

a) $f(a,b,c) = a \cdot b \cdot c + abc + abc$

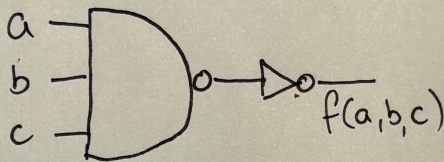
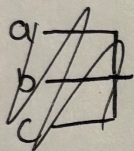
a	b	c	$a \cdot b \cdot c$	$abc + abc + abc$
1	1	1	1	1
1	1	0	0	0
1	0	1	0	0
1	0	0	0	0
0	1	1	0	0
0	1	0	0	0
0	0	1	0	0
0	0	0	0	0

NAND:

A	B	F
0	0	1
0	1	1
1	0	1
1	1	0

a	b	c	$a \text{ NAND } b \text{ NAND } c$
1	1	1	0
1	1	0	1
1	0	1	1
1	0	0	1
0	1	1	1
0	1	0	1
0	0	1	1
0	0	0	1

$f(a,b,c) = \sim(a \text{ NAND } b \text{ NAND } c)$



b) $f(a,b,c) = abc + abc + abc$

NOR:

a	b	f
0	0	1
0	1	0
1	0	0
1	1	0

a	b	c	$a \text{ NOR } b \text{ NOR } c$	$b \text{ NOR } c$	$a \text{ NOR } c$
1	1	1	0	0	0
1	1	0	0	0	0
1	0	1	0	1	0
1	0	0	0	0	0
0	1	1	0	0	0
0	1	0	0	0	0
0	0	1	0	0	0
0	0	0	1	1	1

$f(a,b,c) = a \text{ NOR } b \text{ NOR } c$

