Soma de minitermos

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

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

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

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

$= m_7 + m_6 + m_5 + m_4 + m_1 + m_0$

$= m_0 + m_1 + m_4 + m_5 + m_6 + m_7$

$= \sum(0, 1, 4, 5, 6, 7)$

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

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

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

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

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

$= m_7 + m_6 + m_5 + m_4 + m_3 + m_2 + m_0$

$= \sum(0, 2, 3, 4, 5, 6, 7)$

c) $F(a,b,c,d) = \overline{(ab + bc\bar{d})} + \bar{a}c\bar{d}$

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

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

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

$= \bar{a}\bar{b}cd + \bar{a}\bar{b}c\bar{d} + \bar{a}\bar{b}\bar{c}d + \bar{a}\bar{b}\bar{c}\bar{d} + \bar{a}b\bar{c}d + \bar{a}b\bar{c}\bar{d} + \bar{a}\bar{b}\bar{c}d + \bar{a}\bar{b}cd + \bar{a}b\bar{c}d + \bar{a}bcd + a\bar{b}cd + a\bar{b}c\bar{d} + a\bar{b}\bar{c}d + a\bar{b}\bar{c}\bar{d} + \bar{a}\bar{b}cd + \bar{a}b\bar{c}d + \bar{a}\bar{b}\bar{c}d + \bar{a}\bar{b}c\bar{d} + a\bar{b}\bar{c}d + a\bar{b}cd + \bar{a}b\bar{c}d + \bar{a}bc\bar{d} + a\bar{b}cd + a\bar{b}\bar{c}d + \bar{a}\bar{b}cd + \bar{a}b\bar{c}d + \bar{a}\bar{b}cd + \bar{a}b\bar{c}\bar{d} + \bar{a}bcd + \bar{a}\bar{b}cd$

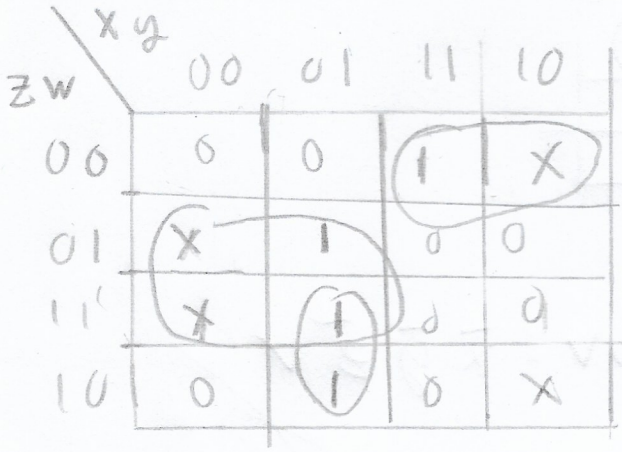
$= \bar{a}\bar{b}cd + \bar{a}\bar{b}c\bar{d} + \bar{a}\bar{b}\bar{c}d + \bar{a}\bar{b}\bar{c}\bar{d} + \bar{a}b\bar{c}d + \bar{a}bcd + a\bar{b}cd + a\bar{b}c\bar{d} + a\bar{b}\bar{c}d + a\bar{b}\bar{c}\bar{d}$

$= m_3 + m_2 + m_1 + m_0 + m_5 + m_7 + m_{11} + m_{10} + m_9 + m_8 + m_6$

$= \sum(0,1,2,3,5,6,7,8,9,10,11)$

Mapas de Karnaugh

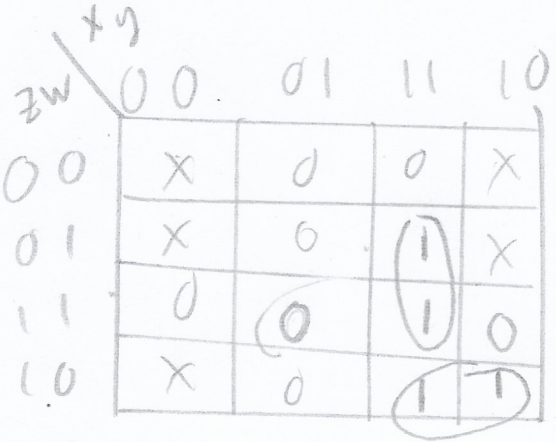
A) $\sum(5, 6, 7, 12) + d(1, 3, 8, 10)$



zw \ xy	00	01	11	10
00	0	0	1	X
01	X	1	0	0
11	X	1	0	0
10	0	1	0	X

$f = \bar{x}w + \bar{x}yz + x\bar{z}\bar{w}$

B) $\pi(10, 13, 14, 15) \cdot d(0, 1, 2, 8, 9)$



zw \ xy	00	01	11	10
00	X	0	0	X
01	X	0	1	X
11	0	0	1	0
10	X	0	1	1

$f = xyw + xz\bar{w}$

c) $f = \sum(1, 2, 3, 8, 12, 23) + d(17)$

xy \ zwv	000	001	011	010	110	111	101	100
00	0	1	1	1	d	0	d	0
01	1	0	d	0	x	d	d	1
11	0	d	d	d	d	0	d	d
10	0	0	d	d	d	1	d	d

$f = \bar{x}\bar{y}\bar{z}w + \bar{x}y\bar{w}\bar{v} + x\bar{y}zwv + \bar{x}\bar{y}\bar{z}v$