Consensus Theorem

This theorem is useful when you have an expression with a complemented variable in 2 terms and a redundant term

$AB + \overline{A}C + BC$

$AB + \overline{A}C + BC(1)$

$AB + \overline{A}C + BC(A+\overline{A})$ (algebraic theorem from our reference chart)

$AB + \overline{A}C + ABC + \overline{A}BC$

$AB + ABC + \overline{A}C + \overline{A}BC$

$AB(1+C) + \overline{A}C(1+B)$

$AB(1) + \overline{A}C(1)$

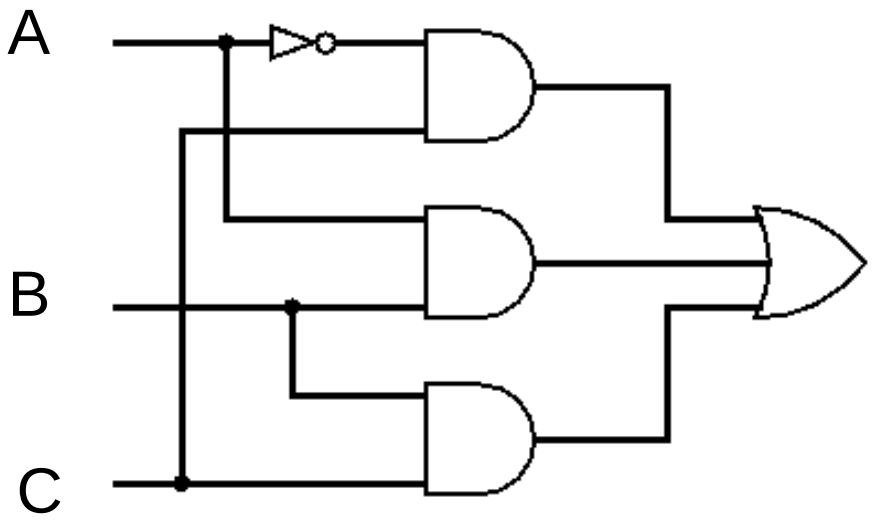
$AB + \overline{A}C$

$AB + \overline{A}C$ (complemented variable is A)

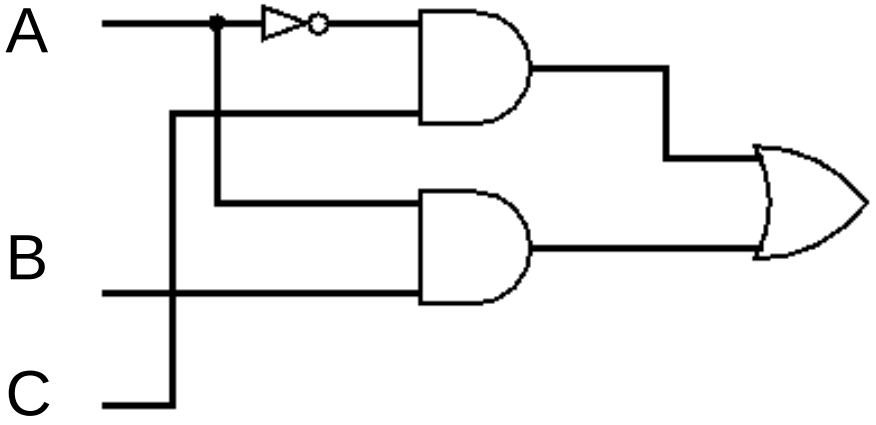
BC (redundant term)

Truth table for this theorem??

Consensus Theorem – AND – OR – NOT



$AB + \overline{A}C + BC$



$AB + \overline{A}C$

Truth table for this theorem??

Consensus Theorem

Another form of the consensus theorem

$(A+B)(\overline{A}+C)(B+C)$

…

…

...

$AC + \overline{A}B$

$(A+B)(\overline{A}+C)$ (complemented variable is A)

$(B+C)$ (redundant term)

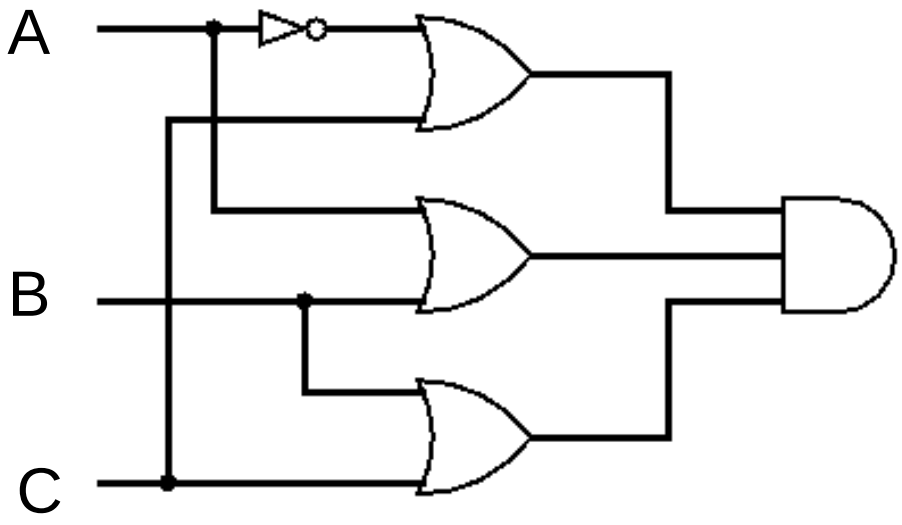
Expand or distribute the 3 terms will result in the following

$AC + \overline{A}B$ can be written as $(A+B)(\overline{A}+C)$…..(multiplying out)

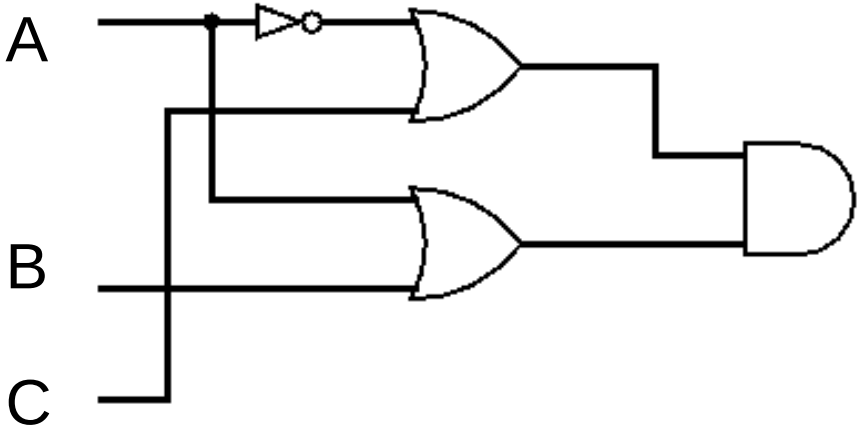
Therefore, $(A+B)(\overline{A}+C)(B+C) = (A+B)(\overline{A}+C)$

Use the truth table to verify this theorem??

Consensus Theorem – AND – OR – NOT



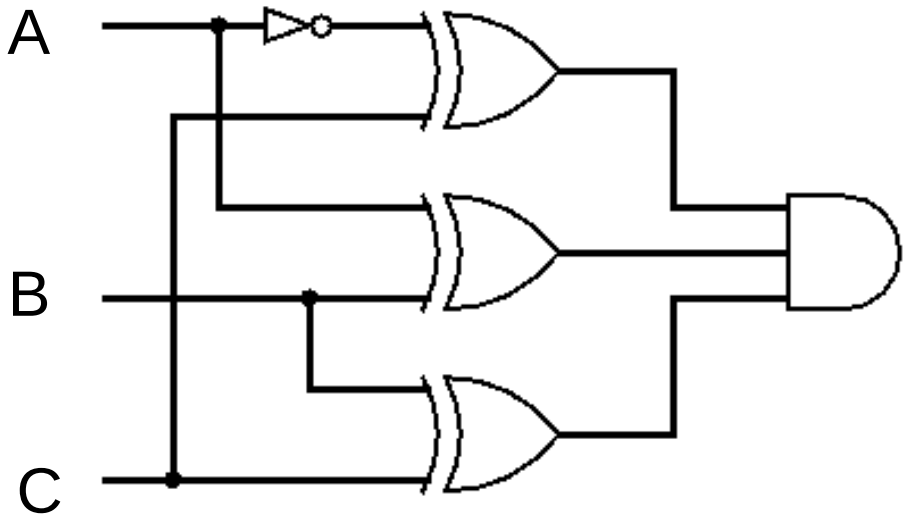
$(A+B)(\overline{A}+C)(B+C)$



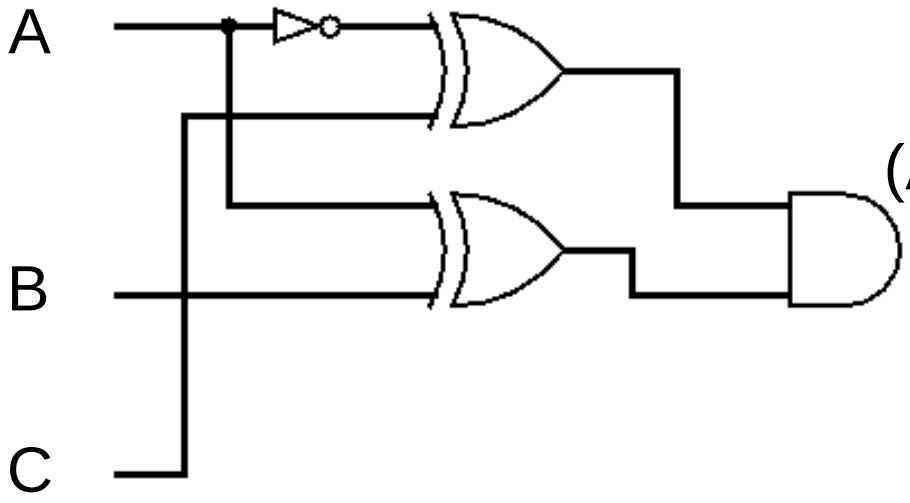
$(A+B)(\overline{A}+C)$

Truth table for this theorem??

Consensus Theorem – XOR – XNOR



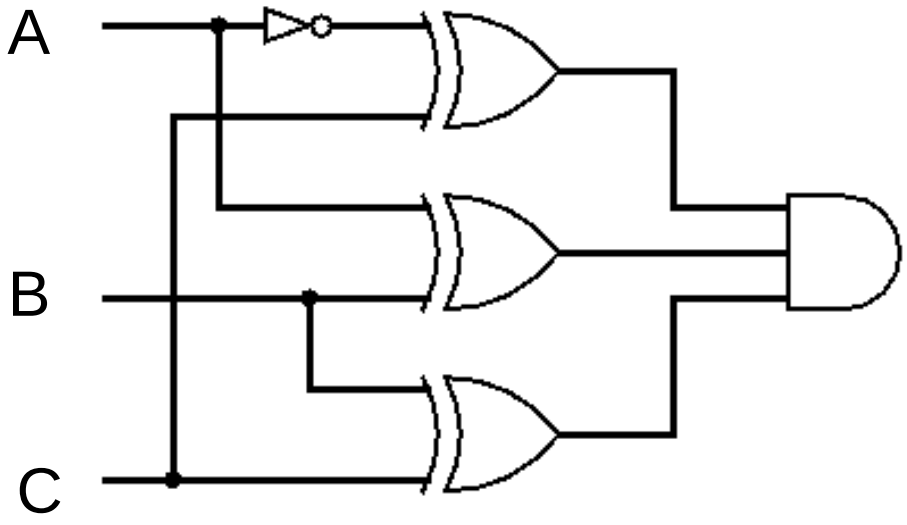
$(A \oplus B)(\overline{A} \oplus C)(B \oplus C)$



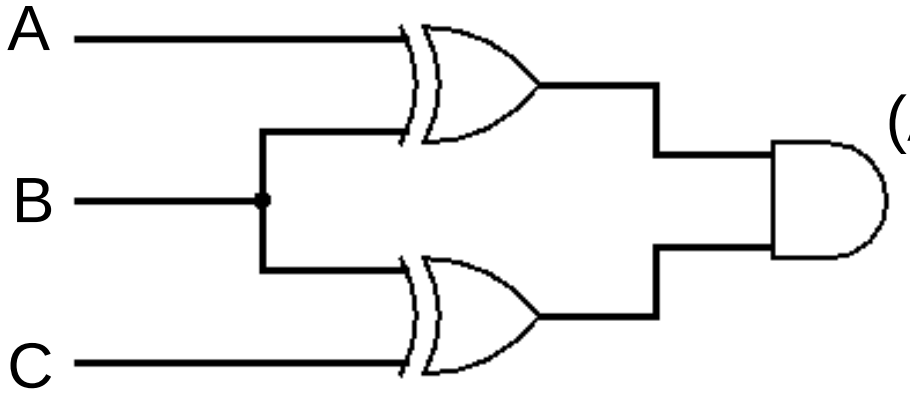
$(A \oplus B)(\overline{A} \oplus C)$

Truth table for this theorem??

Consensus Theorem – XOR – XNOR



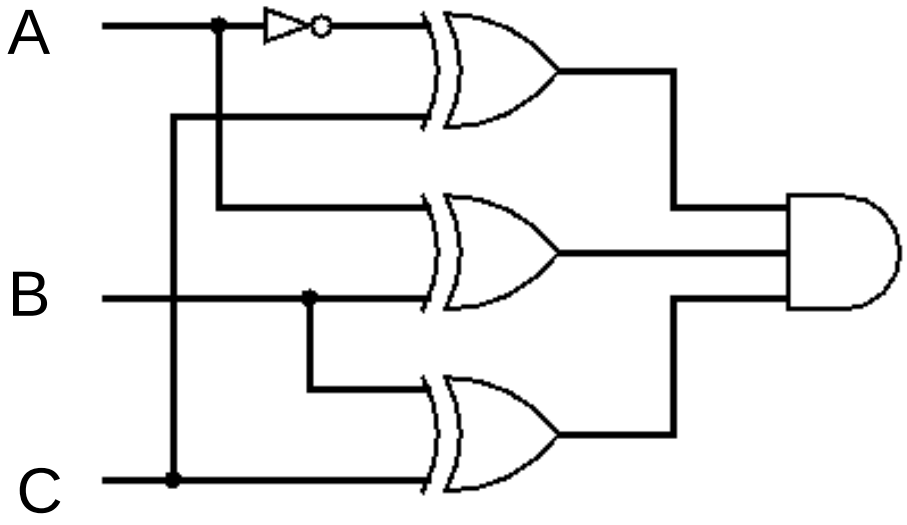
$(A \oplus B)(\overline{A} \oplus C)(B \oplus C)$



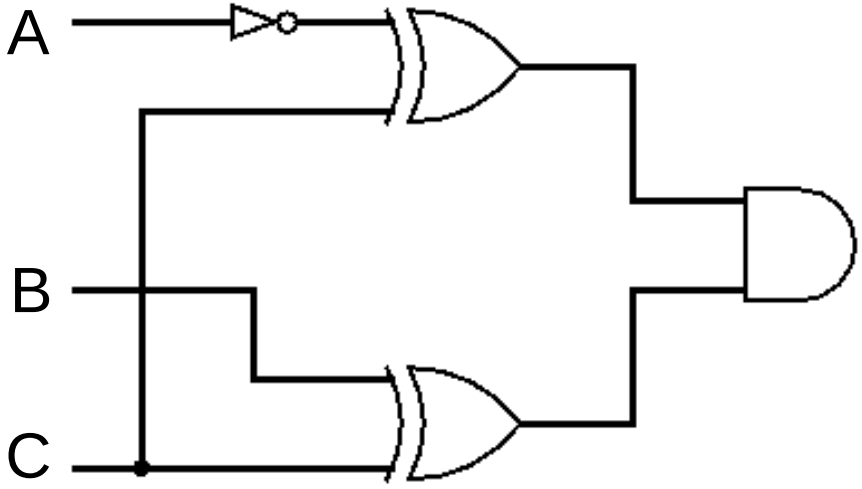
$(A \oplus B)(B \oplus C)$

Truth table for this theorem??

Consensus Theorem – XOR – XNOR



$(A \oplus B)(\overline{A} \oplus C)(B \oplus C)$



$(\overline{A} \oplus C)(B \oplus C)$

Truth table for this theorem??