Boolean Algebra Laws and Rules

Commutative Law of Addition and Multiplication

- The order of *OR*ing or *AND*ing does not matter:

  A + B = B + A

  AB = BA

Associative Law of Addition and Multiplication

- The grouping of several variables of *OR*ed or *AND*ed does not matter:

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

  A(BC) = (AB)C

Distributive Law of Addition and Multiplication

- **Method for expanding an equation containing *OR*s and *AND*s:**

  A(B + C) = AB + AC

  (A + B)(C + D) = AC + AD + BC + BD

Rule #1

- **Anything *AND*ed with a 0 is equal to 0:**

   A • 0 = 0

Rule #2

- **Anything *AND*ed with a 1 is equal to itself:**

  A • 1 = A

Rule #3

- **Anything *OR*ed with a 0 is equal to itself:**

  A + 0 = A

Rule #4

- **Anything *OR*ed with a 1 is equal to 1:**

  A + 1 = 1

Rule #5

- **Anything *AND*ed with itself is equal to itself:**

  A • A = A

Rule #6

- **Anything *OR*ed with itself is equal to itself:**

  A + A = A

Rule #7

- **Anything *AND*ed with its own compliment is equal to 0:**

  A • A' = 0

Rule #8

- **Anything *OR*ed with its own compliment is equal to 1:**

  A + A' = 1

Rule #9

- **A variable complimented twice will return to its original logic level:**

  A" = A

Rule #10

- A + A'B = A + B
- A' + AB = A'+ B