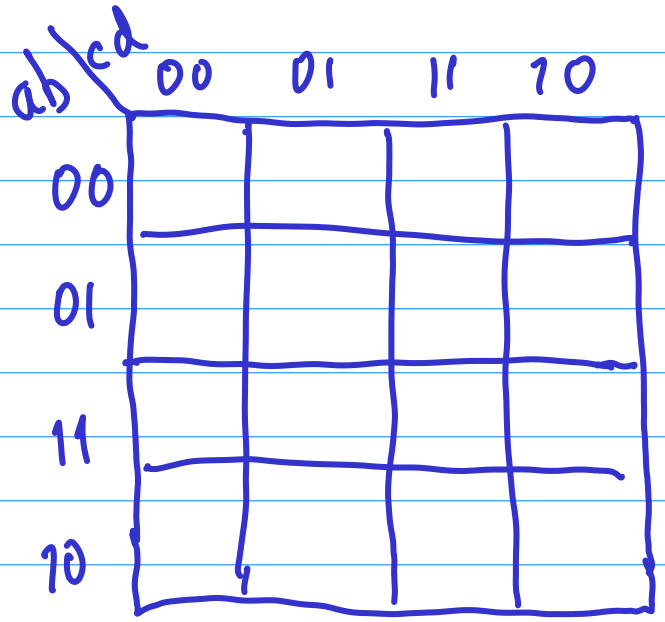
MAC0329

19.05.2020



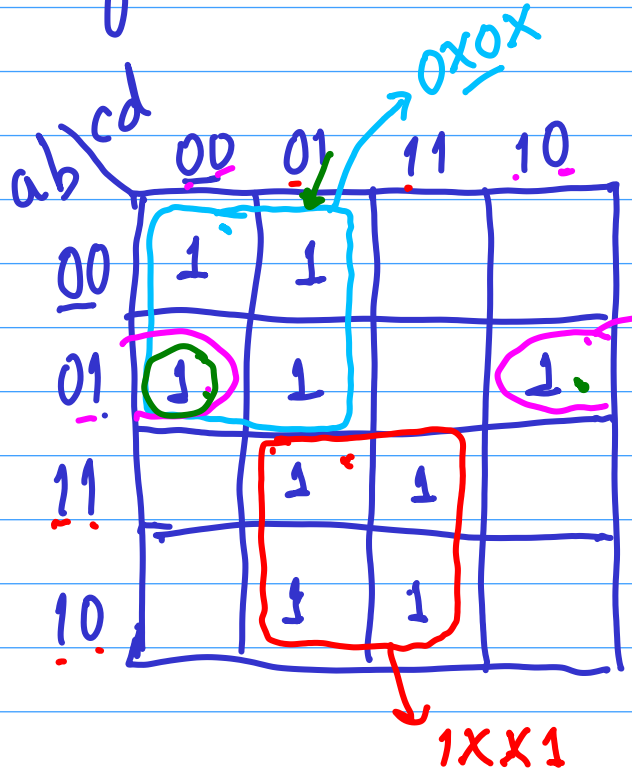
Bom dia!

Exercício : Minimizar usando mapa de Karnaugh

$$f(a,b,c,d) = \sum m(0,1,4,5,6,9,11,13,15)$$

0000, 0001, 0101, 0110, 1001, 1011, 1101, 1111

0100



$$f(a,b,c,d) = \bar{a}\bar{c} + ad + \bar{a}b\bar{d}$$

$01X0 = \{0100, 0110\}$

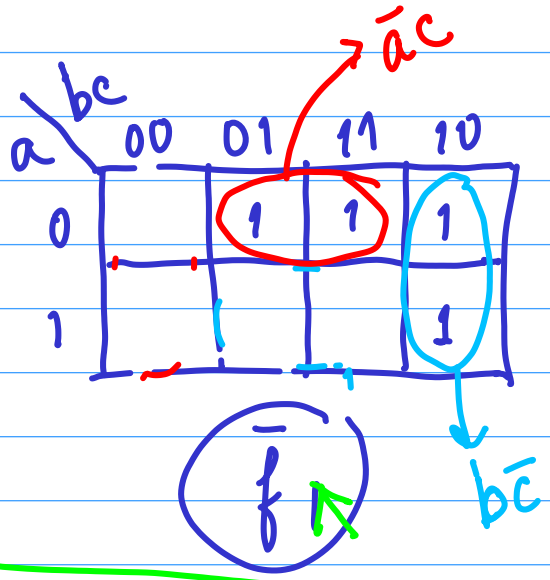
$\bar{a}b\bar{c}\bar{d} + \bar{a}bc\bar{d}$

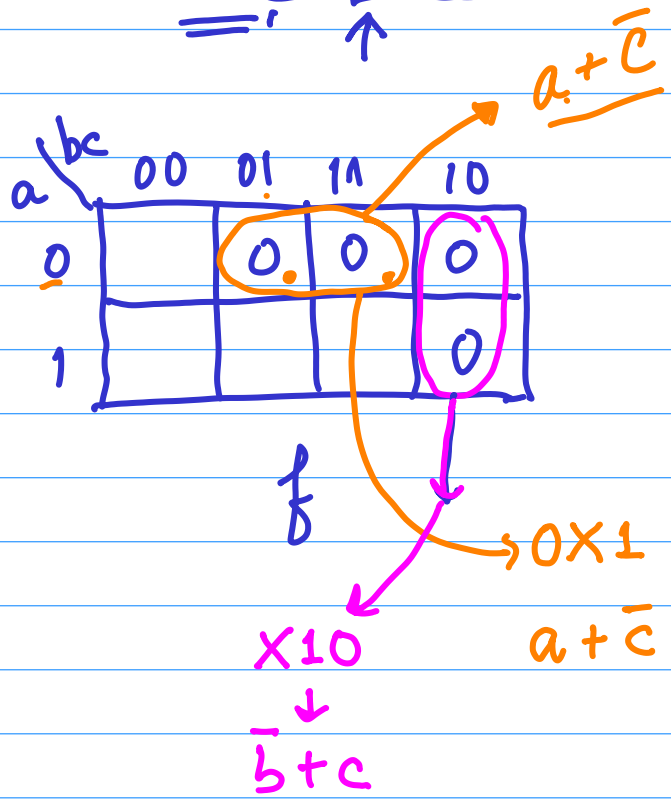
$\bar{a}b\bar{d}(\bar{c} + c) = \bar{a}b\bar{d}$

$(\bar{c} + c) = 1$

Soma de mintermos / produto de maxtermos

$$f(a,b,c) = \sum m(0,4,5,7) = \prod M(1,2,3,6)$$





$\bar{f}(a,b,c) = \bar{a}c + b\bar{c}$

$f = \bar{\bar{f}} \Rightarrow f(a,b,c) = \bar{a}c + b\bar{c}$

$= (\bar{a}c)\cdot(b\bar{c})$

$= (a+\bar{c})(\bar{b}+c)$

$f(a,b,c) = (a+\bar{c})(\bar{b}+c)$

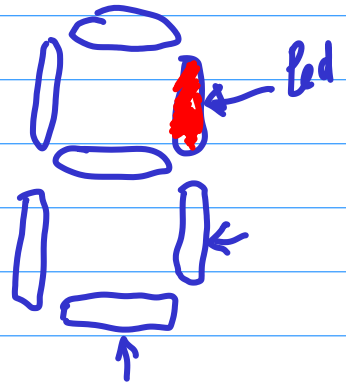
Don't care

Ex. onde ocorre don't care

BCD → Binary coded decimal

0, 1, ..., 9

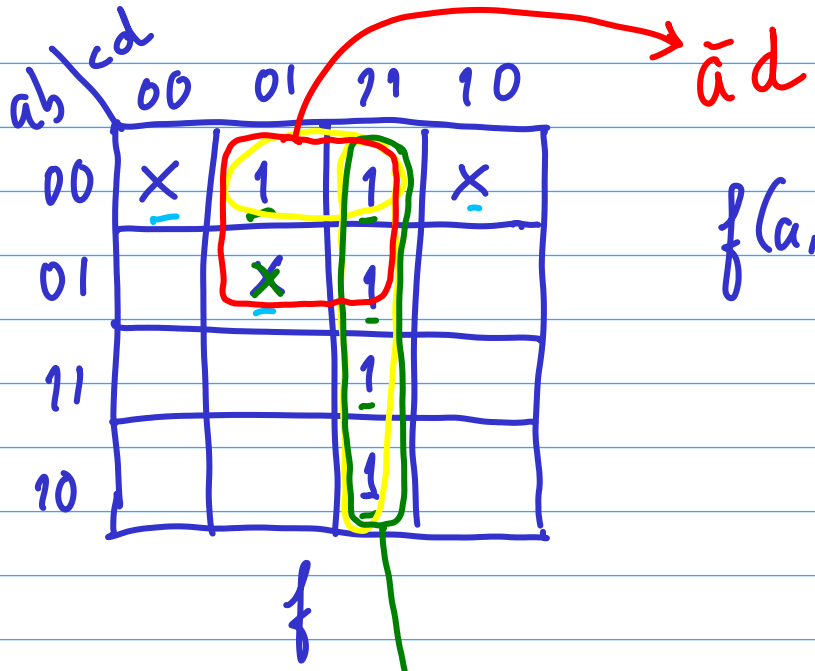
→ 0000 ⇝ 1001



1010 ⇝ 1111 ⇐ don't cares

O valor da função p/ essas entradas não importa.

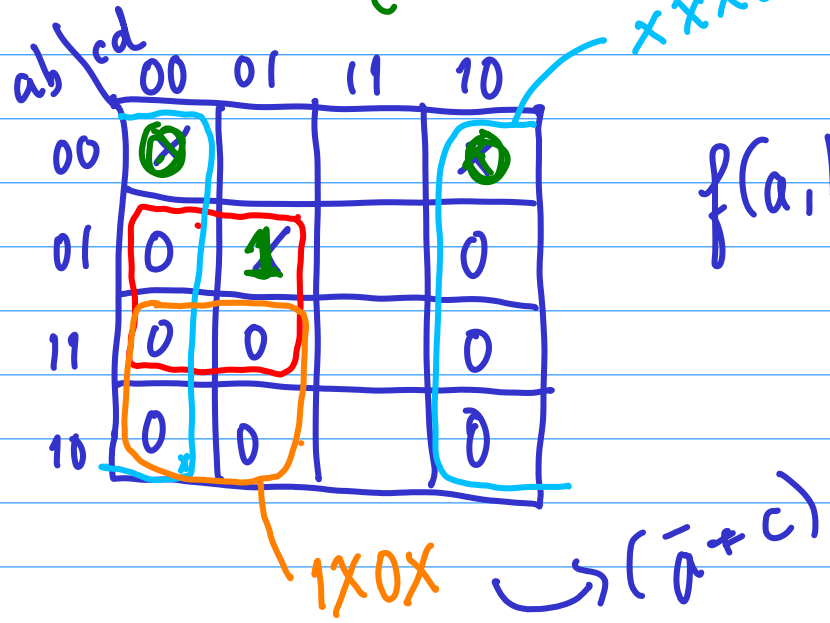
f'	x	f(x)
0	0000	1
1	0001	1
2	0010	1
3	0011	1
4	0100	1
5	0101	0
6	0110	0
7	0111	1
8	1000	1
9	1001	1
		X



$$f(a,b,c,d) = \underbrace{cd}_{E} + \underbrace{\bar{a}d}_{E} \quad \underbrace{\qquad}_{OU}$$

3 pontos

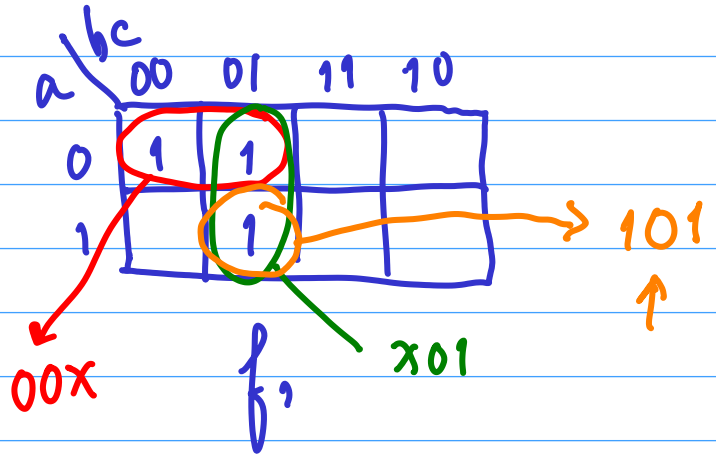
cd

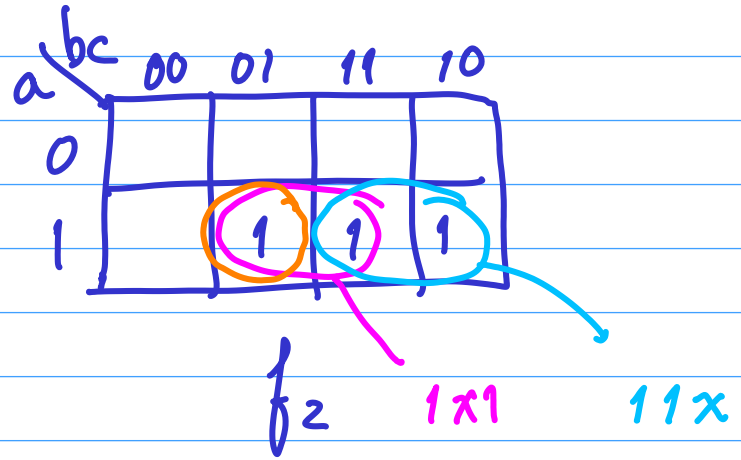


$$f(a,b,c,d) = d \cdot \underbrace{(\bar{a} + c)}_{OU} \quad \underbrace{\qquad}_{E}$$

2 pontos

Minimização de múltiplas funções





$f_1(a,b,c) = \bar{a}\bar{b} + \bar{b}c$

3 portas

$= \bar{a}\bar{b} + a\bar{b}c$

$\bar{b}(\bar{a} + ac)$

$\bar{b}.(\bar{a} + c)$ ←

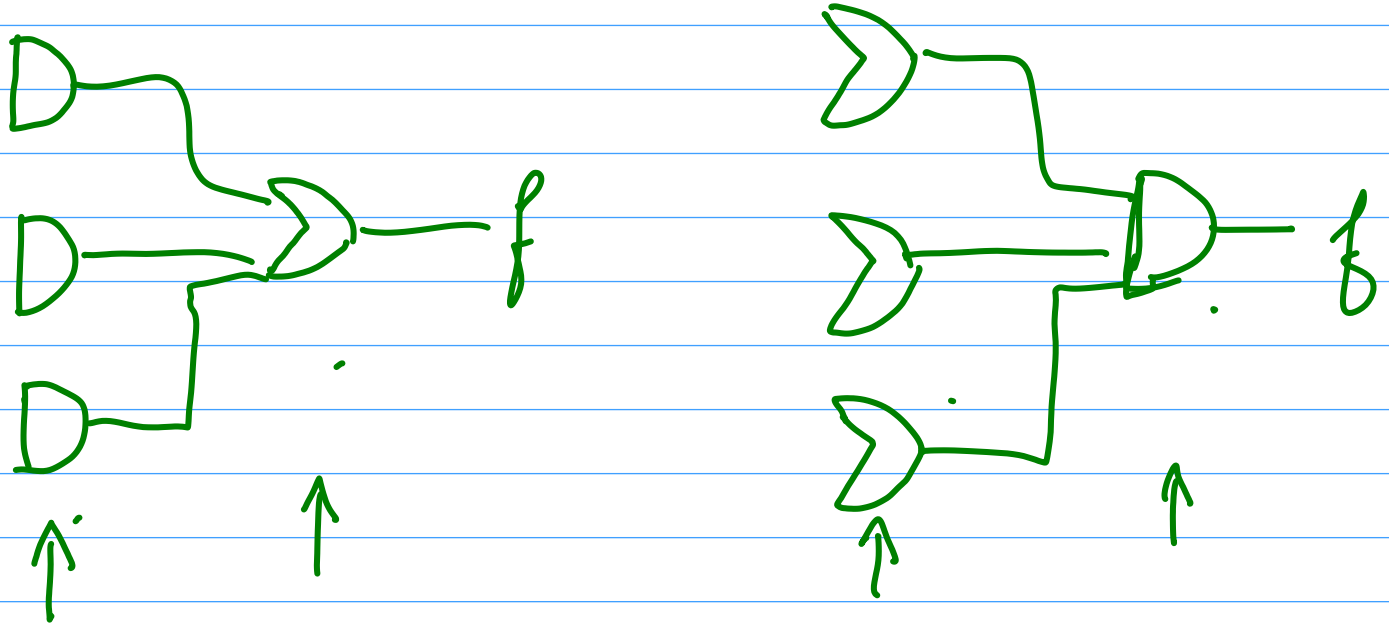
$f_2(a,b,c) = ac + ab$ ⇒ 6 portas

3 portas

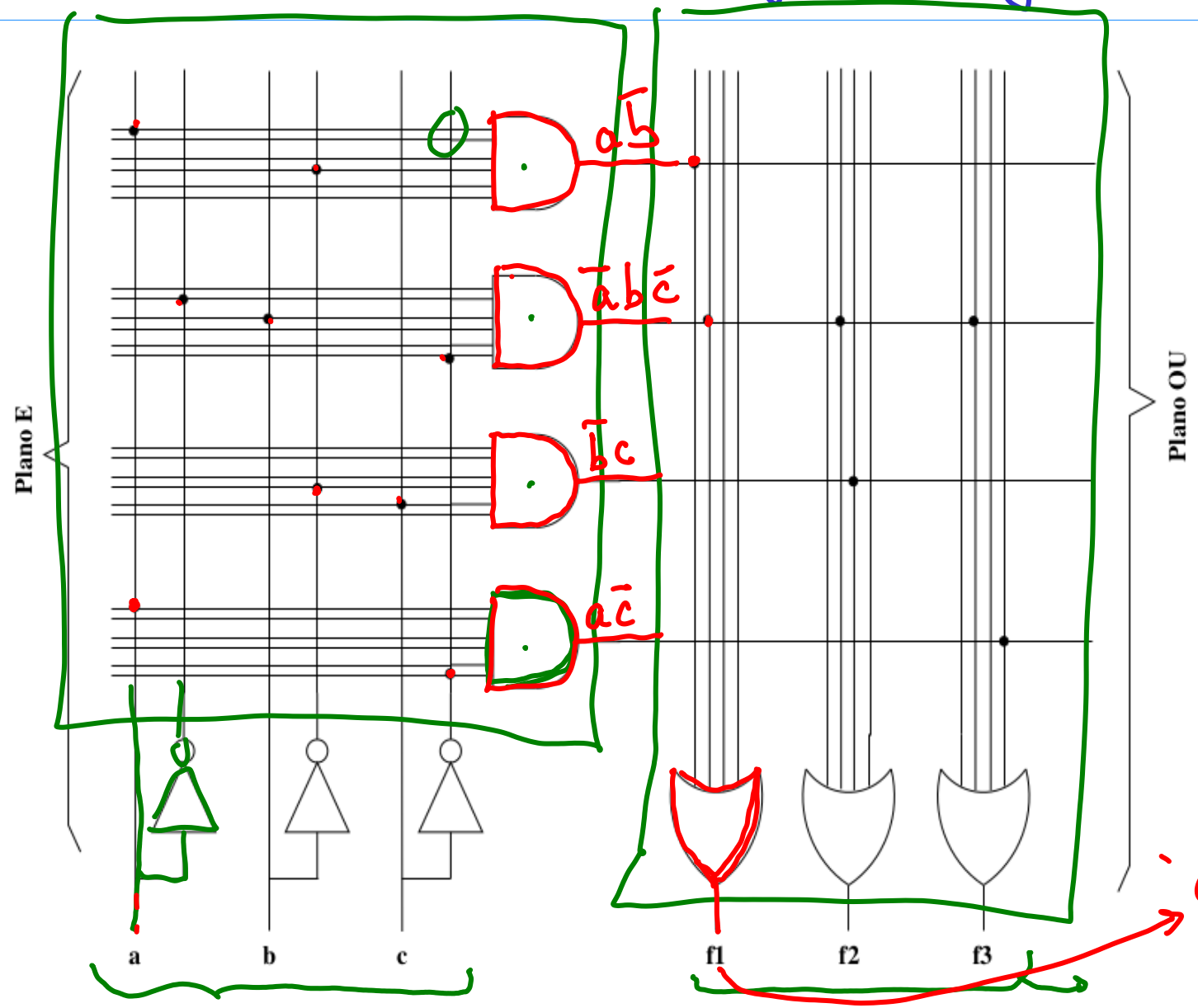
$= ab + a\bar{b}c$

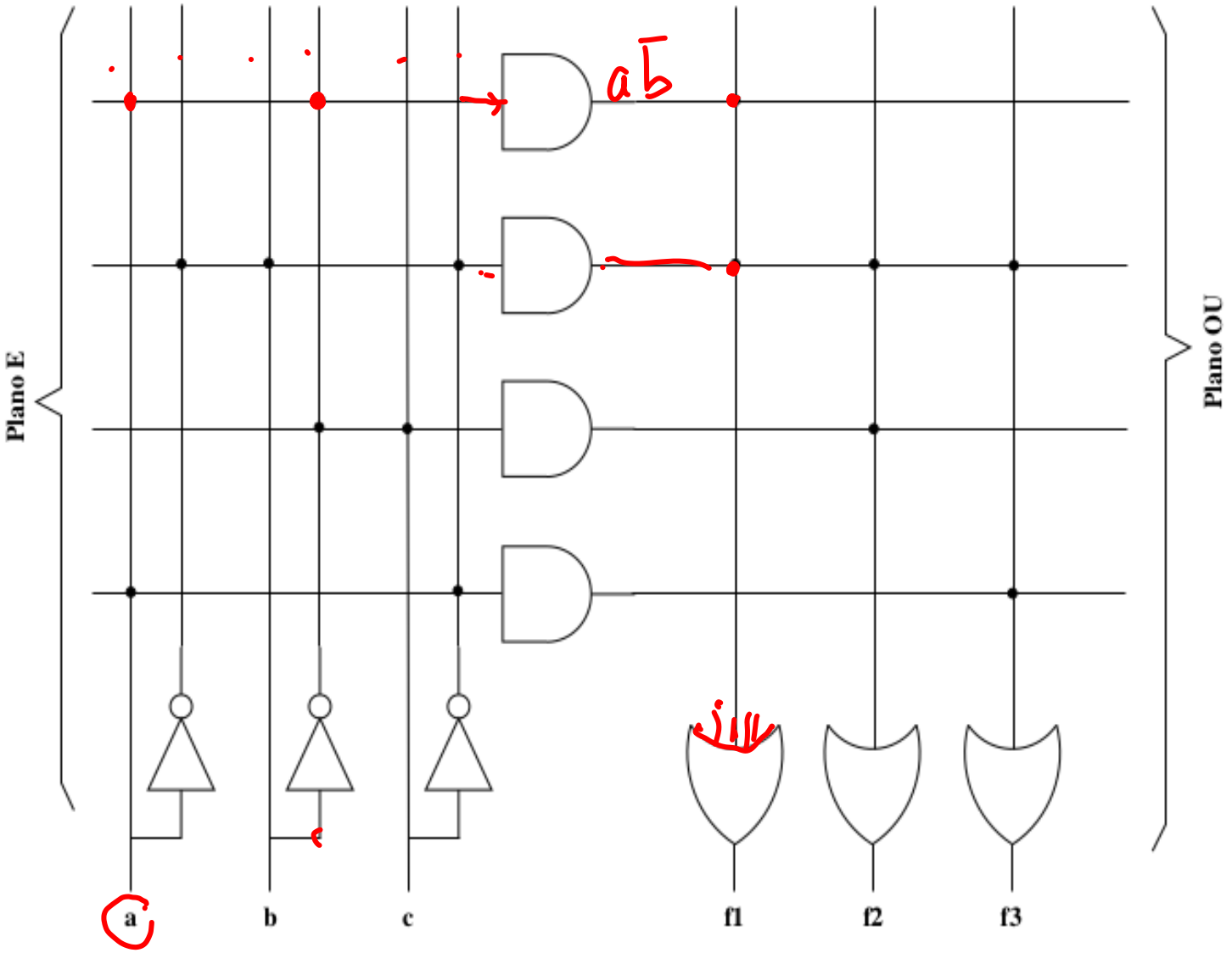
3 portas E + 2 portas OU ⇒ 5 portas

$a(b + c)$ ←


f
f

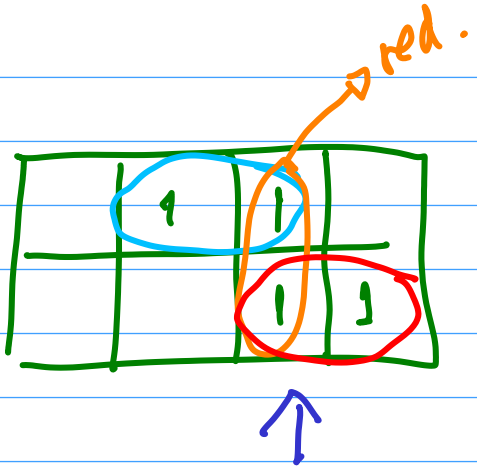
PLA - Programmable Logic Arrays




Plano E
Plano OU
a
b
c
f1
f2
f3

QM (Quine - McCluskey)

$$f(a,b,c) = \sum m(0,1,4,5,6)$$



000, 001, 100, 101, 110