

A statement form is any sequence of symbols containing statement variables but no statements such that statements are substituted for the statement variables - the result is a statement.

Example: $p \vee q$, $p \wedge q$, $p > q$, ~~$p < q$~~

\bar{p}

1. Tautologous, 2. Contradictory, and 3. contingent.

1. A statement form that has only true substitution instances is called a tautologous statement or a tautology. ex. $p \vee \bar{p}$

2. A statement form that has only false substitution instances is said to be self-contradictory or contradiction and is logically false. ex. $\bar{p} \wedge p$

3. Statement forms that have both true and false statements among their substitution instances are called contingent statement forms. ex. p , \bar{p} , $p \wedge q$, $p \vee q$, $p > q$

Material Equivalence

$$p \equiv q \equiv (\text{tribar})$$

Material equivalence is a truth-functional connective, just as disjunction and material implication are truth-functional connectives.

Two statements that are equivalent in truth value, are therefore materially equivalent.

$$1. (p \supset q) \equiv (\sim q \supset \sim p)$$

$$2. (p \supset q) \equiv (\sim p \supset \sim q)$$

$$3. p \equiv [p \cdot (q \vee \sim q)]$$

$$4. p \equiv [p \vee (q \vee \sim q)]$$

Logical Equivalence (not a ~~connective~~ connective)

$$p \equiv \sim \sim p$$

$$\sim(p \vee q) \equiv (\sim p \cdot \sim q)$$