HW-1 Due Friday Jan. 16 ECE2030a Name_____

Email _____

Bring this homework to class on Friday Jan. 16, but do not turn it in until the end of class. Note that A' is a notation for NOT(A). The symbol "*" is AND, "+" is OR

#1. Fill in the truth table below for the logic function Out = A+BC

A	B	C	Out
0	0	0	**1**
0	0	1	**0**
0	1	0	**0**
0	1	1	**1**
1	0	0	**1**
1	0	1	**1**
1	1	0	**1**
1	1	1	**1**

#2. Simplify the Boolean expression so that it has only three parameters (out of A, A', B, B', C, C'):

A'C + ABC = _____ (A' + AB)*C _____

= _____(A' + B)*C _____

= _____

#3. Fill in the truth table for the Output of the function in problem #2.

A	B	C	Out
0	0	0	0
0	0	1	1
0	1	0	0
0	1	1	1
1	0	0	0
1	0	1	0
1	1	0	0
1	1	1	1

#4. Using DeMorgan's Theorem, express the function below as indicated.

F(A,B,C) = AC' + A'C' + BC' By chance, (A + A')C' +BC' = C (1 + B) = C'

a. With only OR and Complement operations: __ **(A'+C)' + (A+C)' + (B'+C)'** __

b. With only AND and Complement operations: ____ **((AC')' (A'C')' (BC')')'**___

#5. In order to design a single stage logic circuit, we need to express the logic function so that only single literals are complemented [no complemented parentheses like (A+B)']. Express the following logic functions that way (use DeMorgan's theorem):

(A'+ B)'C + ((D + E')F)' = _____ **AB'C + (D+E')' + F'** _____

= _____ **B'C +D'+E + F'** _____

= _____

= _____

(AB(C + D)')' = _____ **(AB)' + (C+D)** _____

= _____ **A' + B' + C + D** _____

= _____

= _____

= _____