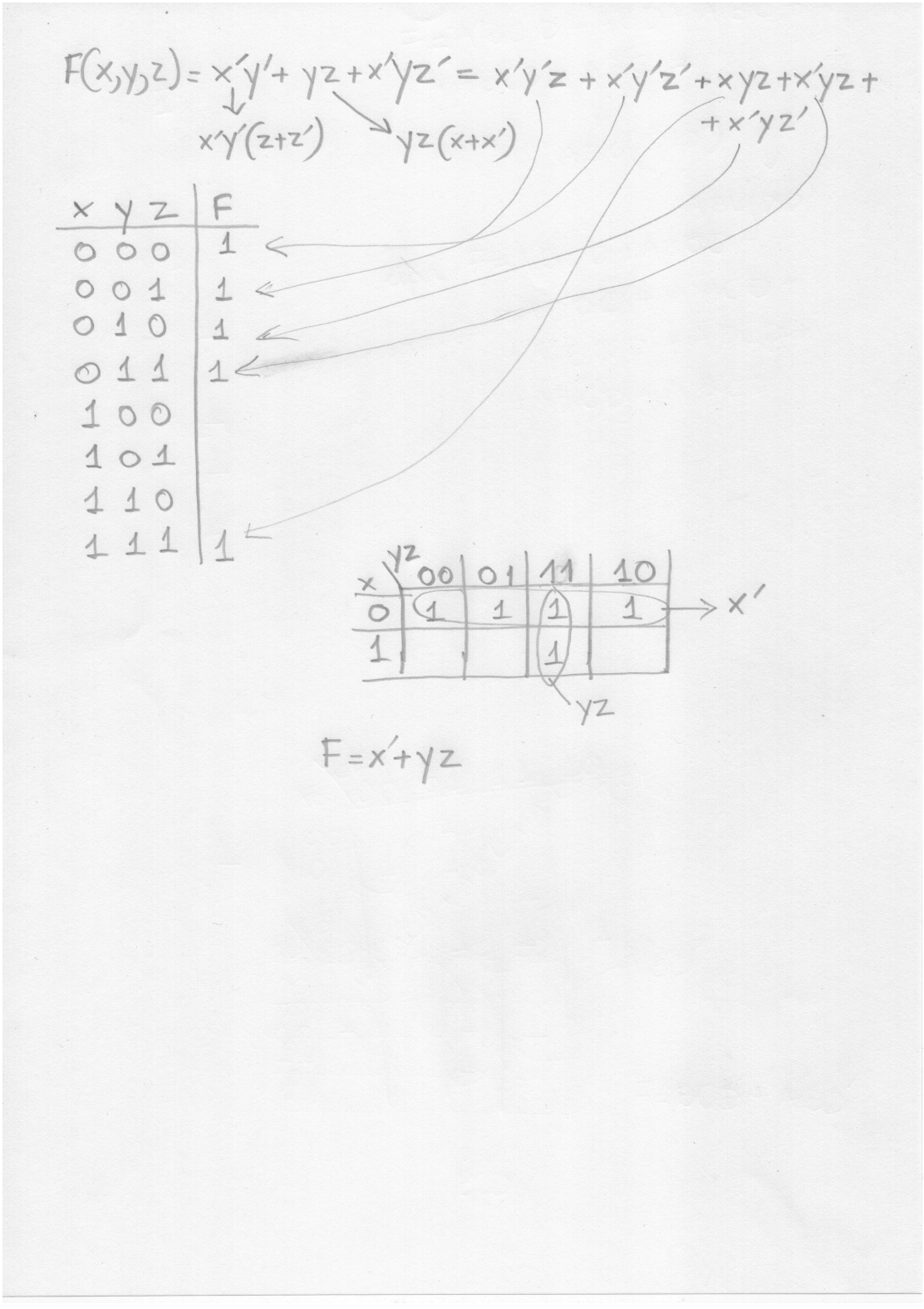
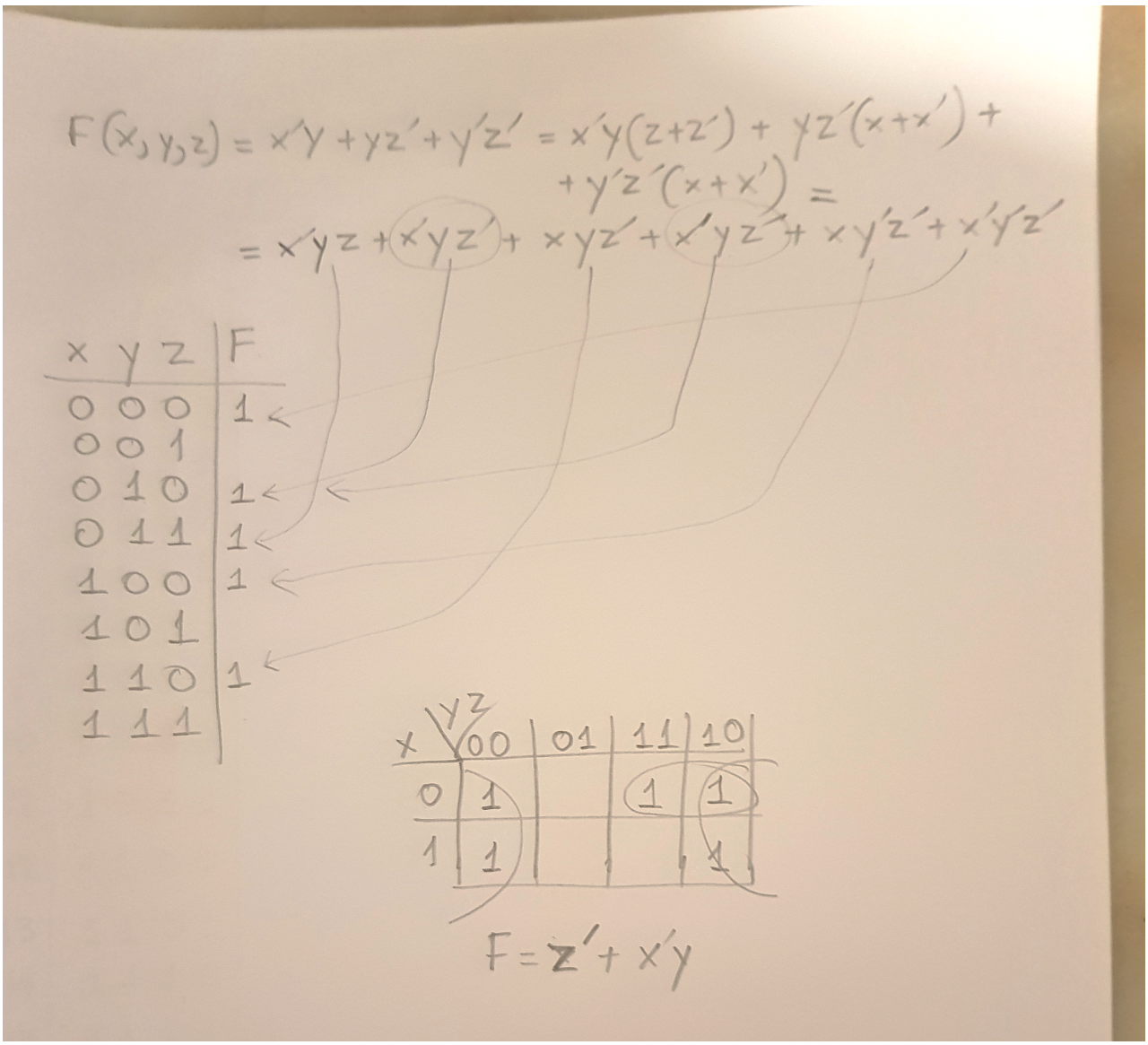
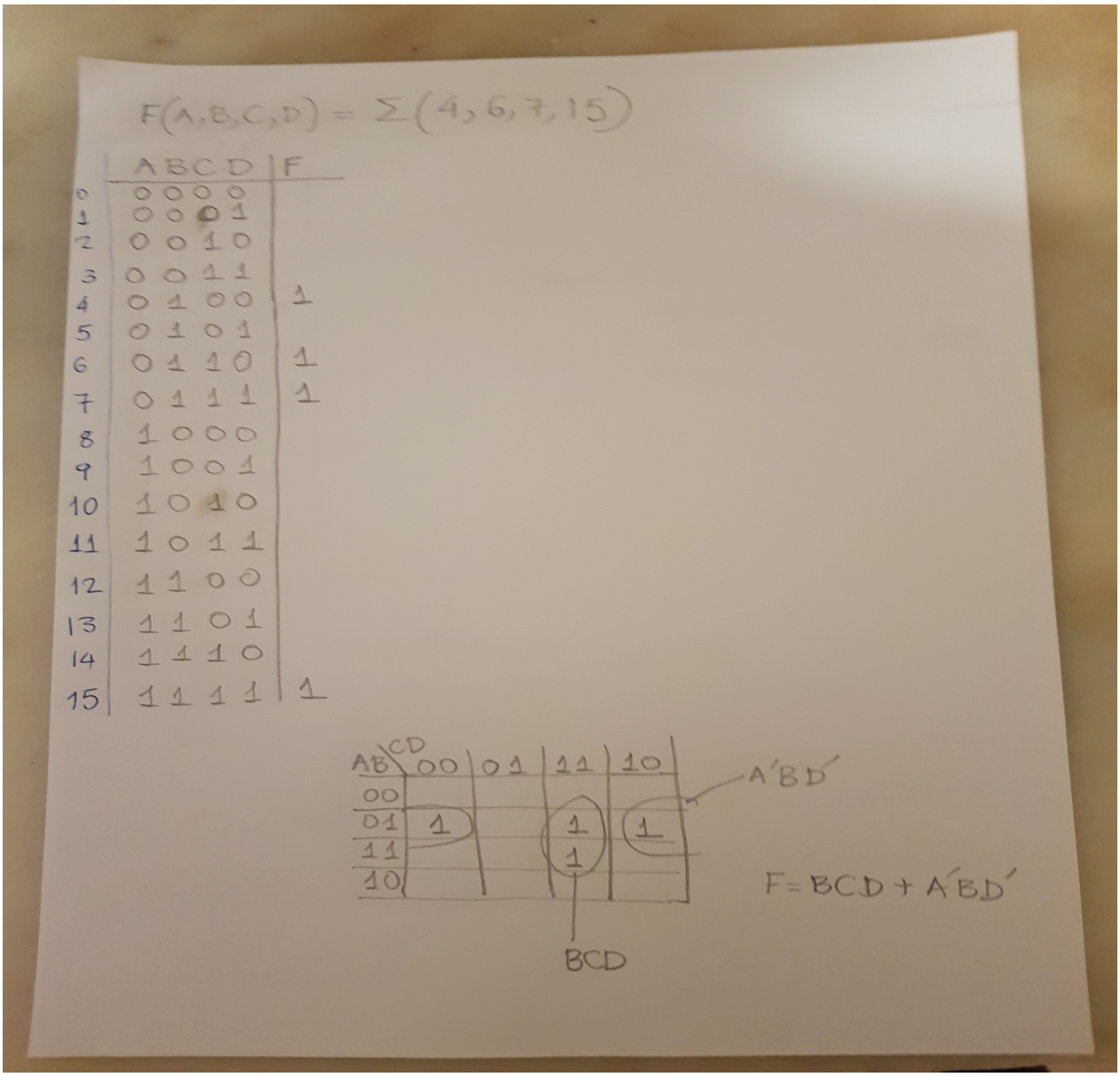
ΑΣΚΗΣΗ 1


F(x,y,z) = x'y' + yz + x'yz' = x'y'z + x'y'z' + xyz + x'yz +
x'y'(z+z')
yz(x+x')
+ x'yz'
x y z | F
0 0 0 | 1
0 0 1 | 1
0 1 0 | 1
0 1 1 | 1
1 0 0
1 0 1
1 1 0
1 1 1 | 1
yz
x
00 01 11 10
0 1 1 1 1
1 1
x'
yz
F = x' + yz

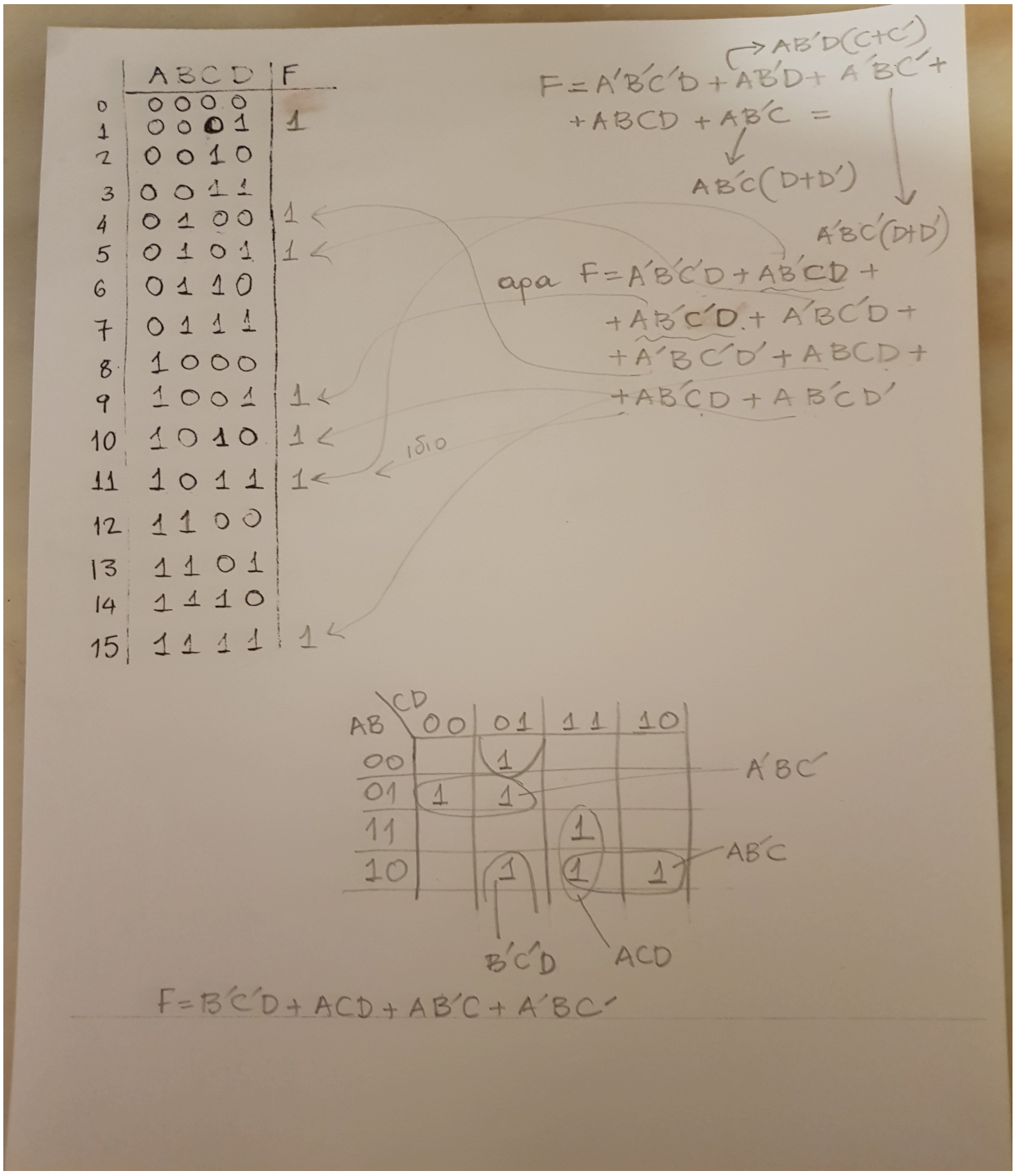
ΑΣΚΗΣΗ 2


F(x,y,z) = x'y + yz' + y'z' = x'y(z+z') + yz'(x+x') +
+ y'z'(x+x') =
= x'yz + x'yz' + xyz' + x'yz' + xy'z' + x'y'z'
x y z | F
0 0 0 | 1
0 0 1
0 1 0 | 1
0 1 1 | 1
1 0 0 | 1
1 0 1
1 1 0 | 1
1 1 1
yz
x | 00 | 01 | 11 | 10
0 | 1 | | 1 | 1
1 | 1 | | | 1
F = z' + x'y

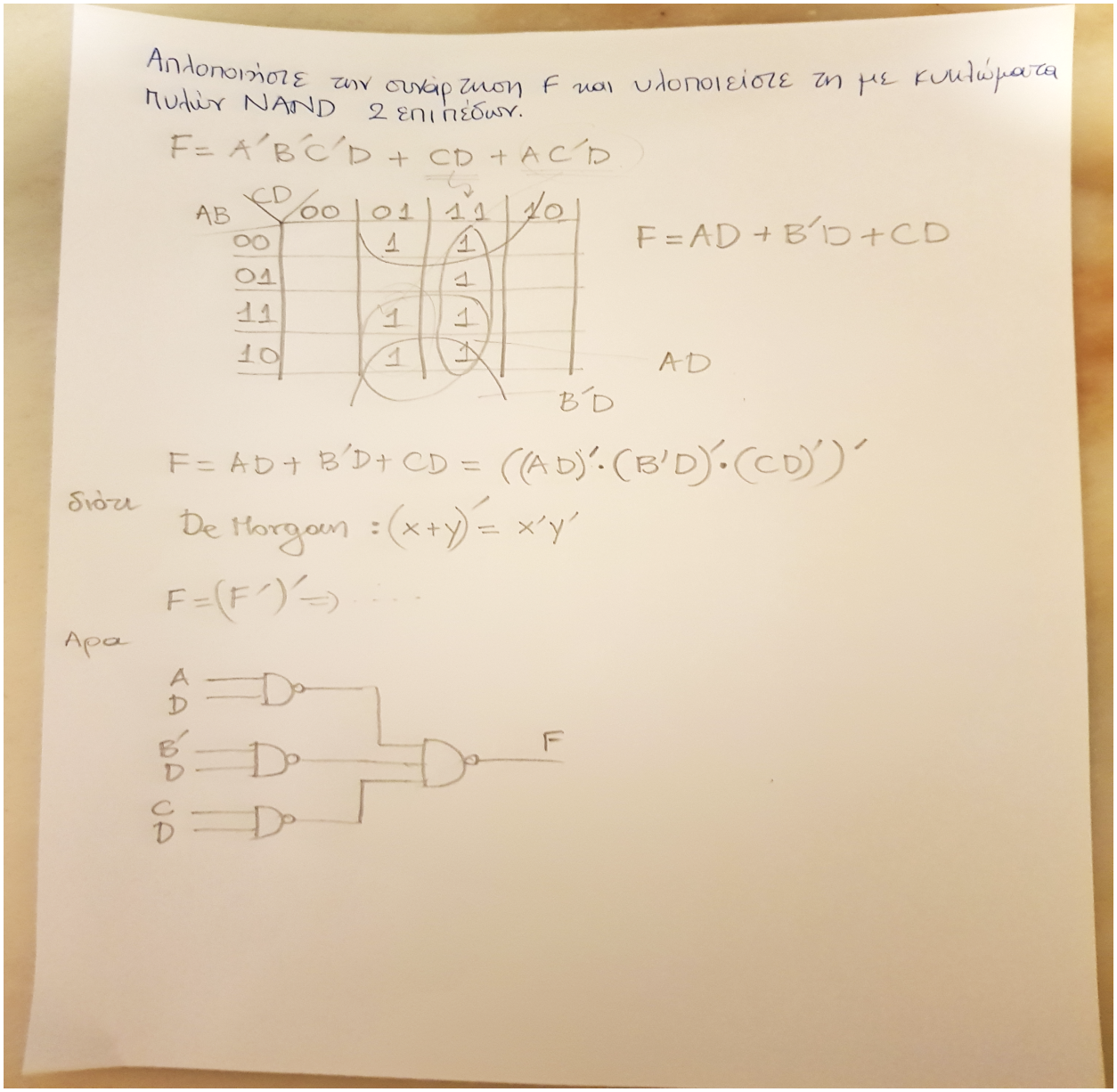
ΑΣΚΗΣΗ 3


F(A,B,C,D) = Σ(4,6,7,15)
A B C D F
0 0 0 0 0
1 0 0 0 1
2 0 0 1 0
3 0 0 1 1
4 0 1 0 0 1
5 0 1 0 1
6 0 1 1 0 1
7 0 1 1 1 1
8 1 0 0 0
9 1 0 0 1
10 1 0 1 0
11 1 0 1 1
12 1 1 0 0
13 1 1 0 1
14 1 1 1 0
15 1 1 1 1 1
AB CD 00 01 11 10
A'B'D'
BCD
F = BCD + A'B'D'

ΑΣΚΗΣΗ 4


A B C D F
0 0 0 0 0
1 0 0 0 1 1
2 0 0 1 0
3 0 0 1 1
4 0 1 0 0 1
5 0 1 0 1 1
6 0 1 1 0
7 0 1 1 1
8 1 0 0 0
9 1 0 0 1 1
10 1 0 1 0 1
11 1 0 1 1 1
12 1 1 0 0
13 1 1 0 1
14 1 1 1 0
15 1 1 1 1 1
F=A'B'C'D+AB'D+A'BC'+
+ABCD+AB'C=
AB'D(C+C')
AB'C(D+D')
A'BC'(D+D')
apa F=A'B'C'D+AB'CD+
+AB'C'D+A'BC'D+
+A'BC'D'+ABCD+
+AB'CD+AB'CD'
ίδιο
CD
AB
00 01 11 10
A'BC'
AB'C
B'C'D
ACD
F=B'C'D+ACD+AB'C+A'BC'

ΑΣΚΗΣΗ 5


Απλοποιήστε την συνάρτηση F και υλοποιείστε τη με κυκλώματα πυλών NAND 2 επιπέδων.
F = A'B'C'D + CD + AC'D
AB
CD
00
01
11
10
F = AD + B'D + CD
AD
B'D
F = AD + B'D + CD = ((AD)'·(B'D)'·(CD)')'
διότι
De Morgan : (x+y)' = x'y'
F = (F')' ⇒
Αρα
A
D
B'
D
C
D
F