BOOLEAN ALGEBRA

Axioms of Boolean Algebra

1a. $0 \cdot 0 = 0$
1b. $1 + 1 = 1$
2a. $1 \cdot 1 = 1$
2b. $0 + 0 = 0$
3a. $0 \cdot 1 = 1 \cdot 0 = 0$
3b. $1 + 0 = 0 + 1 = 1$
4a. If $x = 0$, then $\overline{x} = 1$
4b. If $x = 1$, then $\overline{x} = 0$

Single-Variable Theorems

5a. $x \cdot 0 = 0$
5b. $x + 1 = 1$
6a. $x \cdot 1 = x$
6b. $x + 0 = x$
7a. $x \cdot x = x$
7b. $x + x = x$
8a. $x \cdot \overline{x} = 0$
8b. $x + \overline{x} = 1$
9. $\overline{\overline{x}} = x$

Two- and Three-Variable Properties

10a.	$x \cdot y = y \cdot x$	*Commutative*
10b.	$x + y = y + x$	
11a.	$x \cdot (y \cdot z) = (x \cdot y) \cdot z$	*Associative*
11b.	$x + (y + z) = (x + y) + z$	
12a.	$x \cdot (y + z) = x \cdot y + x \cdot z$	*Distributive*
12b.	$x + y \cdot z = (x + y) \cdot (x + z)$	
13a.	$x + x \cdot y = x$	*Absorption*
13b.	$x \cdot (x + y) = x$	
14a.	$x \cdot y + x \cdot \overline{y} = x$	*Combining*
14b.	$(x + y) \cdot (x + \overline{y}) = x$	
15a.	$\overline{x \cdot y} = \overline{x} + \overline{y}$	*DeMorgan's theorem*
15b.	$\overline{x + y} = \overline{x} \cdot \overline{y}$	
16a.	$x + \overline{x} \cdot y = x + y$	
16b.	$x \cdot (\overline{x} + y) = x \cdot y$	
17a.	$x \cdot y + y \cdot z + \overline{x} \cdot z = x \cdot y + \overline{x} \cdot z$	*Consensus*
17b.	$(x + y) \cdot (y + z) \cdot (\overline{x} + z) = (x + y) \cdot (\overline{x} + z)$	