(\alpha+\beta)^2+(c+\beta)(\alpha+\beta)}{(\alpha+\beta)^4},$ $\frac{\beta(\alpha+\beta)^3+b+\alpha-1+\beta(\alpha+\beta)+(\alpha-1)(\alpha+\beta)^2+(d+\alpha-1)(\alpha+\beta)}{(\alpha+\beta)^4}\rangle$
$\vee_{2,153}$	$\langle\min(1,\max(c,\max(0,a-\eta)+\varepsilon)),$ $\max(0,\min(d,\min(1,b+\varepsilon)-\eta))\rangle$
$\wedge_{2,153}$	$\langle\min(1,\max(0,\min(\max(0,c-\eta),$ $\min(1,\max(0,a-\eta)+\varepsilon)-\eta))+\varepsilon),$ $\max(0,\min(1,\max(\min(1,d+\varepsilon),$ $\max(0,\min(1,b+\varepsilon)-\eta)+\varepsilon))-\eta)\rangle$
$\vee_{2,154}$	$\langle\frac{4\lambda^3+(2a-1)\lambda+c}{8\lambda^3},\frac{4\lambda^3+(1-2c)\lambda-a}{8\lambda^3}\rangle$
$\wedge_{2,154}$	$\langle\frac{1}{2}-\frac{4\lambda^3+(1-2c)\lambda-a}{16\lambda^4},\frac{1}{2}+\frac{4\lambda^3+(1-2c)\lambda-a}{16\lambda^4}\rangle$
$\vee_{2,155}$	$\langle 1-\frac{4\lambda^3-(1-2a)\lambda-c}{8\lambda^3},\frac{4\lambda^3-(1-2a)\lambda-c}{8\lambda^3}\rangle$
$\wedge_{2,155}$	$\langle\frac{1}{2}-\frac{4\lambda^3+(1-2c)\lambda-a}{16\lambda^4},\frac{1}{2}+\frac{4\lambda^3+(1-2c)\lambda-a}{16\lambda^4}\rangle$
$\vee_{2,156}$	$\langle\frac{4\lambda^3+(5-2b)\lambda+1-d}{8\lambda^3},1-\frac{4\lambda^3+(5-2b)\lambda+1-d}{8\lambda^3}\rangle$
$\wedge_{2,156}$	$\langle\frac{8\lambda^4-4\lambda^3+(1-2d)\lambda+1-b}{16\lambda^4},1-\frac{8\lambda^4-4\lambda^3+(1-2d)\lambda+1-b}{16\lambda^4}\rangle$
$\vee_{2,157}$	$\langle\frac{4\lambda^3+(1-2b)\lambda+1-d}{8\lambda^3},1-\frac{4\lambda^3+(1-2b)\lambda+1-d}{8\lambda^3}\rangle$
$\wedge_{2,157}$	$\langle\frac{4\lambda^3-2\lambda^2+(2d-1)\lambda+b-1}{8\lambda^3},1-\frac{4\lambda^3-2\lambda^2+(2d-1)\lambda+b-1}{8\lambda^3}\rangle$
$\vee_{2,158}$	$\langle 1-\frac{\gamma(2\gamma+1)^2+(1-a+\gamma)(2\gamma+1)-2\gamma^2-2\gamma-c}{(2\gamma+1)^3},$ $\frac{\gamma(2\gamma+1)^2+(1-a+\gamma)(2\gamma+1)-2\gamma^2-2\gamma-c}{(2\gamma+1)^3}\rangle$
$\wedge_{2,158}$	$\langle 1-\frac{\gamma(2\gamma+1)^3+(1+\gamma)(2\gamma+1)^2-c(2\gamma+1)+1-\alpha+\gamma}{(2\gamma+1)^4},$ $\frac{\gamma(2\gamma+1)^3+(1+\gamma)(2\gamma+1)^2-c(2\gamma+1)+1-\alpha+\gamma}{(2\gamma+1)^4}\rangle$
$\vee_{2,159}$	$\langle 1-\frac{(\gamma-1)(2\gamma+1)^2+(1-a+\gamma)(2\gamma+1)+2\gamma^2+2\gamma+1-c}{(2\gamma+1)^3},$ $\frac{(\gamma-1)(2\gamma+1)^2+(1-a+\gamma)(2\gamma+1)+2\gamma^2+2\gamma+1-c}{(2\gamma+1)^3}\rangle$
$\wedge_{2,159}$	$\langle 1-\frac{\gamma(2\gamma+1)^3+(1+\gamma)(2\gamma+1)^2-c(2\gamma+1)+1-\alpha+\gamma}{(2\gamma+1)^4},$ $\frac{\gamma(2\gamma+1)^3+(1+\gamma)(2\gamma+1)^2-c(2\gamma+1)+1-\alpha+\gamma}{(2\gamma+1)^4}\rangle$
$\vee_{2,160}$	$\langle\frac{(\gamma+1)(2\gamma+1)^2+(1-b+\gamma)(2\gamma+1)-2\gamma^2-2\gamma-d}{(2\gamma+1)^3},$ $1-\frac{(\gamma+1)(2\gamma+1)^2+(1-b+\gamma)(2\gamma+1)-2\gamma^2-2\gamma-d}{(2\gamma+1)^3}\rangle$
$\wedge_{2,160}$	$\langle\frac{\gamma(2\gamma+1)^3+\gamma(2\gamma+1)^2-d(2\gamma+1)+1-\beta+\gamma}{(2\gamma+1)^4},$ $1-\frac{\gamma(2\gamma+1)^3+\gamma(2\gamma+1)^2-d(2\gamma+1)+1-\beta+\gamma}{(2\gamma+1)^4}\rangle$
$\vee_{2,161}$	$\langle\frac{\gamma(2\gamma+1)^2+(1-b+\gamma)(2\gamma+1)+2\gamma^2+2\gamma+1-d}{(2\gamma+1)^3},$

	$1-\frac{\gamma(2\gamma+1)^2+(1-b+\gamma)(2\gamma+1)+2\gamma^2+2\gamma+1-d}{(2\gamma+1)^3}\rangle$
$\wedge_{2,161}$	$\langle\frac{\gamma(2\gamma+1)^3+\gamma(2\gamma+1)^2-d(2\gamma+1)+1-\beta+\gamma}{(2\gamma+1)^4},$ $1-\frac{\gamma(2\gamma+1)^3+\gamma(2\gamma+1)^2-d(2\gamma+1)+1-\beta+\gamma}{(2\gamma+1)^4}\rangle$
$\vee_{2,162}$	$\langle 1-\frac{(b-1+\alpha)(\alpha+\beta)-d-\alpha^2+\beta(\alpha+\beta)^2-\alpha\beta}{(\alpha+\beta)^3},$ $\frac{(b-1+\alpha)(\alpha+\beta)-d-\alpha^2+\beta(\alpha+\beta)^2-\alpha\beta}{(\alpha+\beta)^3}\rangle$
$\wedge_{2,162}$	$\langle\frac{(\alpha-1)(\alpha+\beta)^2+\beta(\alpha+\beta)+1-d}{(\alpha+\beta)^3},$ $\frac{\beta(\alpha+\beta)^2+\beta(\alpha+\beta)+1-d}{(\alpha+\beta)^3}\rangle$
$\vee_{2,163}$	$\langle\frac{\alpha(\alpha+\beta)^2-(b-1)(\alpha+\beta)-d-\alpha+1}{(\alpha+\beta)^3},$ $1-\frac{\alpha(\alpha+\beta)^2-(b-1)(\alpha+\beta)-d-\alpha+1}{(\alpha+\beta)^3}\rangle$
$\wedge_{2,163}$	$\langle\frac{(\alpha-1)(\alpha+\beta)^2+\beta(\alpha+\beta)+c}{(\alpha+\beta)^3},$ $\frac{\beta(\alpha+\beta)^2+\beta(\alpha+\beta)+c}{(\alpha+\beta)^3}\rangle$
$\vee_{2,164}$	$\langle\frac{\alpha(\alpha+\beta)^2+(1-b)(\alpha+\beta)-\alpha-d}{(\alpha+\beta)^3},$ $1-\frac{\alpha(\alpha+\beta)^2+(1-b)(\alpha+\beta)-\alpha-d}{(\alpha+\beta)^3}\rangle$
$\wedge_{2,164}$	$\langle\frac{(\alpha-1)(\alpha+\beta)^3+\beta(\alpha+\beta)^2-d(\alpha+\beta)+1-b+\beta}{(\alpha+\beta)^4},$ $1-\frac{(\alpha-1)(\alpha+\beta)^3+\beta(\alpha+\beta)^2-d(\alpha+\beta)+1-b+\beta}{(\alpha+\beta)^4}\rangle$
$\vee_{2,165}$	$\langle\frac{(\alpha-1)(\alpha+\beta)^2)+(1-b+2\beta)(\alpha+\beta)-\alpha+1-d}{(\alpha+\beta)^3},$ $1-\frac{(\alpha-1)(\alpha+\beta)^2)+(1-b+2\beta)(\alpha+\beta)-\alpha+1-d}{(\alpha+\beta)^3}\rangle$
$\wedge_{2,165}$	$\langle\frac{(\alpha-1)(\alpha+\beta)^3+\beta(\alpha+\beta)^2-d(\alpha+\beta)+1-b+\beta}{(\alpha+\beta)^4},$ $1-\frac{(\alpha-1)(\alpha+\beta)^3+\beta(\alpha+\beta)^2-d(\alpha+\beta)+1-b+\beta}{(\alpha+\beta)^4}\rangle$
$\vee_{2,166}$	$\langle\max(a,\min(b,c)),\min(b,\max(a,d))\rangle$
$\wedge_{2,166}$	$\langle\min(a,\max(b,c)),\max(b,\min(a,d))\rangle$
$\vee_{2,167}$	$\langle\max(a,\min(1-a,c)),$ $\min(1-a,1-\min(1-a,c))\rangle$
$\wedge_{2,167}$	$\langle 1-\max(1-a,\min(a,1-c)),$ $\max(1-a,\min(a,1-c))\rangle$
$\vee_{2,168}$	$\langle\max(a,\min(1-a,c)),$ $1-\max(a,\min(1-a,c))\rangle$
$\wedge_{2,168}$	$\langle 1-\max(1-a,\min(a,1-c)),$ $\max(1-a,\min(a,1-c))\rangle$
$\vee_{2,169}$	$\langle\max(1-b,\min(b,(1-d))),$

	$1-\max(1-b,\min(b,(1-d)))\rangle$
$\wedge_{2,169}$	$\langle 1-\max(b,\min(1-b,d)),$ $\max(b,\min(1-b,d))\rangle$
$\vee_{2,170}$	$\langle\max(1-b,\min(b,d)),1-\max(1-b,\min(b,d))\rangle$
$\wedge_{2,170}$	$\langle 1-\max(b,\min(1-b,d)),\max(b,\min(1-b,d))\rangle$
$\vee_{2,171}$	$\langle\overline{sg}(\max(\overline{sg}(1-b),\mathrm{sg}(d))-\max(\mathrm{sg}(1-b),\overline{sg}(d))),$ $\mathrm{sg}(\max(\overline{sg}(1-b),\mathrm{sg}(d))-\max(\mathrm{sg}(1-b),\overline{sg}(d)))\rangle$
$\wedge_{2,171}$	$\langle\mathrm{sg}(\max(\mathrm{sg}(1-b),\mathrm{sg}(1-d))$ $-\max(\overline{sg}(1-b),\overline{sg}(1-d))),\overline{sg}(\max(\mathrm{sg}(1-b),$ $\mathrm{sg}(1-d))-\max(\overline{sg}(1-b),\overline{sg}(1-d)))\rangle$
$\vee_{2,172}$	$\langle\overline{sg}(\overline{sg}(a)-\mathrm{sg}(c)),\mathrm{sg}(\overline{sg}(a)-\mathrm{sg}(c))\rangle$
$\wedge_{2,172}$	$\langle\mathrm{sg}(\mathrm{sg}(a)-\overline{sg}(c)),\overline{sg}(\mathrm{sg}(a)-\overline{sg}(c))\rangle$
$\vee_{2,173}$	$\langle\overline{sg}(\overline{sg}(a)+\overline{sg}(c)-1),\mathrm{sg}(\overline{sg}(a)+\overline{sg}(c)-1)\rangle$
$\wedge_{2,173}$	$\langle\mathrm{sg}(\mathrm{sg}(a)+\mathrm{sg}(d)-1),\overline{sg}(\mathrm{sg}(a)+\mathrm{sg}(d)-1)\rangle$
$\vee_{2,174}$	$\langle\overline{sg}(\mathrm{sg}(1-b)-\overline{sg}(d)),\mathrm{sg}(\mathrm{sg}(1-b)-\overline{sg}(d))\rangle$
$\wedge_{2,174}$	$\langle\mathrm{sg}(\overline{sg}(1-b)-os(1-d)),\overline{sg}(\overline{sg}(1-b)-os(1-d))\rangle$
$\vee_{2,175}$	$\langle\overline{sg}(\mathrm{sg}(d)-\mathrm{sg}(1-b)),\mathrm{sg}(\mathrm{sg}(d)-\mathrm{sg}(1-b))\rangle$
$\wedge_{2,175}$	$\langle\mathrm{sg}(\mathrm{sg}(1-d)-\overline{sg}(1-b)),\overline{sg}(\mathrm{sg}(1-d)-\overline{sg}(1-b))\rangle$
$\vee_{2,176}$	$\langle\overline{sg}(\overline{sg}(a)+\mathrm{sg}(a)b-c)+\mathrm{sg}(\overline{sg}(a)$ $+\mathrm{sg}(a)b-c)\max(a,c),\mathrm{sg}(\overline{sg}(a)+\mathrm{sg}(a)b$ $-c)\min(\overline{sg}(a)+\mathrm{sg}(a)b,d)\rangle$
$\wedge_{2,176}$	$\langle\overline{sg}(\overline{sg}(\overline{sg}(\overline{sg}(a)+b\mathrm{sg}(a))+b\mathrm{sg}(\overline{sg}(a)$ $+b\mathrm{sg}(a))-\overline{sg}(c)-d\mathrm{sg}(c))+\mathrm{sg}(\overline{sg}(\overline{sg}(a)+b\mathrm{sg}(a))$ $+b\mathrm{sg}(\overline{sg}(a)+b\mathrm{sg}(a))-\overline{sg}(c)-d\mathrm{sg}(c))\max(\overline{sg}(a)$ $+b\mathrm{sg}(a),\overline{sg}(c)+d\mathrm{sg}(c)))+\mathrm{sg}(\overline{sg}(\overline{sg}(\overline{sg}(a)$ $+b\mathrm{sg}(a))+b\mathrm{sg}(\overline{sg}(a)+b\mathrm{sg}(a))-\overline{sg}(c)-d\mathrm{sg}(c))$ $+\mathrm{sg}(\overline{sg}(\overline{sg}(a)+b\mathrm{sg}(a))+b\mathrm{sg}(\overline{sg}(a)+b\mathrm{sg}(a))$ $-\overline{sg}(c)-d\mathrm{sg}(c))\max(\overline{sg}(a)+b\mathrm{sg}(a),\overline{sg}(c)$ $+d\mathrm{sg}(c)))(\mathrm{sg}(\overline{sg}(\overline{sg}(a)+b\mathrm{sg}(a))+b\mathrm{sg}(\overline{sg}(a)$ $+b\mathrm{sg}(a))-\overline{sg}(c)-d\mathrm{sg}(c))\min(\overline{sg}(\overline{sg}(a)$ $+b\mathrm{sg}(a))+b\mathrm{sg}(\overline{sg}(a)+b\mathrm{sg}(a)),c)),$ $\overline{sg}(\overline{sg}(\overline{sg}(a)+b\mathrm{sg}(a))+b\mathrm{sg}(\overline{sg}(a)$ $+b\mathrm{sg}(a))-\overline{sg}(c)-d\mathrm{sg}(c))+\mathrm{sg}(\overline{sg}(\overline{sg}(a)$ $+b\mathrm{sg}(a))+b\mathrm{sg}(\overline{sg}(a)+b\mathrm{sg}(a))-\overline{sg}(c)$ $-d\mathrm{sg}(c))\max(\overline{sg}(a)+b\mathrm{sg}(a),\overline{sg}(c)+d\mathrm{sg}(c))\rangle$
$\vee_{2,177}$	$\langle\overline{sg}(\overline{sg}(a)+\mathrm{sg}(a)(1-a)-c)+\mathrm{sg}(\overline{sg}(a)$ $+\mathrm{sg}(a)(1-a)-c)\max(\mathrm{sg}(a)(2-a),c),\mathrm{sg}(\overline{sg}(a)$

	$+\mathrm{sg}(a)(1-a)-c)\min(\overline{sg}(a)+\mathrm{sg}(a)(1-a),1-c)\rangle$
$\wedge_{2,177}$	$\langle\overline{sg}(\overline{sg}(-\mathrm{sg}(1-a\mathrm{sg}(a))+a\mathrm{sg}(a-a^2\mathrm{sg}(a))+c\mathrm{sg}(c))$ $+\mathrm{sg}(-\mathrm{sg}(1-a\mathrm{sg}(a))+a\mathrm{sg}(a-a^2\mathrm{sg}(a))$ $+c\mathrm{sg}(c))\max(\mathrm{sg}(1-a\mathrm{sg}(a))-a\mathrm{sg}(a-a^2\mathrm{sg}(a)),$ $1-c\mathrm{sg}(c)))+\mathrm{sg}(\overline{sg}(-\mathrm{sg}(1-a\mathrm{sg}(a))+a\mathrm{sg}(a$ $-a^2\mathrm{sg}(a))+c\mathrm{sg}(c))+\mathrm{sg}(-\mathrm{sg}(1-a\mathrm{sg}(a))$ $+a\mathrm{sg}(a-a^2\mathrm{sg}(a))+c\mathrm{sg}(c))\max(\mathrm{sg}(1-a\mathrm{sg}(a))$ $-a\mathrm{sg}(a-a^2\mathrm{sg}(a)),1-c\mathrm{sg}(c)))(\mathrm{sg}($ $-\mathrm{sg}(1-a\mathrm{sg}(a))+a\mathrm{sg}(a-a^2\mathrm{sg}(a))$ $+c\mathrm{sg}(c))-\mathrm{sg}(-\mathrm{sg}(1-a\mathrm{sg}(a))+a\mathrm{sg}(a-a^2\mathrm{sg}(a))$ $+c\mathrm{sg}(c))\max(\mathrm{sg}(1-a\mathrm{sg}(a))-a\mathrm{sg}(a-a^2\mathrm{sg}(a)),$ $1-c\mathrm{sg}(c))),\overline{sg}(-\mathrm{sg}(1-a\mathrm{sg}(a))+a\mathrm{sg}(a$ $-a^2\mathrm{sg}(a))+c\mathrm{sg}(c))+\mathrm{sg}(-\mathrm{sg}(1-a\mathrm{sg}(a))+a\mathrm{sg}(a$ $-a^2\mathrm{sg}(a))+c\mathrm{sg}(c))\max(\mathrm{sg}(1-a\mathrm{sg}(a))$ $-a\mathrm{sg}(a-a^2\mathrm{sg}(a)),1-c\mathrm{sg}(c))\rangle$
$\vee_{2,178}$	$\langle\overline{sg}(-a\mathrm{sg}(a)+d)+\mathrm{sg}(a-1+d)(1-\min(\overline{sg}(a)$ $+\mathrm{sg}(a)(1-a),d)),\mathrm{sg}(-a\mathrm{sg}(a)+d)\min(\overline{sg}(a)$ $+\mathrm{sg}(a)(1-a),d)\rangle$
$\wedge_{2,178}$	$\langle\overline{sg}(\overline{sg}(\overline{sg}(1-a\mathrm{sg}(a))+a\mathrm{sg}(a-a^2\mathrm{sg}(a))-1+c)$ $+\mathrm{sg}(\overline{sg}(1-a\mathrm{sg}(a))+a\mathrm{sg}(a-a^2\mathrm{sg}(a))-1+c)(1$ $-\min(\overline{sg}(1-a\mathrm{sg}(a))+a\mathrm{sg}(a-a^2\mathrm{sg}(a)),c)))$ $+\mathrm{sg}(\overline{sg}(\overline{sg}(1-a\mathrm{sg}(a))+a\mathrm{sg}(a-a^2\mathrm{sg}(a))-1+c)$ $+\mathrm{sg}(\overline{sg}(1-a\mathrm{sg}(a))+a\mathrm{sg}(a-a^2\mathrm{sg}(a))-1+c)(1$ $-\min(\overline{sg}(1-a\mathrm{sg}(a))+a\mathrm{sg}(a-a^2\mathrm{sg}(a)),$ $c)))(\mathrm{sg}(\overline{sg}(1-a\mathrm{sg}(a))+a\mathrm{sg}(a-a^2\mathrm{sg}(a))-1+c)$ $-\mathrm{sg}(\overline{sg}(1-a\mathrm{sg}(a))+a\mathrm{sg}(a-a^2\mathrm{sg}(a))-1+c)(1$ $-\min(\overline{sg}(1-a\mathrm{sg}(a))+a\mathrm{sg}(a-a^2\mathrm{sg}(a)),c))),$ $\overline{sg}(\overline{sg}(1-a\mathrm{sg}(a))+a\mathrm{sg}(a-a^2\mathrm{sg}(a))-1+c)$ $+\mathrm{sg}(\overline{sg}(1-a\mathrm{sg}(a))+a\mathrm{sg}(a-a^2\mathrm{sg}(a))-1+c)(1$ $-\min(\overline{sg}(1-a\mathrm{sg}(a))+a\mathrm{sg}(a-a^2\mathrm{sg}(a)),c))\rangle$
$\vee_{2,179}$	$\langle\overline{sg}(a-\overline{sg}(c)-(1-c)\mathrm{sg}(c))+\mathrm{sg}(a-\overline{sg}(c)$ $+(1-c)\mathrm{sg}(c))\max(1-a,\overline{sg}(c)+(1-c)\mathrm{sg}(c)),\mathrm{sg}(a$ $-\overline{sg}(c)-(1-c)\mathrm{sg}(c))(1-\max(1-a,\overline{sg}(c)$ $+(1-c)\mathrm{sg}(c)))\rangle$
$\wedge_{2,179}$	$\langle\overline{sg}(1-\mathrm{sg}(1-(1-b)\mathrm{sg}(1-b)-\overline{sg}(1-d)-d\mathrm{sg}(1-d))$ $.(1-\max((1-b)\mathrm{sg}(1-b),\overline{sg}(1-d)+d\mathrm{sg}(1-d))))$ $+\mathrm{sg}(1-\mathrm{sg}(1-(1-b)\mathrm{sg}(1-b)-\overline{sg}(1-d)$

	$-d\mathrm{sg}(1-d))(1-\max((1-b)\mathrm{sg}(1-b), \overline{sg}(1-d)$ $+d\mathrm{sg}(1-d))))\mathrm{sg}(1-(1-b)\mathrm{sg}(1-b)-\overline{sg}(1-d)$ $-d\mathrm{sg}(1-d))(1-\max((1-b)\mathrm{sg}(1-b), \overline{sg}(1-d)$ $+d\mathrm{sg}(1-d))), 1-(\overline{sg}(1-(1-b)\mathrm{sg}(1-b)-\overline{sg}(1-d)$ $-d\mathrm{sg}(1-d))+\mathrm{sg}(1-(1-b)\mathrm{sg}(1-b)-\overline{sg}(1-d)$ $-d\mathrm{sg}(1-d))\max((1-b)\mathrm{sg}(1-b), \overline{sg}(1-d)$ $+d\mathrm{sg}(1-d)))\rangle$
$\vee_{2,180}$	$\langle\overline{sg}(d-1+a)+\mathrm{sg}(d-1+a)\max(1-a, 1-d),$ $\mathrm{sg}(d-1+a)\min(a, d)\rangle$
$\vee_{2,181}$	$\langle 1-\overline{sg}(a).\overline{sg}(c), \overline{sg}(c).\overline{sg}(a)\rangle$
$\wedge_{2,181}$	$\langle\overline{sg}(1-\mathrm{sg}(a)\mathrm{sg}(c)), \mathrm{sg}(1-\mathrm{sg}(a)\mathrm{sg}(c))\rangle$
$\vee_{2,182}$	$\langle 1-\overline{sg}(a).\overline{sg}(c), \overline{sg}(c).\overline{sg}(a)\rangle$
$\wedge_{2,182}$	$\langle\overline{sg}(1-\mathrm{sg}(a)\mathrm{sg}(c)), \mathrm{sg}(1-\mathrm{sg}(a)\mathrm{sg}(c))\rangle$
$\vee_{2,183}$	$\langle 1-\overline{sg}(a).\overline{sg}(c), \overline{sg}(c).\overline{sg}(a)\rangle$
$\wedge_{2,183}$	$\langle\overline{sg}(1-\mathrm{sg}(a).\mathrm{sg}(c)), \mathrm{sg}(1-\mathrm{sg}(a).\mathrm{sg}(c))\rangle$
$\vee_{2,184}$	$\langle 1-\overline{sg}(1-b).\overline{sg}(1-d), \overline{sg}(1-b).\overline{sg}(1-d)\rangle$
$\wedge_{2,184}$	$\langle\overline{sg}(\mathrm{sg}(1-d).\mathrm{sg}(1-b)), \mathrm{sg}(\mathrm{sg}(1-d).\mathrm{sg}(1-b))\rangle$
$\vee_{2,185}$	$\langle 1-\overline{sg}(1-b)\overline{sg}(1-d), (1-\overline{sg}(d)).\overline{sg}(1-b)\rangle$
$\wedge_{2,185}$	$\langle\overline{sg}(1-\mathrm{sg}(1-d).\mathrm{sg}(1-b)), \mathrm{sg}(1-\mathrm{sg}(1-d).\mathrm{sg}(1-b))\rangle$

References

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