

(a) 2^n

(b) Yes (double inverter or nothing)

(c)

		Δ	Δ
1	1	1	0
1	0	0	1
0	1	0	1
0	0	0	1

		Δ	Δ
1	1	0	0
1	0	0	1
0	1	1	0
0	0	1	1

a)

x_1	x_2	x_3	p_2	p_x	$\overline{p_2}$	p_1	p_3	p_4	9	8
0	0	0	0	0	1	0	0	0	0	0
0	0	1	0	0	1	0	0	1	1	0
0	1	0	0	1	1	1	0	1	1	0
0	1	1	0	1	1	1	1	1	0	1
1	0	0	0	1	1	1	0	1	1	0
1	0	1	0	1	1	1	1	1	0	1
1	1	0	1	1	0	0	0	0	0	1
1	1	1	1	1	0	0	0	1	1	1

x_1

Exercice 2

(a)

(i) $[\bar{a} + b] \cdot \bar{c}$

(ii) $a + (\bar{b} \cdot c)$

(iii) $[\bar{b} + c] \cdot a + b$

(b)

(i)
$$\begin{aligned} f &= ab(\bar{b}c + ac) \\ &= ab\bar{b}c + abac \\ &= 0 + abc \\ &= abc \end{aligned}$$

$$\begin{aligned}
 \textcircled{\text{ii}} \quad f &= ab + a\bar{b} + ac + b\bar{b} + bc \\
 &= ac + ab + b + b\bar{c} \\
 &= ac + b(a + 1 + c) \\
 &= ac + b
 \end{aligned}$$

$$\textcircled{\text{iii}} \quad f =$$

$$\begin{aligned}
 &[a + \cancel{a\bar{b}} + \cancel{ac} + \cancel{\bar{b}a} + \bar{b}\bar{b} \\
 &\quad + \cancel{\bar{b}c} + \cancel{\bar{c}a} + \cancel{\bar{c}b} + \bar{c}c] \\
 &[a + b + \bar{c}]
 \end{aligned}$$

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

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

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

$$\textcircled{c} \textcircled{i} \quad a + bc$$

$$= (12.b) (a+b)(a+c)$$

distributive

\textcircled{ii}

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

$$= a + b\bar{b} \quad (12.b)$$

$$= a + 0 \quad (8.a)$$

$$= \underline{a}$$