

CSE 260M - Homework 3

Due September 20, 2006

1. Use the schematic editor to create a circuit with a single OR gate, plus input and output terminals. Use the logic simulator to show how the output changes for all input values. Hand in printouts of the schematic and the logic simulation run.

2. Using a truth table, demonstrate that:

$$X'Y + Y'Z + XZ' = XY' + YZ' + X'Z$$

3. Using a truth table, prove DeMorgan's Theorem for three variables: $(XYZ)' = X' + Y' + Z'$.

4. Draw a logic diagram that directly corresponds to each of the expressions shown below.

(a) $AB' + A'C'D' + A'B'D + A'B'CD'$

(b) $B' + A'C'D'$

(c) $(A' + B' + C + D')(A + B + C' + D)$

5. Simplify the following Boolean expressions using only the Boolean theorems in the notes to a minimum number of literals:

$$ABC + ABC' + A'B$$

$$(A + B)'(A' + B')$$

$$(A + B' + AB')(AB + A'C + BC)$$

$$((A + B)C' + AB')B'D$$