Boolean algebra reference sheet

Matthew T. Ireland, October MMXIV

Let A, B, C and D be Boolean variables. Let . denote logical AND, $+$ denote logical OR, and $\oplus$ denote logical EXCLUSIVE OR.

Truth tables

A	$\overline{A}$
0	1
1	0

A	B	$A.B$
0	0	0
0	1	0
1	0	0
1	1	1

A	B	$A+B$
0	0	0
0	1	1
1	0	1
1	1	1

A	B	$A \oplus B$
0	0	0
0	1	1
1	0	1
1	1	0

Logical identities

Commutativity	$A+B \equiv B+A$		$A.B \equiv B.A$	
Associativity	$A+(B+C) \equiv (A+B)+C$		$A.(B.C) \equiv (A.B).C$	
Properties of .	$0.A \equiv 0$	$1.A \equiv A$	$A.A \equiv A$	$A.\overline{A} \equiv 0$
Properties of $+$	$0+A \equiv A$	$1+A \equiv 1$	$A+A \equiv A$	$A+\overline{A} \equiv 1$
Double inversion law	$\overline{\overline{A}} \equiv A$			
Distributive laws	$A.(B+C+\ldots) \equiv A.B+A.C+\ldots$			
	$A+(B.C.\ldots) \equiv (A+B).(A+C).\ldots$			
Product laws	$(A+B).(A+B) \equiv A.A+A.B+B.A+B.B$			
	$A+(B.C) \equiv (A+B).(A+C)$			
Absorption laws	$A+A.B \equiv A$		$A.(A+C) \equiv A$	
Redundancy law	$A.B+A.B.C+A.B.D \equiv A.B$			
De Morgan's laws	$\overline{A+B} \equiv \overline{A}.\overline{B}$		$\overline{A.B} \equiv \overline{A}+\overline{B}$	