

# Using the `amsthm` Package

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## 1 Introduction

The `amsthm` package provides an enhanced version of L<sup>A</sup>T<sub>E</sub>X's `\newtheorem` command for defining theorem-like environments. The enhanced `\newtheorem` recognizes a `\theoremstyle` specification (as in Mittelbach's `theorem` package) and has a `*` form for defining unnumbered environments. The `amsthm` package also defines a `proof` environment that automatically adds a QED symbol at the end. AMS document classes incorporate the `amsthm` package, so everything described here applies to them as well.

If the `amsthm` package is used with a non-AMS document class and with the `amsmath` package, `amsthm` must be loaded *after* `amsmath`, not before.

Examples are given in the file `thmtest.tex`. For best understanding, examine the output side-by-side with the input.

## 2 The `\newtheorem` command

In mathematical research articles and books, theorems and proofs are among the most common elements, but authors also use many others that fall in the same general class: lemmas, propositions, axioms, corollaries, conjectures, definitions, remarks, cases, steps, and so forth. It is natural to handle these elements as L<sup>A</sup>T<sub>E</sub>X environments, but document classes do not provide predefined environments for theorem-like elements because (a) that would make it difficult for authors to exercise the necessary control over the automatic numbering, and (b) the variety of such elements is so wide that it's not possible for a document class to provide every one that will ever be needed. Instead there is a command `\newtheorem`, similar in effect to `\newenvironment`, that makes it easy for authors to set up the elements required for a particular document.

The `\newtheorem` command has two mandatory arguments; the first one is the environment name that the author would like to use for this element; the second one is the heading text. For example,

```
\newtheorem{lem}{Lemma}
```

means that instances in the document of

```
\begin{lem} Text text ... \end{lem}
```