

# Zadanie 1

niedziela, 23 marca 2025 16:10

$$P_8 = P_{11} = B\bar{C} \cup AB$$

$$AB = \neg(\text{NAND}(A, B)) = \text{NAND}(\text{NAND}(A, B), \text{NAND}(A, B))$$

$$B\bar{C} = B \cap (\text{NAND}(C, C)) = \neg(\text{NAND}(B, \text{NAND}(C, C))) =$$

$$= \text{NAND}(\text{NAND}(B, \text{NAND}(C, C)), \text{NAND}(B, \text{NAND}(C, C)))$$

$$AB \cup B\bar{C} = \text{NAND}(\text{NAND}(AB, AB), \text{NAND}(B\bar{C}, B\bar{C}))$$

AB \ C	0	1
00		
01	1	
11	1	1
10		

KMap

AB \ C	0	1
00		
01	1	
11	1	1
10		

Boolean Algebra

$B\bar{C} + AB$

$$P_9 = P_{10} = \bar{A} \cup \bar{B}\bar{C} \cup BC$$

$$\bar{A} = \text{NAND}(A, A)$$

$$\bar{B}\bar{C} = \text{NAND}(B, B) \cap \text{NAND}(C, C) = \neg(\text{NAND}(\text{NAND}(B, B), \text{NAND}(C, C)))$$

$$= \text{NAND}(\text{NAND}(\text{NAND}(B, B), \text{NAND}(C, C)), \text{NAND}(\text{NAND}(B, B), \text{NAND}(C, C)))$$

$$BC = \text{NAND}(\text{NAND}(B, C), \text{NAND}(B, C))$$

$$\bar{A} \cup \bar{B}\bar{C} = \text{NAND}(\text{NAND}(\bar{A}, \bar{A}), \text{NAND}(\bar{B}\bar{C}, \bar{B}\bar{C}))$$

$$\bar{A} \cup \bar{B}\bar{C} \cup BC = \text{NAND}(\text{NAND}(\bar{A} \cup \bar{B}\bar{C}, \bar{A} \cup \bar{B}\bar{C}), \text{NAND}(BC, BC))$$

AB \ C	0	1
00	1	1
01	1	1
11		1
10	1	

KMap

AB \ C	0	1
00	1	1
01	1	1
11		1
10	1	

Boolean Algebra

$\bar{A} + \bar{B}\bar{C} + BC$

$$P_{12} = P_{15} = \bar{A}\bar{B}$$

$$\bar{A}\bar{B} = \text{NAND}(A, A) \cap \text{NAND}(B, B) =$$

$$= \neg(\text{NAND}(\text{NAND}(A, A), \text{NAND}(B, B))) =$$

$$= \text{NAND}(\text{NAND}(\text{NAND}(A, A), \text{NAND}(B, B)), \text{NAND}(\text{NAND}(A, A), \text{NAND}(B, B)))$$

AB \ C	0	1
00	1	1
01		
11		
10		

KMap

AB \ C	0	1
00	1	1
01		
11		
10		

Boolean Algebra

$\bar{A}\bar{B}$

$$P_{13} = P_{14} = A + \bar{B}\bar{C}$$

$\backslash C$	0	1
$A \backslash B$		
00	0	
01		
11	0	0
10	0	0

$\backslash C$	0	1
$A \backslash B$		
00	0	
01		
11	0	0
10	0	0

Boolean Algebra  
 $A + \bar{B}\bar{C}$

$$\bar{B}\bar{C} = \text{NAND}(B, B) \cap \text{NAND}(C, C) =$$

$$= \neg(\text{NAND}(B, B) \cap \text{NAND}(C, C)) =$$

$$= \text{NAND}(\text{NAND}(\text{NAND}(B, B), \text{NAND}(C, C)), \text{NAND}(\text{NAND}(B, B), \text{NAND}(C, C)))$$

$$A + \bar{B}\bar{C} = \text{NAND}(\text{NAND}(A, A), \text{NAND}(\bar{B}\bar{C}, \bar{B}\bar{C})) =$$

$$= \text{NAND}(\text{NAND}(A, A), \text{NAND}(\text{NAND}(B, B), \text{NAND}(C, C)))$$

const 1

$$1 = A \cup \bar{A} = A \cup (\text{NAND}(A, A)) = \text{NAND}(\text{NAND}(A, A), \text{NAND}(\text{NAND}(A, A), \text{NAND}(A, A)))$$

const 0

$$0 = A \cap A' = A \cap (\text{NAND}(A, A)) = \text{NAND}(\text{NAND}(A, A), \text{NAND}(\text{NAND}(A, A), \text{NAND}(A, A)))$$