Boolean Algebra

Electrical Engineering

The identities that shrink an expression before a Karnaugh map is even drawn.

Ten laws, and one of them has no arithmetic counterpart.

Identities

$A + 0 = A$ and $A \cdot 1 = A$

$A + 1 = 1$ and $A \cdot 0 = 0$

$A + A = A$ and $A \cdot A = A$

$A + A' = 1$ and $A \cdot A' = 0$

$(A')' = A$

Structural laws

Commutative: $A + B = B + A$

Associative: regroup terms freely

Distributive: $A(B + C) = AB + AC$

Absorption: $A + AB = A$

Consensus: $AB + A'C + BC = AB + A'C$

Distribution works both ways here: $A + BC = (A + B)(A + C)$. Ordinary arithmetic has no equivalent, which is why it looks wrong.