Rules of Logic

The following material on logic is gleaned from Chapter 1, <u>Mathematics: A Topical Approach</u> by Bumby & Klutch, 1982, Charles E. Merrell Publishing Company, Columbus, Ohio.

Candidates for political office often appear to have differing ideas of what is logical. They can use the same information to arrive at very different conclusions. Regardless of the environment or application, proper ground rules of logic should be used in reaching a conclusion.

1.	A statement, also called an assertion, is any sentence which is true or false; but not both. The truth or falsity of a statement is called its "truth value."

2.	Placeholders in mathematical sentences are called variables. An open sentence contains one or more placeholders. Variables are selected from a collection of possibilities called the domain and the collection of all variables from the domain which make an open sentence true is called the solution set.

3.	If a statement is represented by "p", then "not p" is the negation of that statement. A negation of a negation is same as the original. That is, "p" equals "not (not p)".

4.	A compound statement formed by joining two statements with the word "and" is called a conjunction. Each of the statements is called a conjunct.

5.	A compound statement formed by joining two statements with the word "or" is called a disjunction. Each statement is called a disjoint.

6.	A compound statement formed by joining two statements with the words "if...then" is called a conditional.

7.	In logic, the symbol " $\rightarrow$ " is used to represent a conditional. Therefore, the conditional if p then q can be written as "p $\rightarrow$ q". Statement p is called the antecedent of the conditional and the statement q is called the consequent.