① $x \downarrow (y \uparrow z) \neq (x \downarrow y) \uparrow (x \downarrow z)$

$[x + (yz)']' \neq [(x+y)' \cdot (x+z)']'$

דוגמה: 010

$[0 + (1 \cdot 0)']' \neq [(0+1)' \cdot (0+0)']'$

$[0+1]' \neq [0 \cdot 1]'$

$[0] \neq [1]$

③

xyz	f_1	f_2
000	1	0
001	1	1
010	1	1
011	0	1
100	0	1
101	0	0
110	1	1
111	1	0

$F_1(x,y,z) = x'y'z + x'yz + x'y'z' + xy'z' + xyz =$

$M_0 \cdot M_1 \cdot M_2 \cdot M_6 \cdot M_7 =$

$\Sigma(0,1,2,6,7) = \Pi(3,4,5)$

$F_2(x,y,z) = x'y'z + xy'z + x'yz + xyz' =$

$\rightarrow M_1 \cdot M_2 \cdot M_3 \cdot M_4 \cdot M_6 =$

$\Sigma(1,2,3,4,6) = \Pi(0,5,7)$

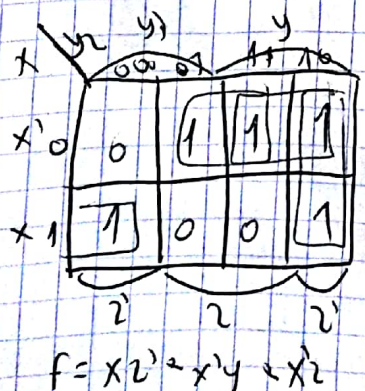
$F_1(x,y,z) = (x'+y+z)(x+y'+z')(x+y'+z) = M_3 \cdot M_4 \cdot M_5 =$

$\Pi(3,4,5)$

$F_2(x,y,z) = (x'+y'+z)(x+y'+z)(x+y+z) = M_0 \cdot M_5 \cdot M_7 =$

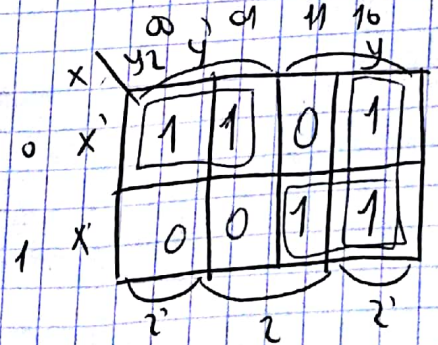
$\Pi(0,5,7)$

② f_2



$f = xz' + x'y + x'z$

f_1



$f = x'y' + xy + xyz'$

$F' = xy' + x'y_2$ f_1 ② ③

$(F')' = (x'+y)(x+y'+z')$

F_2

$F' = xz + x'y_2'$

$(F')' = (x'+z')(x+y+z)$

$F(A,B,C,D) = \Pi(1,2,3,4,6,12,14)$

$F = AB' + DB + CB'D'$

$F' = DB + DB' + CB'D'$

$(F')' = (D+B')(D'+B)(C'+B+D)$

AB \ CD	C' D'	C' D	C D	C D'
A' B'	1	0	0	0
A' B	0	1	1	0
A B	0	1	1	0
A B'	1	1	1	1

⑯ ④

$F(A,B,C,D) = (A'+B'+D)(A'+B+D')(A'+B+C'+D)$ ②

$F' = ABD' + AB'D + AB'CD$

AB \ CD	C' D'	C' D	C D	C D'
A' B'	1	1	1	1
A' B	1	1	1	1
A B	0	1	1	0
A B'	1	0	0	1

$F = A' + ABD + AB'D'$

$F' = AB'D' + AB'D$

$(F')' = (A'+B'+D)(A'+B+D')$

(2)

$F(A,B,C,D) = AB' + A'D + ABC'D$

$F = C'D + AB' + A'D$

$F' = BD' + B'D' + ABCD$

$(F')' = (B'+D)(B+D)(A'+B'+C'+D')$

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

(5)

$F(w,x,y,z) = \Sigma(4,5,7,12,14,15)$

$d(wxyz) = \Sigma(1,3,9,11,13)$

$f = z + xy' + xw$

wx \ yz	00	01	11	10
00		X	X	
01	1	1	1	
11	1	X	1	1
10		X	X	

(7)

$M_{11} = 1011$ (wxyz)

לכן:

$f(w,x,y,z) =$

$F = 1 + 0 \cdot 1' + 0 \cdot 1 = 1$

ניקח את הערך 1

(6)

$F(w,x,y,z) = x' + xyz + x'y'z + wx'y$

F_1

wx \ yz	00	01	11	10
00	1	1	1	1
01	0	0	1	0
11	0	0	1	0
10	1	1	1	1

$F(w,x,y,z) = (w'+x'+y')(w+z')(w+x)$

$F = wxy + w'z + w'x'$

F_2

wx \ yz	00	01	11	10
00	0	0	0	0
01	1	0	0	1
11	1	1	0	0
10	1	1	1	1

F₁ ③

$F(w,x,y,z) = \Sigma(0,1,2,3,7,8,9,10,11,15)$

$F(w,x,y,z) = \Pi(4,5,6,12,13,14)$

F₂

$F(w,x,y,z) = \Sigma(4,6,8,9,10,11,12,13)$

$F(w,x,y,z) = \Pi(0,1,2,3,5,7,14,15)$

F₁ ②

$F = x' + zy$

$F' = xy' + xz'$

$(F')' = (x'+y)(x'+z)$

F₂

$F = wx' + wy' + w'xz'$

$F' = w'x' + w'z + wxy$

$(F')' = (w+x)(w+z')(w'+x'+y)$

ד) א) $F = \Sigma(0,5,10,15)$

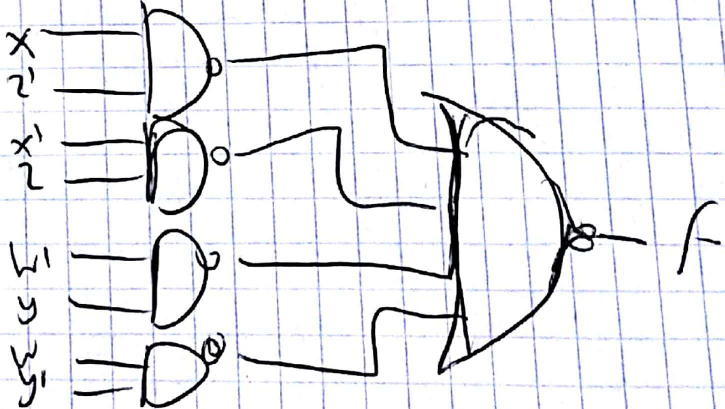
wx \ yz	y'z'	y'z	yz	yz'
w'x'	1	0	0	0
w'x	0	1	0	0
wx	0	0	1	0
wx'	0	0	0	1

משום האפסים קבלנו
כיוון שאנו לוקחים
את האפסים

$F' = wy' + w'y + x'z + xz'$

$(F')' = (w'+y)(w+y')(x+z')(x'+z)$

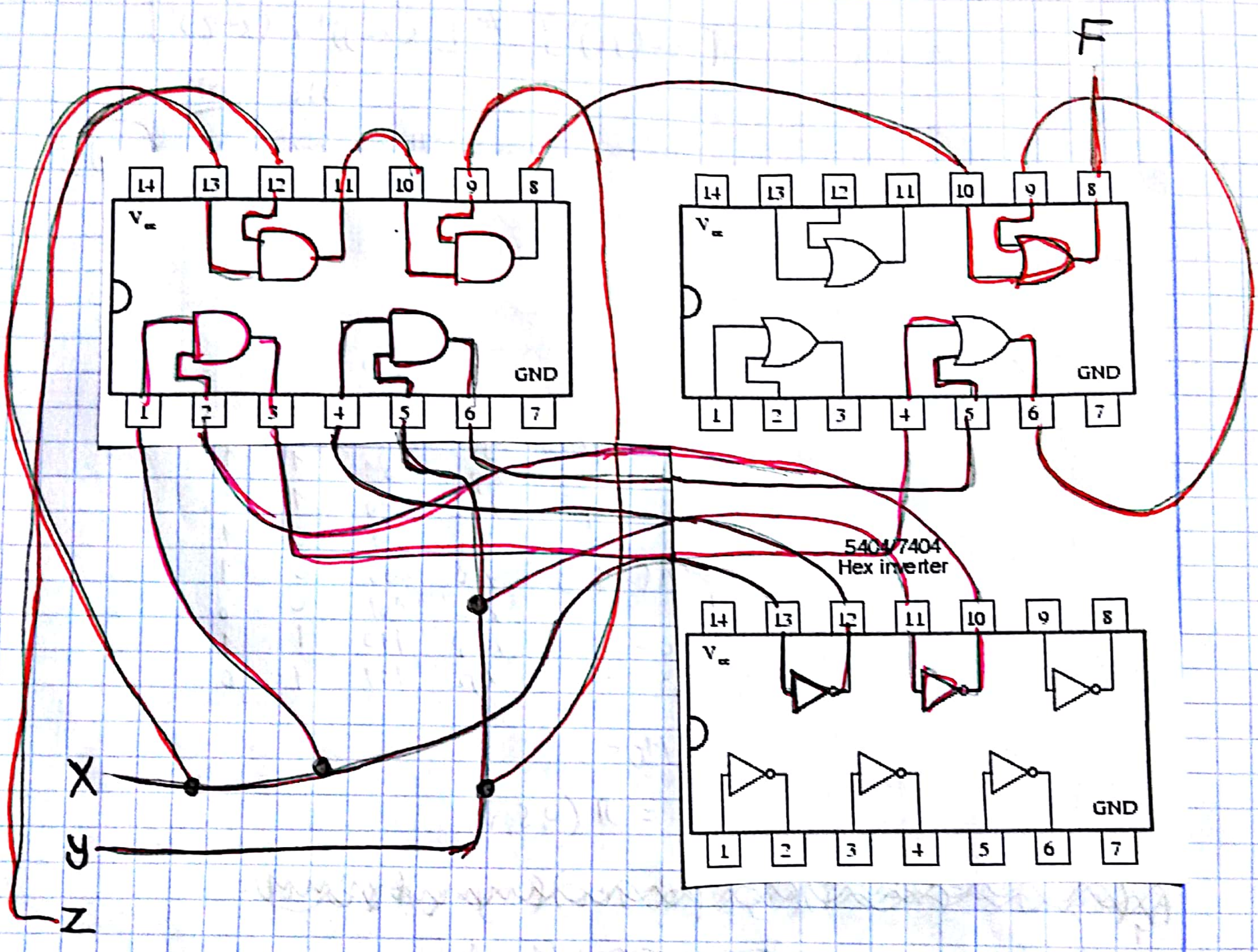
ב)



בס״ד

(א) (2)

$F = x'y + xy' + xyz$



(ב) 3 תיאור
כינוי

$x' =$ NOT מהפכים

$x y =$ AND וגם

$x + y =$ OR או