# Lecture 7

# Convert between SOP and POS

SOP -> POS : Use the following properties

P8a. $a(b + c) = ab + ac$

P14a. $ab + a'c = (a + c)(a' + b)$

P8b. $a + bc = (a + b)(a + c)$

POS -> SOP reverse order

# Example

wx’z’ + w’yz + xy’z

# Convert SOP to Sum of Minterms

Two approaches

By developing a truth table

By using P9a. (adjacency) to add variables to a term

To convert POS to product of maxterms, use P9b

a + a’bc’

# Properties

**P9a. $ab + ab' = a$** **P9b. $(a + b)(a + b') = a$**

**P10a. $a + a'b = a + b$** **P10b. $a(a' + b) = ab$**

**P6a. $a + a = a$** **P6b. $aa = a$**

**P8a. $a(b + c) = ab + ac$** **P8b. $a+bc = (a+b)(a+c)$**

**P12a. $a + ab = a$** **P12b. $a(a + b) = a$**

**P13a. $at_1+a't_2 + t_1t_2 = at_1 + a't_2$**

**P13b. $(a + t_1)(a' + t_2)(t_1 + t_2) = (a + t_1)(a'+t_2)$**

**P14a. $ab + a'c = (a + c)(a' + b)$**

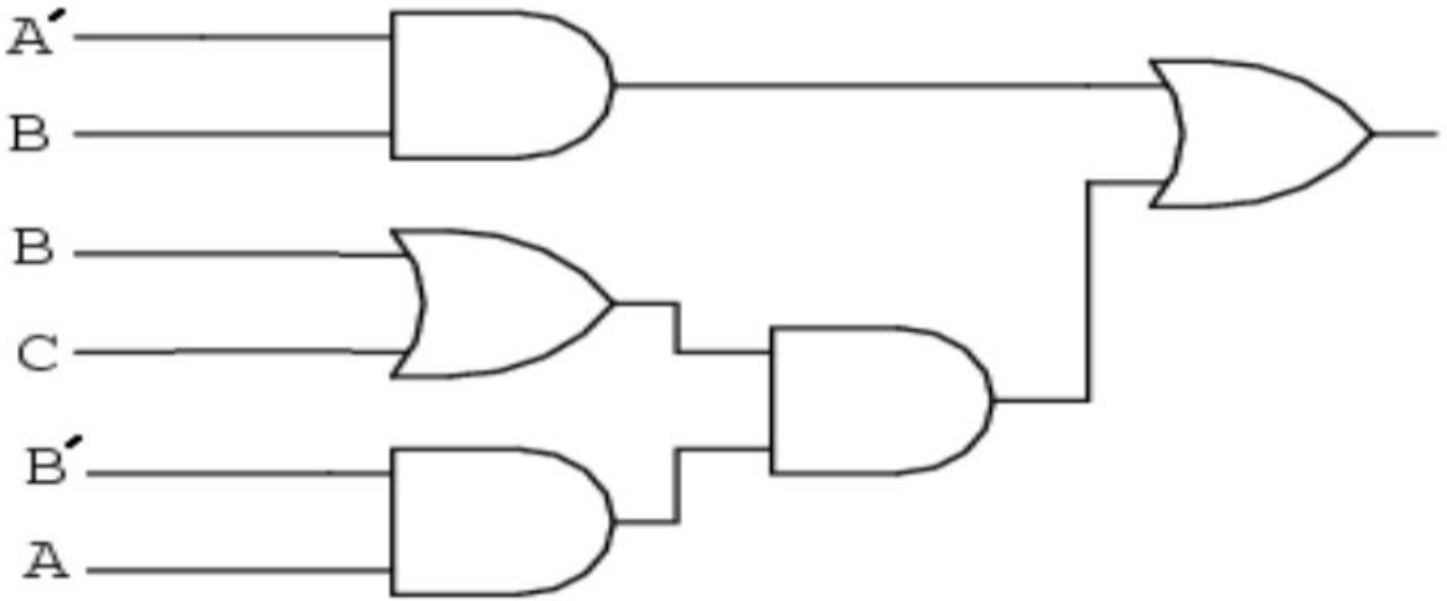
**SOP->POS Properties: P8b, P14a, P8a**

# Ch. 2 finished!

# Quick Review

Draw this:

(a+b’)(a’b) + ac’


A´
B
B
C
B´
A

f(x,y,z) = sum(1,2,6,7)

Show truth table

Show expression

Simplify 3 terms, 7 literals

Simplify this:

a’b’d + ab’d + bc’ + bc’d + ab’c’

3 terms, 6 literals

# Properties

**P9a. $ab + ab' = a$** **P9b. $(a + b)(a + b') = a$**

**P10a. $a + a'b = a + b$** **P10b. $a(a' + b) = ab$**

**P6a. $a + a = a$** **P6b. $aa = a$**

**P8a. $a(b + c) = ab + ac$** **P8b. $a+bc = (a+b)(a+c)$**

**P12a. $a + ab = a$** **P12b. $a(a + b) = a$**

**P13a. $at_1+a't_2 + t_1t_2 = at_1 + a't_2$**

**P13b. $(a + t_1)(a' + t_2)(t_1 + t_2) = (a + t_1)(a'+t_2)$**

**P14a. $ab + a'c = (a + c)(a' + b)$**

**SOP->POS Properties: P8b, P14a, P8a**