

Logical Equivalences Reference Sheet

Identity

$$A \wedge T \equiv A$$

$$A \vee F \equiv A$$

Domination

$$A \vee T \equiv T$$

$$A \wedge F \equiv F$$

Idempotency

$$A \vee A \equiv A$$

$$A \wedge A \equiv A$$

Commutativity

$$A \vee B \equiv B \vee A$$

$$A \wedge B \equiv B \wedge A$$

Associativity

$$(A \vee B) \vee C \equiv A \vee (B \vee C)$$

$$(A \wedge B) \wedge C \equiv A \wedge (B \wedge C)$$

Distributivity

$$A \wedge (B \vee C) \equiv (A \wedge B) \vee (A \wedge C)$$

$$A \vee (B \wedge C) \equiv (A \vee B) \wedge (A \vee C)$$

Absorption

$$A \vee (A \wedge B) \equiv A$$

$$A \wedge (A \vee B) \equiv A$$

Negation

$$A \vee \neg A \equiv T$$

$$A \wedge \neg A \equiv F$$

DeMorgan's Laws

$$\neg(A \vee B) \equiv \neg A \wedge \neg B$$

$$\neg(A \wedge B) \equiv \neg A \vee \neg B$$

Double Negation

$$\neg\neg A \equiv A$$

Law of Implication

$$A \rightarrow B \equiv \neg A \vee B$$

Contrapositive

$$A \rightarrow B \equiv \neg B \rightarrow \neg A$$