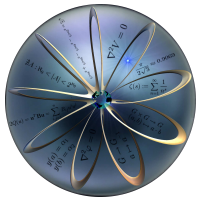

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converse

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Defines	conversely

Let a statement be of the form of an implication

$$\text{If } p \text{ then } q$$

http://planetmath.org/Iei.e. it has a certain premise p and a conclusion q. The statement in which one has interchanged the conclusion and the premise,

$$\text{If } q \text{ then } p$$

is the *converse* of the first. In other words, from the former one concludes that q is necessary for p, and from the latter that p is necessary for q.

Note that the converse of an implication and the inverse of the same implication are contrapositives of each other and thus are logically equivalent.

If there is originally a statement which is a (true) theorem and if its converse also is true, then the latter can be called the *converse theorem* of the original one. Note that, if the converse of a true theorem "If p then q" is also true, then "p iff q" is a true theorem.

For example, we know the theorem on isosceles triangles:

If a triangle contains two ***http://planetmath.org/Congruent2****congruent sides, then it has two congruent angles.*

There is also its converse theorem:

If a triangle contains two congruent angles, then it has two congruent sides.

Both of these propositions are true, thus being theorems (see the entries angles of an isosceles triangle and determining from angles that a triangle is isosceles). But there are many (true) theorems whose converses are not true, http://planetmath.org/Ege.g.:

If a function is differentiable on an interval I, then it is ***http://planetmath.org/ContinuousF*** *on I.*