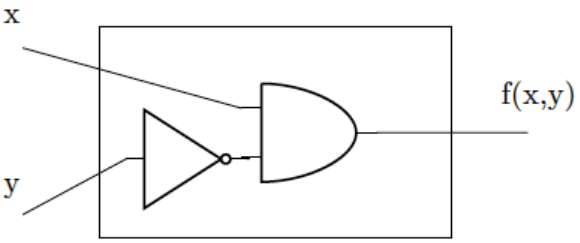
Wojciech Kubiak

Zadanie 1.

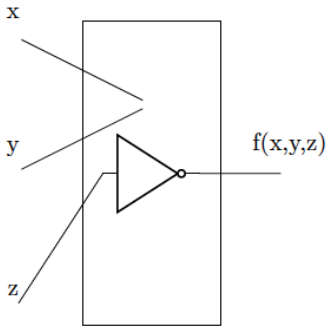
a. $f(x, y) = (\neg x \cup \neg y) \cap \neg (y \cup \neg x) = \neg y \cap x$

x	y	x
0	0	0
0	1	0
1	0	1
1	1	0



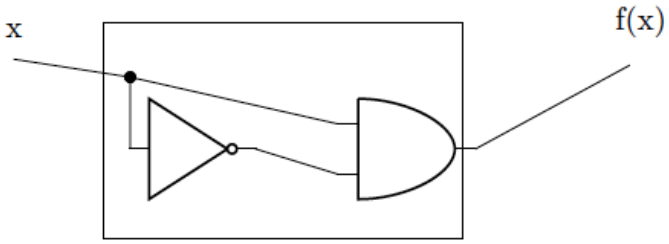
b. $f (x, y, z) = \neg z \cup (x \cap y \cap \neg z) = \neg z$

x	y	z	¬ z
0	0	0	1
0	0	1	0
0	1	0	1
0	1	1	0
1	0	0	1
1	0	1	0
1	1	0	1
1	1	1	0



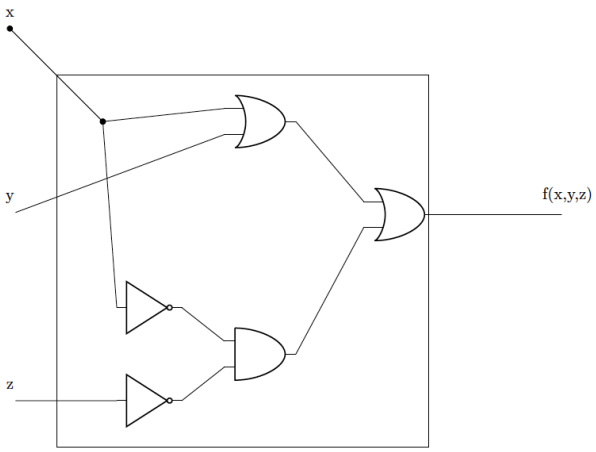
c. $f (x) = \neg x \cap x$

x	¬ x ∩ x
0	0
1	0

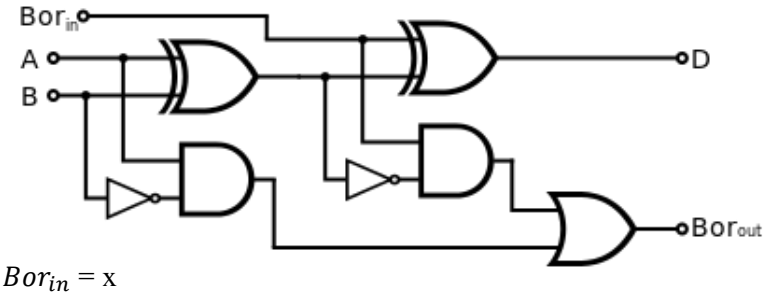


d. $f (x, y, z) = x \cup y \cup (\neg x \cap \neg z)$

x	y	z	x ∪ y ∪ (¬ x ∩ ¬ z)
0	0	0	1
0	0	1	0
0	1	0	1
0	1	1	1
1	0	0	1
1	0	1	1
1	1	0	1
1	1	1	1



Zadanie 2.



Bor_{in} = x
A = y
Bor = z
D = f (x, y, z)
Bor_{out} = g (x, y, x)
xor (a, b) = (a ∪ b) ∩ (¬ a ∪ ¬ b)
f (x, y, z) = (((x ∪ y) ∩ (¬ x ∪ ¬ y)) ∪ z) ∩ (¬ ((x ∪ y) ∩ (¬ x ∪ ¬ y)) ∪ ¬ z) =
= (((x ∪ y) ∩ (¬ x ∪ ¬ y)) ∪ z) ∩ (((¬ x ∪ ¬ y) ∪ (x ∩ y) ∪ ¬ z =
= (x ∩ y ∩ z) ∪ (x ∩ ¬ y ∩ ¬ z) ∪ (¬ x ∩ y ∩ ¬ z) ∪ (¬ x ∩ ¬ y ∩ z)

x	y	z	(¬ x ∩ y) ∪ (¬ x ∩ z) ∪ (y ∩ z)
0	0	0	0
0	0	1	1
0	1	0	1
0	1	1	1
1	0	0	0
1	0	1	0
1	1	0	0
1	1	1	1

g (x, y, z) = ((¬ x ∩ y) ∪ (¬ ((x ∪ y) ∩ (¬ x ∩ ¬ y)) ∩ z))
∩ (¬ (¬ x ∩ y) ∪ ¬ (¬ ((x ∩ y) ∩ (¬ x ∪ ¬ y)) ∩ z)) = (¬ x ∩ y) ∪ (¬ x ∩ z) ∪ ((y ∩ z)

x	y	z	(¬ x ∩ y) ∪ (¬ x ∩ z) ∪ (y ∩ z)
0	0	0	0
0	0	1	1
0	1	0	1
0	1	1	1
1	0	0	0
1	0	1	0
1	1	0	0
1	1	1	1

Zadanie 3.

f (a, b, c) = ¬ (a ∩ b ∩ c) ∩ (¬ a ∪ ¬ b ∪ c) ∩ (a ∩ ¬ c) ∩ (a ∩ ¬ b ∩ c) =
= (¬ a ∩ ¬ b ∩ ¬ c) ∩ (¬ a ∪ ¬ b ∪ c) ∩ (a ∩ ¬ c) ∩ (a ∩ ¬ b ∩ c) =
= (a ∩ ¬ c) ∩ (¬ b) ∩ (¬ b) ∩ (a ∩ ¬ b) =
= a ∩ ¬ c ∩ ¬ b

a	b	c	a ∩ ¬ c ∩ ¬ b
0	0	0	0
0	0	1	0
0	1	0	0
0	1	1	0
1	0	0	1
1	0	1	0
1	1	0	0
1	1	1	0