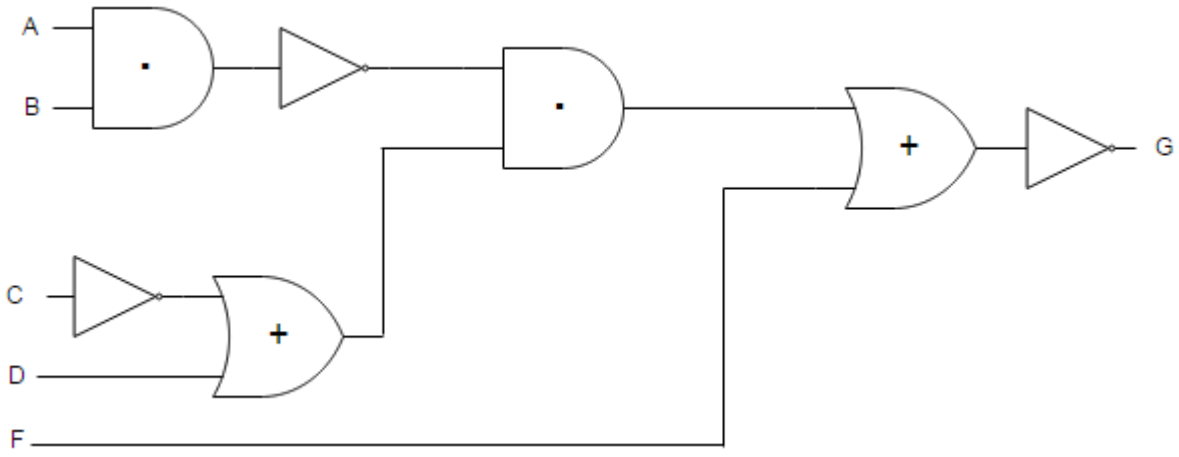
Homework 2

1. Simplify each of the following expressions by applying one of the theorems. State the theorem used.

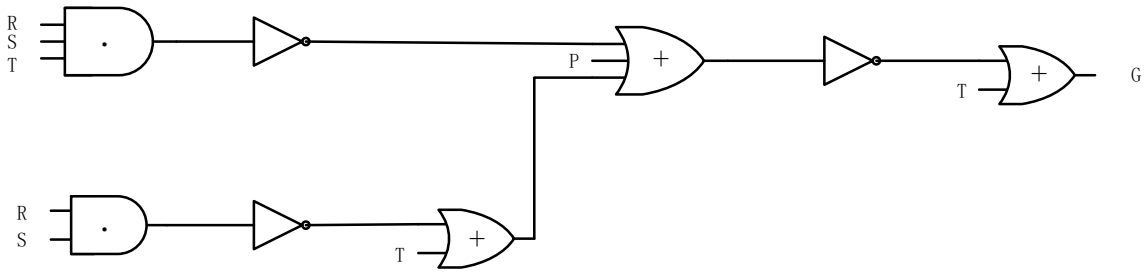
(a) x'yz+xz
(b) XYZ +X'YZ+ XY'Z + (XYZ')'
(c) abc+a'b+abc'
(d) A(C +D'B) + A'B
(e) (D + BC')' + (GE + F)(D+BC')

2. Multiply out and simplify to obtain a sum of products(SOP):
   (a) (ab+c)(b+c'd)
   (b) x'+x(x+y')(y+z')

3. Find G and simplify:

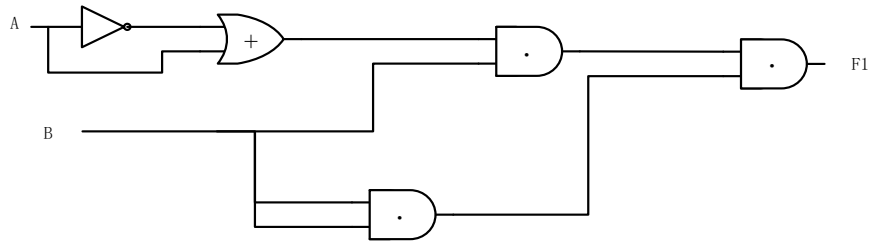


(a)

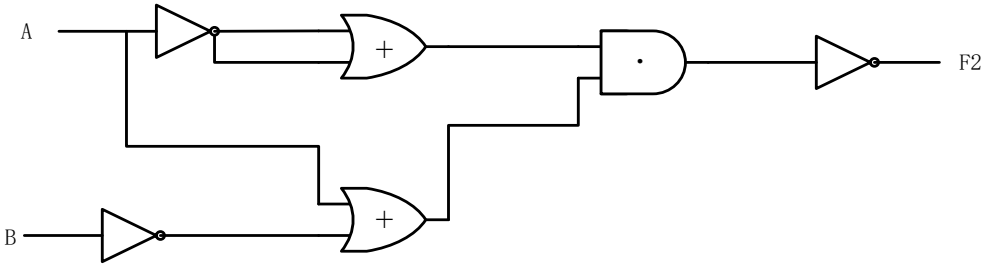


(b)

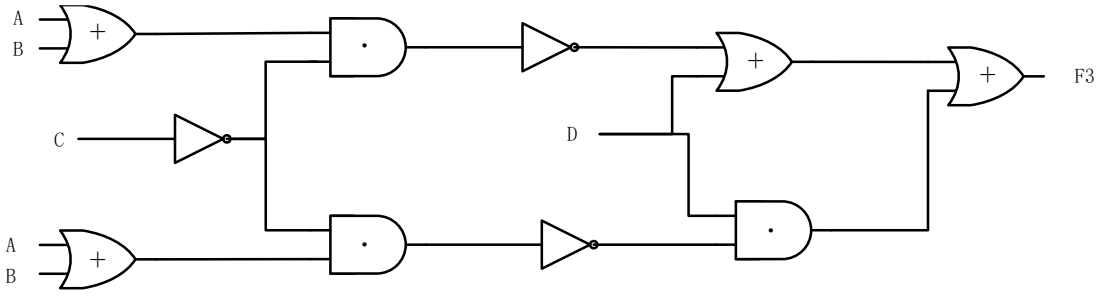
4. For each of the following circuits, find the output and design a simpler circuit that has the same output. (Hint: Find the circuit output by first finding the output of each gate, going from left to right, and simplifying as you go).



(a)



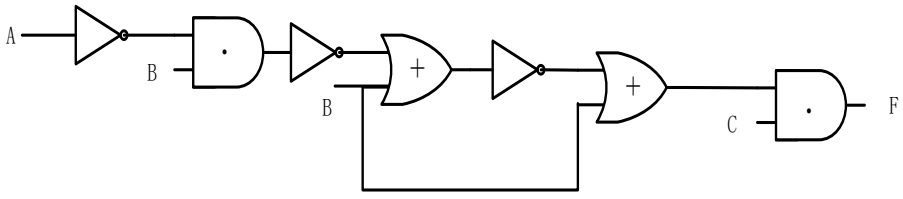
(b)



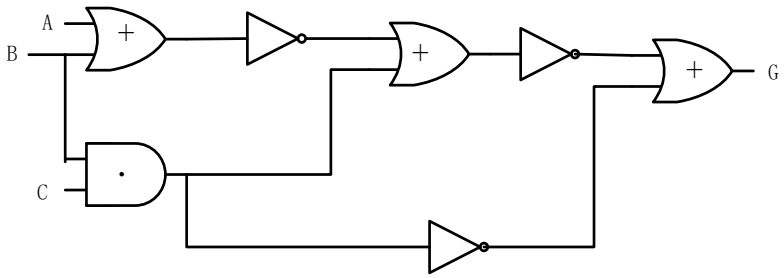
(c)

5. Factor each of the following expressions to obtain a product of sums:
   (a) (ab+c)(b+c'd)
   (b) XY+X'Z
   (c) x'z+wx'y+wyz'+w'y'
   (d) (xy+yz'+x'z)(x+z)

6. Find *F*, *G*, and simplify:



(a)



(b)