

Boolean Algebra Laws and Identities

Fundamental Laws

$$\begin{array}{lll} \text{OR} & \text{AND} & \text{NOT} \\ A + 0 = A & A \cdot 0 = 0 & \\ A + 1 = 1 & A \cdot 1 = A & \\ A + A = A & A \cdot A = A & \overline{\overline{A}} = A \\ A + \overline{A} = 1 & A \cdot \overline{A} = 0 & \end{array} \quad (6.10)$$

Commutative Laws

$$A + B = B + A \quad (6.11)$$

$$A \cdot B = B \cdot A \quad (6.12)$$

Associative Laws

$$(A + B) + C = A + (B + C) \quad (6.13)$$

$$(A \cdot B) \cdot C = A \cdot (B \cdot C) \quad (6.14)$$

Distributive Laws

$$A \cdot (B + C) = (A \cdot B) + (A \cdot C) \quad (6.15)$$

$$A + (B \cdot C) = (A + B) \cdot (A + C) \quad (6.16)$$

De Morgan's Laws

$$\overline{A + B + C + \dots} = \overline{A} \cdot \overline{B} \cdot \overline{C} \cdot \dots \quad (6.27)$$

$$\overline{A \cdot B \cdot C \cdot \dots} = \overline{A} + \overline{B} + \overline{C} + \dots \quad (6.28)$$