LOGICAL IDENTITIES

$P \equiv P \wedge P$ $P \equiv P \vee P$	**idempotence of $\wedge$** **idempotence of $\vee$**
$P \vee Q \equiv Q \vee P$ $P \wedge Q \equiv Q \wedge P$	**commutativity of $\vee$** **commutativity of $\wedge$**
$(P \vee Q) \vee R \equiv P \vee (Q \vee R)$ $(P \wedge Q) \wedge R \equiv P \wedge (Q \wedge R)$	**associativity of $\vee$** **associativity of $\wedge$**
$\neg(P \vee Q) \equiv \neg P \wedge \neg Q$ $\neg(P \wedge Q) \equiv \neg P \vee \neg Q$	**DeMorgan's Laws**
$P \wedge (Q \vee R) \equiv (P \wedge Q) \vee (P \wedge R)$ $P \vee (Q \wedge R) \equiv (P \vee Q) \wedge (P \vee R)$	**distributivity of $\wedge$ over $\vee$** **distributivity of $\vee$ over $\wedge$**
$P \vee T \equiv T$ $P \wedge F \equiv F$	**domination laws**
$P \wedge T \equiv P$ $P \vee F \equiv P$	**identity laws**
$P \vee \neg P \equiv T$ $P \wedge \neg P \equiv F$	**negation laws**
$\neg(\neg P) \equiv P$	**double negation law**
$P \vee (P \wedge Q) \equiv P$ $P \wedge (P \vee Q) \equiv P$	**absorption laws**
$P \to Q \equiv \neg P \vee Q$	**implication**
$P \to Q \equiv \neg Q \to \neg P$	**contrapositive**
$P \leftrightarrow Q \equiv [(P \to Q) \wedge (Q \to P)]$ $P \leftrightarrow Q \equiv (P \wedge Q) \vee (\neg P \wedge \neg Q)$	**equivalence**
$[(P \wedge Q) \to R] \equiv [P \to (Q \to R)]$	**exportation**