You are expected to solve homework problems individually. If needed, you may seek help from your friends. However, do not copy. Show all steps with your solutions for full credit.

**Name: / 50**

1. (10 points) Simplify the following Boolean functions, using three-variable maps:
2. F(x, y, z) = ∑(2, 3, 4, 5)
3. F(x, y, z) = ∑(1, 2, 3, 5, 6, 7)
4. F(x, y, z) = ∑(0, 2, 4, 6)
5. F(x, y, z) = ∑(3, 4, 5, 6, 7)
6. 
7. (16 points) Simplify the following Boolean functions, using four-variable maps:
8. F (A, B, C, D) = ∑(2, 3, 6, 7, 12, 13, 14)
9. F (w, x, y, z) = ∑(1, 3, 4, 5, 6, 7, 9, 11, 13, 15)
10. F (w, x, y, z) = ∑(11, 12, 13, 14, 15)
11. F (w, x, y, z) = ∑(8, 10, 12, 13, 14)
12. (12 points) Simplify the following Boolean expressions, using four-variable maps:
    1. F(A,B,C,D) = A′B′C′D + AB′D + A′BC′ + ABCD + AB′C
    2. F(A,B,C,D)= A′B′C′D′ + BC′D + A′C′D + A′BCD + ACD′
    3. F(A,B,C,D) = AD′ + B′C′D + BCD′+ BC′D
    4. F(w,x,y,z) = wxy + xz + wx′z + w′x
13. (12 points) Simplify the following Boolean function F, together with the don’t-care conditions d.
    1. F(x, y, z) = ∑(0, 1, 4, 5, 6)

d(x, y, z) = (2, 3, 7)

* 1. F(A, B, C, D) = ∑(5, 6, 7, 12, 14, 15)

d(A, B, C, D) = ∑(3, 9, 11)

* 1. F(A, B, C, D) = ∑(4, 12, 7, 2, 10)

d(A, B, C, D) = ∑(0, 6, 8)