

Recitation Material for Week 3  
Tasks to do in the recitation section  
Assigned Date: Second Week

T1. Review HW02 and solve any problems that students point out they had difficulty with.

T2. Answer any general questions about HW03 and Lab 02 that students ask.

T3. Solve the following problems in order until time runs out.

1. Solve problem P8 of HW02.
2. Use algebraic manipulation to find the minimum product-of-sums expression for the function  
 $f = (x_1 + x_2 + x_3) \cdot (x_1 + x_2' + x_3) \cdot (x_1' + x_2' + x_3) \cdot (x_1 + x_2 + x_3')$
3. Use Venn diagram to prove the two forms of DeMorgan's theorem:  
(a)  $(X \cdot Y)' = X' + Y'$  and (b)  $(X + Y)' = X' \cdot Y'$
4. Reduce the expressions below using axioms, theorems, and properties of Boolean algebra. Then, draw the circuit diagram for each of the reduced expressions, and find the cost of each circuit as the sum of the number of gates and the number of gate inputs.  
(a)  $X \cdot Y \cdot (X' \cdot Y + X' \cdot Y')$   
(b)  $X \cdot Y \cdot (Z + Y Z') + Z'$
5. Reduce the following expression to the simplest form.  
(a)  $\Sigma m(1, 2, 3, 4, 5, 6, 7)$   
(b)  $\Pi M(0, 1, 2, 3, 4, 5, 6)$ .