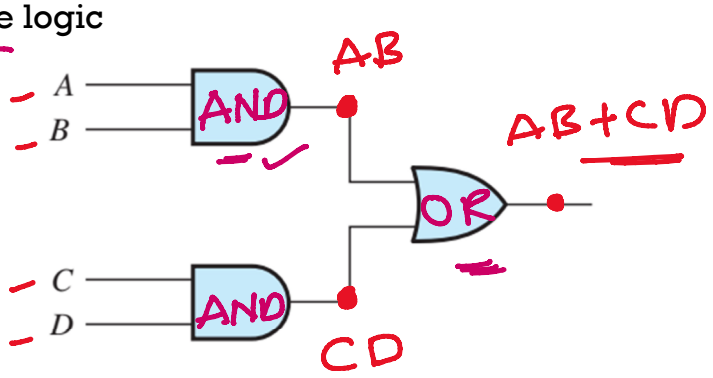
Example 1 Logic Gates

Monday, 24 August, 2020 5:11 PM

- Write a Boolean expression for the output of the logic circuit



AND
OR
NOT

NAND
NOR
XOR

Example 2

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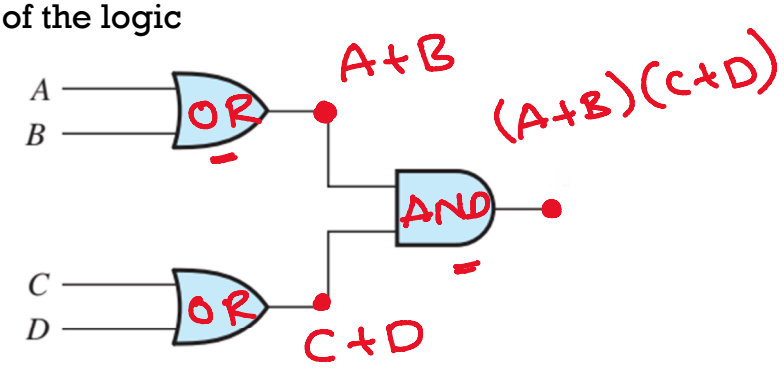
- Write a Boolean expression for the output of the logic circuit



Example 3

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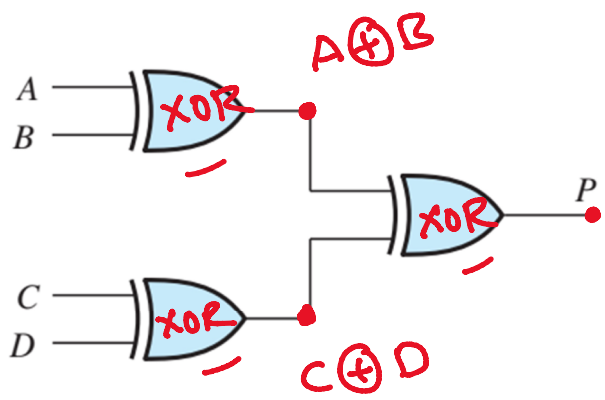
- Write a Boolean expression for the output of the logic circuit



$P = (A \oplus B) \oplus (C \oplus D)$

Example 4

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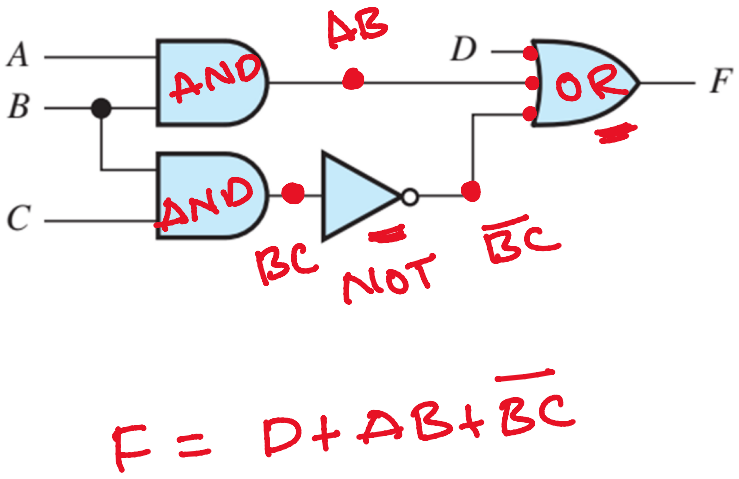
- Write a Boolean expression for the output of the logic circuit



$$F = D + AB + \overline{BC}$$

Example 5

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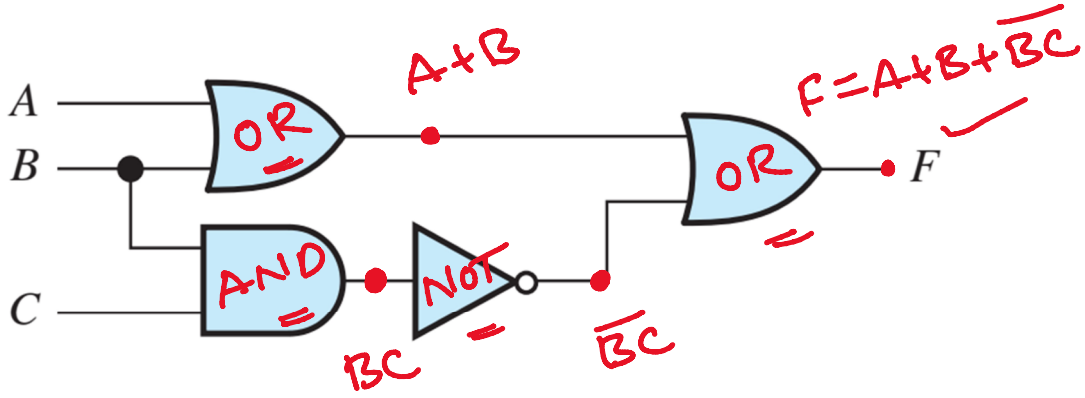
- Write a Boolean expression for the output of the logic circuit
- Also give the truth table for the circuit



Truth table.

$F = A + B + \overline{BC}$

A	B	C	A+B	BC	$\overline{BC}$	$A+B+\overline{BC}$
0	0	0	0	0	1	1
0	0	1	0	0	1	1
0	1	0	1	0	1	1
0	1	1	1	1	0	1
1	0	0	1	0	1	1
1	0	1	1	0	1	1
1	1	0	1	0	1	1
1	1	1	1	1	0	1

Example 6

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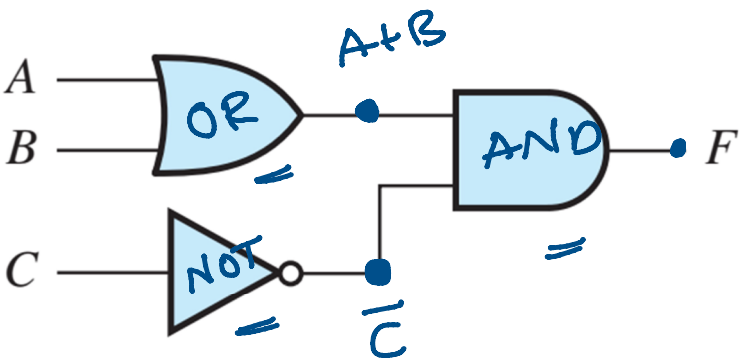
- Write a Boolean expression for the output of the logic circuit
- Also give the truth table for the circuit



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

Truth table.

A	B	C	A+B	$\overline{C}$	$(A+B)\overline{C}$
0	0	0	0	1	0
0	0	1	0	0	0
0	1	0	1	1	1
0	1	1	1	0	0
1	0	0	1	1	1
1	0	1	1	0	0
1	1	0	1	1	1
1	1	1	1	0	0

Example 1 Boolean Algebra

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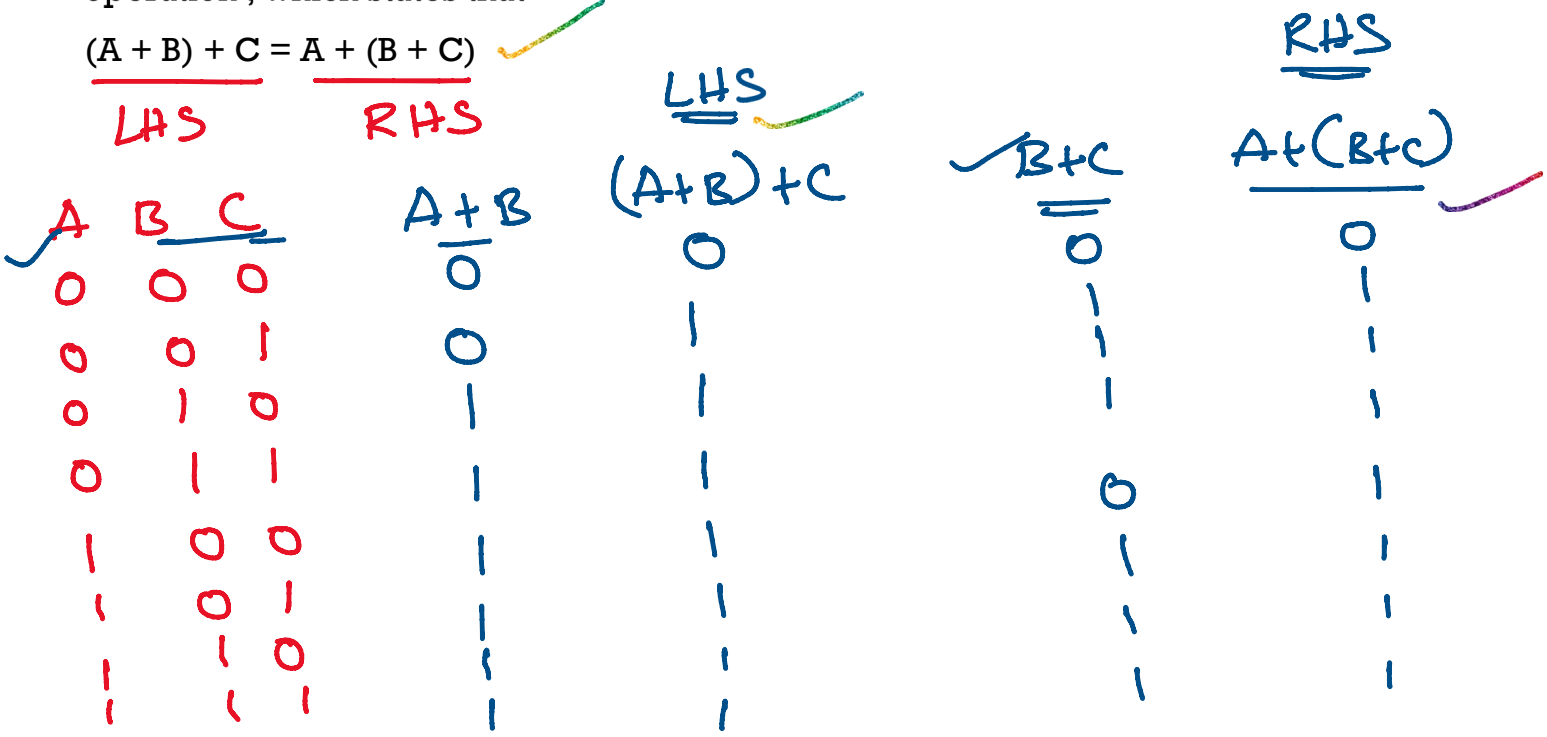
- **Example 1:** Prove the associative law for the OR operation , which states that

$$(A + B) + C = A + (B + C)$$

LHS RHS



Example 2

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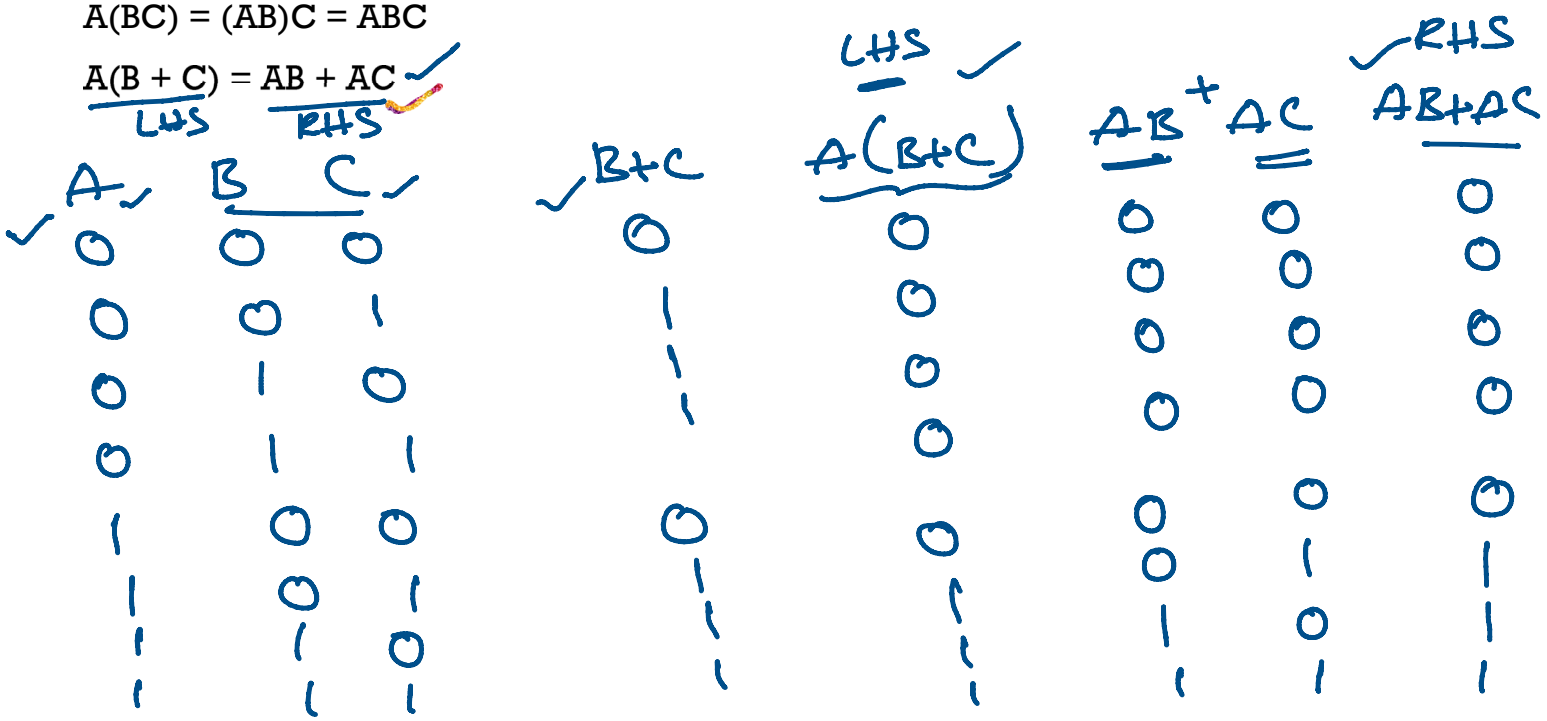
- **Example 2:** Use truth tables to prove the following operations

A(BC) = (AB)C = ABC

A(B + C) = AB + AC

LHS RHS



Example 3

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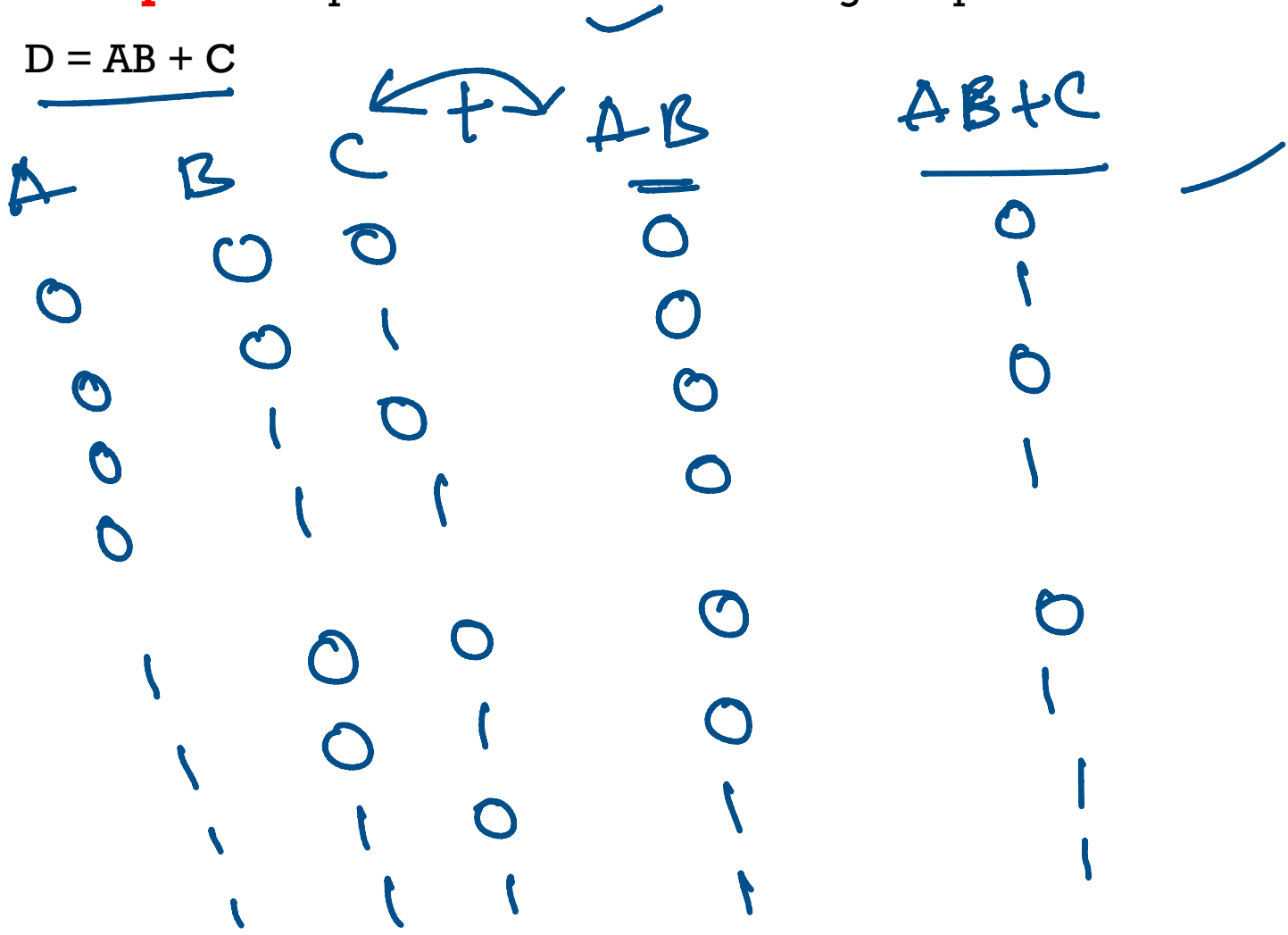
- **Example 3:** Prepare a truth table for the logic expression

  D = AB + C