

Conditional Statements

Definition 1: If-Then Statements: An if-then statement is just what the name says it is. It is a statement that proves *if* something happens *then* something else will happen.

If D is between C and E, then $CD + DE = CE$

Example 1 Identify the hypothesis and conclusion for “If a triangle has a right angle, then it is a right triangle.”

Conditional: If a triangle has a right angle, then it is a right triangle

Assumption: A triangle has a right angle

Result: It is a right triangle

These kinds of if-then statements are called **conditional statements**, or just **conditionals**.

Definition 2: **Conditional Statement** is a statement with "if-then" structure; it has an "if" clause and a "then" clause.

Conditional statements have two parts. One part can begin with if, and the other part can begin with then. The part following if in a conditional statement is called the **hypothesis**; or the assumed part. The part following then in a conditional statement is called the **conclusion**; or the result.

To symbolize an if-then statement, let **p** represents the hypothesis, and **q** represents the conclusion.

If **p**, then **q**.

Example 2: Statement: “If Sami lived in California, then he lives east of the capital of the USA”

Converse: “If Sami lives east of the capital of the USA, then he lives in California”

Conditional statements are not always written with the ‘if’ clause first. For example,

General Form

If **p**, then **q**

p implies **q**

p only if **q**

q if **p**

Example

If $x^2 = 4$, then $x = 2$

$x^2 = 4$ implies $x = 2$

$x^2 = 4$ only if $x = 2$

$x = 2$ if $x^2 = 4$