**BOOLEAN ALGEBRA**

**Boolean algebra** is a division of mathematics that deals with operations on logical values and incorporates binary variables. Boolean algebra traces its origins to an 1854 book by mathematician George Boole.

The distinguishing factor of Boolean algebra is that it deals only with the study of binary variables. Most commonly Boolean variables are presented with the possible values of 1 ("true") or 0 ("false"). Variables can also have more complex interpretations, such as in set theory. Boolean algebra is also known as **binary algebra**.

**BOOLEAN ALGEBRA**

**FUNCTION EVALUATION**

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**BOOLEAN ALGEBRA**

**BASIC IDENTITIES**

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**BOOLEAN ALGEBRA**

**DUALITY PRINCIPLE**

**Duality principle:**

**•** States that a Boolean equation remains valid if we take the dual of the expressions on both sides of the equals sign.

• The dual can be found by interchanging the **AND** and **OR** operators along with also interchanging the **0’s** and **1’s.**

• This is evident with the duals in the basic identities.

• For instance: DeMorgan’s Law can be expressed in two forms

**(X+ Y)′= X′Y′**

**(XY)′= X′ + Y′**

**BOOLEAN ALGEBRA**

**FUNCTION MANIPULATION**

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