contradiction

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Defines	proof by contradiction
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A *contradiction* occurs when the statements p and $\neg p$ are shown to be true simultaneously. This concept appears most often in a *proof by contradiction* (also known as *reductio ad absurdum*), which is proving a statement by supposing its negation is true and logically deducing an absurd statement. That is, in attempting to prove q, one may assume $\neg q$ and attempt to obtain a statement of the form $\neg r$, where r is a statement that is assumed or known to be true.

Proofs by contradiction can become confusing. This is especially the case when such proofs are nested; `http://planetmath.org/Iei`.e., a proof by contradiction occurs within a proof by contradiction. Some mathematicians prefer to use a direct proof whenever possible, as such are easier to follow in general. A small minority of mathematicians go so far as to reject proof by contradiction as a valid proof technique. It should be pointed out that something good can be said for proof by contradiction: If one wants to prove a statement of the form $p \implies q$, using the technique of proof by contradiction gives an additional hypothesis with which to work.