p	q	Negation ~p	Conjunction $p \wedge q$	Disjunction $p \vee q$	Conditional $p \rightarrow q$	Biconditional $p \leftrightarrow q$
T	T	F	T	T	T	T
T	F	F	F	T	F	F
F	T	T	F	T	T	F
F	F	T	F	F	T	T
		Opposite truth values from p	True only when both component statements are true	False only when both component statements are false	False only when the antecedent is true and the consequent is false	True only when the component statements have the same truth value

Example 1: Let p and q represent the following statements:
p: 3 + 5 = 8
q: 2 × 7 = 20

Determine the truth value for each statement.

a. $p \wedge q$ b. $p \wedge \sim q$ c. $\sim p \vee q$ d. $\sim p \vee \sim q$

A **truth table** for a compound statement shows when the statement is true and when it is false. The first few columns show the simple statements that comprise the compound statement and their possible truth values. The final column heading is the given compound statement. The truth values in each column are determined by looking back at appropriate columns and using one of the five definitions of symbolic logic.

If a compound statement is always true, is called a **tautology**.

Example 2: Construct a truth table for $\sim(p \vee q)$ to determine when the statement is true and when the statement is false.