

# Logical Equivalences

Equivalence	Name	Description
$p \wedge T \equiv p$ $p \vee F \equiv p$	Identity Laws	Focus on removing unnecessary/repetitive values
$p \vee T \equiv T$ $p \wedge F \equiv F$	Domination Laws	Focus on reducing to a final result
$p \vee p \equiv p$ $p \wedge p \equiv p$	Idempotent Laws	Focus on removing unnecessary/repetitive propositions
$\neg(\neg p) \equiv p$	Double Negation Law	Focus on removing NOTs
$p \vee q \equiv q \vee p$ $p \wedge q \equiv q \wedge p$	Commutative Laws	Focus on moving propositions around, creating an easier expression to work with
$(p \vee q) \vee r \equiv p \vee (q \vee r)$ $(p \wedge q) \wedge r \equiv p \wedge (q \wedge r)$	Associative Laws	Focus on moving propositions around, creating an easier expression to work with
$p \vee (q \wedge r) \equiv (p \vee q) \wedge (p \vee r)$ $p \wedge (q \vee r) \equiv (p \wedge q) \vee (p \wedge r)$	Distributive Laws	Focus on Distributing ANDs & ORs
$\neg(p \wedge q) \equiv \neg p \vee \neg q$ $\neg(p \vee q) \equiv \neg p \wedge \neg q$	De Morgan's Laws	Focus on distributing NOTs and needing to flip ANDs & ORs
$p \vee (p \wedge q) \equiv p$ $p \wedge (p \vee q) \equiv p$	Absorption	Focus on removing propositions

## Other Useful Logical Equivalences

$$p \vee \neg p \equiv T$$

$$p \wedge \neg p \equiv F$$

$$(p \rightarrow q) \equiv (\neg p \vee q)$$