Contents

[1] The printed version of this document contains sample papers and related source code for journals, proceedings, and monographs. The electronic version of these instructions does not include sample papers.

INSTRUCTIONS FOR PREPARATION OF PAPERS AND MONOGRAPHS: $\mathcal{A}\mathcal{M}\mathcal{S}$-LaTeX

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1. Introduction

These instructions are intended for preparing articles and books, using LaTeX, for publication with the American Mathematical Society (AMS). They describe the use of LaTeX 'document classes' provided by the AMS, which produce output that matches AMS publication style specifications. (Note: if you have an old version of LaTeX—version 2.09 or earlier, or dated earlier than December 1994—some of the features described here will not work; upgrading to current LaTeX is recommended.)

The AMS produces three major types of publications, journals (both print and electronic-only), proceedings volumes, and monographs. There is a generic AMS document class for each of these publication types.

- `gen-j` for journal articles (uses `amsart`)
- `gen-p` for proceedings volumes (uses `amsproc`)
- `gen-m` for monographs (uses `amsbook`)

These document classes can be used for the initial stages of document preparation. When the AMS publication in which a document is to appear becomes known, a publication-specific document class should be substituted for the generic document class. For example, for a submission to the *Contemporary Mathematics* proceedings series, update the `\documentclass` statement to read

```
\documentclass{conm-p-l}
```

Each publication-specific document class is based on one of the three generic classes.

You should read the *AMS Author Handbook* [AH]. It contains guidelines for preparing and submitting electronic manuscripts and camera-ready submissions. An electronic version of the *AMS Author Handbook* is included in each AMS author package. Printed copies are available through the AMS Customer Services Department free of charge.

Each author package contains an electronic version of these instructions, class files, sample documents, a `READ*.ME` file which contains information about each of the files in the package, and the *AMS Author Handbook*.

The instructions that follow address preparation for both electronic manuscripts and camera-ready electronic submissions (see *AMS Author Handbook* for definitions).

It is assumed that the reader is familiar with $\mathcal{A}\mathcal{M}\mathcal{S}$-LaTeX and has access to the items listed in the reference section, especially the LaTeX manual [LM] and the $\mathcal{A}\mathcal{M}\mathcal{S}$-LaTeX User's Guide [ALG].

2. General guidelines

Authors should refer to the *Checklist for Electronic Submissions* section of the *AMS Author Handbook* before preparing their electronic submission. The checklist contains information that is crucial to creating a submission that the AMS will be able to process. If a submission cannot be processed at the AMS, staff will notify the author that a corrected submission is needed. Authors of electronic manuscripts may have the option of having the paper rekeyboarded at the AMS if they do not wish to correct unusable files. Authors of camera-ready material will need to submit new DVI (and/or PostScript files) and LaTeX source files.

Starting a new $\mathcal{A}\mathcal{M}\mathcal{S}$-LaTeX article. Individual articles are generally made up of the following:

- `\documentclass`
- preamble (for document-specific customizations)
- `\begin{document}`
- top matter information
- `\maketitle` (to set the top matter)
- article body
- `\end{document}`

3. Top matter

The top matter associated with a paper includes information that would appear in a bibliographic reference to the paper, plus additional information about the author(s), subject classifications, key words, and acknowledgments of support.

Summary of tags and elements. Table 1 lists the top matter tags provided by the `amsart` and `amsproc` document classes for $\mathcal{A}\mathcal{M}\mathcal{S}$-LaTeX version 1.2. Not every tag is necessary for each paper. Table 1 shows which tags are necessary and which are optional. Requirements for monographs are somewhat different and are described later. Subsequent examples will refer to either the *Contemporary Mathematics* monograph or proceedings series (document classes `conm-m` or `conm-p`). The actual document class name for your document will vary depending on which publication it is submitted to.

The preamble. The area between the `\documentclass` statement and the line `\begin{document}` is referred to as the "preamble". If you define any new commands in the paper, place the definitions in the preamble. Similarly, instructions to access fonts that are not already defined in $\mathcal{A}\mathcal{M}\mathcal{S}$-LaTeX, such as a new math alphabet (see [ALG]), belong here. Placing these general instructions at the very beginning of a paper will make them available throughout the entire paper. In addition, this placement will also make it easier for the production staff to find and check them for compatibility when the paper is combined with others to produce the complete publication.

The AMS document classes automatically load the `amsmath` package; it is not necessary to specify it explicitly. Available `\documentclass` options are described in the file `amsclass.dtx`; process this file with LaTeX to obtain a version with human-readable documentation.

When defining new control sequences, always use `\newcommand`; this will let you know if the name you have chosen has already been used. Do not redefine any LaTeX or $\mathcal{A}\mathcal{M}\mathcal{S}$-LaTeX command, as this could cause problems in AMS production. New definitions may be used to provide shorthand forms for mathematical expressions that are used frequently. Do not use new definitions for text. Use commands

TABLE 1. Top matter tags

```
\documentclass{amsart}
⟨preamble commands, such as \newcommand, etc.⟩

\begin{document}
```

	Required by Journals	Required by Books
`\title[...]{...}`	yes[1]	yes[1]
`\author[...]{...}`	yes[1]	yes[1]
`\address{...}`	yes	yes
`\curraddr{...}`	no	no
`\email{...}`	no	no
`\urladdr{...}`	no	no
`\dedicatory{...}`	no	no
`\date{...}`	–[2]	—
`\thanks{...}`	no	no
`\translator{...}`	–[2]	–[2]
`\keywords{...}`	no	no
`\subjclass{...}`	yes	yes
`\begin{abstract}...\end{abstract}`	yes[3]	no
`\maketitle`	yes	yes

[1] If no short form is needed, omit the brackets.
[2] If this is necessary, it will be filled in by the AMS staff.
[3] For the *Journal of the American Mathematical Society*, abstracts are optional.

and environments provided by the AMS document classes whenever applicable—for example, you should use the AMS `proof` environment for proofs rather than define your own alternative.

Title. In article or chapter titles for books, the first and last words of the title and all nouns, pronouns, adjectives, adverbs, and verbs should be capitalized; articles, conjunctions, and prepositions should be lowercased except for the first and last words of the title. For journal articles, only the first word and proper nouns should be capitalized. This is true even if the publication in which the paper appears has another style; the style for the particular publication will be generated automatically when the paper is processed at the AMS. A multiline title may be left for LaTeX to break, or a desired break may be indicated by `\\`.

Unless the title is very short, provide a form of the title suitable for use in running heads. This should be entered in [brackets] between the tag `\title` and the full title. Do not use author-defined macros in the title.

Author information. Enter the name(s) of the author(s) in caps and lowercase using the tag `\author`. Each author's name should be entered with a separate `\author` command; names will be combined by LaTeX according to the dictates of the document class, which often vary.

If the author name(s) cannot fit in the space available for the running head, enter a shortened form for each name in [brackets] between the tag `\author` and the full name. Acceptable shortened forms use initials for all but the surname(s). If there are more than two authors, the running heads must be specified explicitly:

`\markboth{`⟨name of first author⟩ `ET AL.}{`⟨short title⟩`}`

Data provided with `\markboth` must be in all capital letters (except for included math). Place `\markboth` after `\maketitle` in your file.

For each author you should provide one or more addresses. The address where the research was carried out should be tagged as `\address{...}`. The address should be divided by `\\` into segments that correspond to address lines for use on an envelope. If the current address is different from the research address, the current address should be given next, tagged as `\curraddr{...}`. Following these addresses, you should give an address for electronic mail if one exists, using `\email{...}`. You may also include a URL address using `\urladdr{...}`. Regular, current, e-mail, and URL addresses must be grouped in that order by author.

Note that no abbreviations are to be used in addresses. Addresses are considered part of the top matter, but in AMS articles they are ordinarily printed at the end of the article following the bibliography. Suitable labels will indicate the current, e-mail, and URL addresses, typically *Current address*:, *E-mail address*:, *URL*:, respectively.

Dedication. Use the tag `\dedicatory` for such things as "Dedicated to Professor X on the occasion of his eightieth birthday." If the dedication is longer than one line, you may indicate a break with `\\`.

Acknowledgments of support and other first-page footnotes. `\thanks` is provided for acknowledgments of grants and other kinds of support for an author's research or for other general information not covered by one of the more specific commands such as `\keywords` or `\subjclass`. Like `\address`, `\thanks` can appear more than once in the top matter. Each occurrence will be printed as an unnumbered footnote at the bottom of the first page of the article.

Subject information. Subject classifications and key words, like acknowledgments, are part of the top matter and appear as footnotes at the bottom of the first page.

Subject classifications may be primary (the major topic(s) of the paper) or secondary (subject areas covered by ancillary results, motivation or origin of problems discussed, intended or potential field of application, or other significant aspects worthy of notice). At least one primary subject classification is **required**; additional primaries and secondaries are optional.

These classifications are entered as

`\subjclass{Primary` ⟨primary classifications⟩`;`
`Secondary` ⟨secondary classifications⟩`}`

To determine the classifications, use the 1991 Mathematics Subject Classification scheme that appears in annual indexes of *Mathematical Reviews* beginning in 1990. These numbers may also be found on the Web at URL: `http://www.ams.org/msc/`, on the electronic service e-MATH (`telnet e-math.ams.org` or `130.44.194.100; login` and `password` are `e-math`), or in printed form from Customer Services. Please use the full number; the two-digit code from the Contents of MR is **not** sufficient.

Key words are not required but may be provided by an author if desired. They should be tagged as `\keywords{...}`.

Abstract. The abstract is input with `\begin{abstract}...\end{abstract}`. It may comprise multiple paragraphs and include displayed material if appropriate. The length of the abstract depends primarily on the length of the paper itself and on the difficulty of summarizing the material; an upper limit of about 150 words for short papers and 300 words for long papers is suggested. Do not use author-defined macros in the abstract.

Note that when an AMS document class is used, the abstract should be placed before `\maketitle`, contrary to the practice shown in the LaTeX manual [LM]. This is necessary to ensure that the abstract can always be printed in the right order relative to other elements in the beginning material of a document, and with the proper vertical spacing above and below. If the abstract is given after `\maketitle`, it will be printed in place, but with a warning message.

4. Document body

Linking for the Web. The journals *Transactions*, *Proceedings*, *Bulletin*, *Journal of the AMS*, *Mathematics of Computation*, *Electronic Research Announcements of the AMS*, *Representation Theory*, and *Conformal Geometry and Dynamics* appear on the Web. Electronic manuscripts prepared in LaTeX for these journals should be tagged for maximum linking on the Web. For use of `\label`, `\ref`, and `\cite`, see [GMS].

Headings. Four levels of headings are provided to permit logical sectioning of a manuscript. These headings are applicable to individual articles and to chapters of a monograph. (Headings specific to monographs are listed under *Monograph formatting.*)

```
\specialsection{...}
\section[...]{...}
\subsection[...]{...}
\subsubsection[...]{...}
```

`\specialsection` is for long articles that need extra divisions (e.g., parts) at a level above the `\section` level.

Explicit line breaks are obtained by `\\` in first-level section headings.

Any heading may be given a label to allow references to be made to it, by including a `\label{...}` command with a unique identifier directly after the heading. References are made using the command `\ref{...}` and the same identifier. For example,

```
\section{Monograph formatting}
\label{s:mono}
```

will establish a label for this section that can be referred to with `\ref{s:mono}`. Cross references of this sort will require LaTeX to be run at least twice for proper resolution. A warning at the end of the LaTeX run, “Cross references may have changed ... ” should be heeded in this regard.

Mathematical text. For instructions on preparing mathematical text, refer to [ALG] and [LM].

Care should be taken to use math mode for *all* mathematical expressions, no matter how short or insignificant they are. For example, in the phrase "a group of class 2," the "2" should be treated as mathematical text and placed between dollar signs: `$2$`. One reason for this is that numerals should always be roman in mathematical expressions, whereas in ordinary text environments LaTeX sets them in the style of the surrounding text; see also the *Roman type* section below. Mathematics is also treated differently from text in electronic journals appearing on the Web.

Lists. You should follow plain LaTeX conventions for producing list environments.

Theorems, lemmas, and other proclamations. Theorems and similar elements are treated as environments in LaTeX. Three different theorem styles are provided by AMS document classes: `plain`, `definition`, and `remark`. By referring to these styles and using the `\newtheorem` command, you can build a complement of theorem environments appropriate for any paper or monograph. The use of these commands is described in the *$\mathcal{A}\mathcal{M}\mathcal{S}$-LaTeX User's Guide* [ALG]. All `\newtheorem` specifications should be included in the preamble. Theorem environments are defined in `amsthm.sty` which is loaded automatically by the AMS document classes. This is incompatible with the LaTeX `theorem` package, which should not be used.

The following list summarizes the types of structures which are normally associated with each style. Use `\theoremstyle` as described in [ALG].

`plain`	Theorem, Lemma, Corollary, Proposition, Conjecture, Criterion, Algorithm
`definition`	Definition, Condition, Problem, Example
`remark`	Remark, Note, Notation, Claim, Summary, Acknowledgment, Case, Conclusion

A related environment `proof` is to be used for proofs. This will produce the heading "Proof" with appropriate spacing and punctuation. An optional argument in square brackets can be used to substitute a different heading:

`\begin{proof}[`⟨heading text⟩`]`

A "Q.E.D." symbol is automatically appended at the end of a proof (see [ALG] for details).

Equations. Check displayed equations carefully, making sure they are broken and aligned following the guidelines in [MIT, pp. 38–41].

Roman type. Numbers, punctuation, (parentheses), [brackets], {braces}, and symbols used as labels should always be set in roman type. This is true even within the statement of a theorem, which is set in italic type.

Be careful to distinguish between roman elements that are mathematical in nature (e.g., "a group of class 2"), and those that are part of the text (e.g., a label or a year). Mathematical expressions are, as usual, enclosed within dollar signs `$...$`; roman text elements should be coded as `\textup{...}` in nonroman environments such as theorems.

Abbreviated forms of mathematical terms are also usually set in roman type to distinguish them from mathematical variables or constants. Use the control sequences for common mathematical functions and operators like `log` and `lim` (see [ALG, §4]). Use `\DeclareMathOperator` to add additional operator names (see [ALG]).

The style of reference citations, though publication dependent, is usually roman. In order to ensure consistency, **always** use the standard LaTeX `\cite` command when citing a reference.

Exercises setup. Exercises are produced using the `xca` and `xcb` environments. `xca` is available for all publications (but must be defined in the document preamble; see the sample paper) and is used for exercises that occur within a section. `xcb` is available only for monographs and is used for exercises that occur at the end of a chapter.

Indexing facilities. The facilities of `makeidx` (i.e., the tags needed for *MakeIndex*) are already included in AMS document classes. Use of *MakeIndex* is described in [LM], Appendix A.

5. Graphics

Throughout this section artwork, figures, halftones, tables, etc., are all referenced using the general term *graphics*, though in some cases a specific topic, such as tables, may be described separately.

Figures and tables are usually handled as floating inserts. Such items are often so large that fitting them into the document at the point of reference may cause problems with paging. Placing such items into a floating insert allows them to be repositioned automatically by LaTeX as required for good pagination.

A floating insert generally contains one of three possibilities: blank space for an external graphic to be inserted by hand after LaTeX has run, LaTeX code that produces an object such as a table or commutative diagram, or a command to incorporate an item produced by another application (most often an Encapsulated PostScript (EPS) file produced by a graphics utility) (see *Embedded graphics*).

Graphics placement. Graphics should

1. be numbered consistently throughout the paper (figures and tables are numbered separately),
2. be placed at the top or bottom of the page, and
3. have an in-text reference.

A figure or table should not precede its first text reference unless they both appear on the same page spread, and a figure or table must definitely appear within the same section as its first text reference. When a figure or table is an integral part of text, it may appear unnumbered in place in the middle of text.

Figures and tables should be allowed to float according to the LaTeX defaults which are preset by the style file. If you are NOT preparing a camera-ready submission you could introduce major problems with pagination if you hard-set your figures and tables by using the `[h]` option. By using the author package class file and using no figure or table options, your figures and tables should always float to the top or bottom of the page automatically. If an insert does not fit on the page where specified, LaTeX will automatically shift it to the next page. For electronic manuscripts, the final placement of inserts will be determined by the AMS editorial staff, on the basis of the most appropriate page layout.

Captions. Floating inserts usually have captions positioned above a table and below a figure. The following is the general structure used to specify a figure insert, with a caption at the bottom:

`\begin{figure}`
`\vspace{`⟨dimen⟩`}` or ⟨optional code for the insertion body⟩
`\caption{`⟨caption text⟩`}`
`\label{`⟨reference label⟩`}` (optional)
`\end{figure}`

The following is the general structure for a table insert, with a caption at the top:

`\begin{table}`
`\caption{`⟨caption text⟩`}`
`\label{`⟨reference label⟩`}` (optional)
`\vspace{`⟨dimen⟩`}` or ⟨optional code for the insertion body⟩
`\end{table}`

Use the `\vspace{`⟨dimen⟩`}` option within the figure or table environment to leave blank space for a graphic to be pasted into place. If a ⟨dimen⟩ is specified, its value should be the exact height of the object to be pasted in. Extra space around the object and the caption will depend on the document style and will be provided automatically.

Caption labels will be supplied automatically, set in caps and small caps. The ⟨caption text⟩ is any descriptive text that may be desired. It will be set in roman type, and may be omitted if no descriptive text is desired. A reference label should usually be associated with the caption; a reference in text to the figure or table would be of the form `\ref{`⟨reference label⟩`}`.

If you choose to include the LaTeX code for a figure, table, or other captioned object in the input, then omit the `\vspace{`⟨dimen⟩`}` line and type the code in the area indicated. The size will be calculated automatically and the caption set in the appropriate location above or below the object.

Electronic graphics. Graphics may be submitted to the AMS in an electronic format. The AMS recommends that graphics created electronically be saved in Encapsulated PostScript (EPS) format. This includes graphics originated via a graphics application as well as scanned photographs or other computer-generated images.

Note that figures and tables created with the LaTeX figure or table environments do **not** need to be submitted separately from the LaTeX file.

Many popular graphics applications under a Macintosh, Windows, or Unix environment allow files to be saved in EPS format. However, if your package does not support EPS output, save your graphics file in one of the standard graphics formats—such as TIFF, PICT, GIF, etc.—rather than in an application-dependent format. For example, if you are using SuperPaint on a Macintosh, do not send files in SuperPaint format. Instead, save the file in PICT format from SuperPaint and send the PICT files to the AMS. Graphics files submitted in an application-dependent format are not likely to be used. No matter what method was used to produce the graphic, it is necessary to provide a paper copy to the AMS.

Note: If you scale a figure before sending it to us, remember that line weights also scale. Bear in mind that the lightest line weight which will reproduce clearly at high resolution is 0.5pt after scaling. Do NOT specify "hairline" weight, as this will be nearly invisible at high resolution and will disappear in the printing process. If a rule line is screened, its weight should be no lighter than 1 point after scaling.

Graded line weights should increase in increments of at least 0.5pt. Increments less than this are insufficiently distinguishable at high resolution.

Screened fills should be screened not less than 15% (less will print as white) and not greater than 85% (greater will print as black).

Ideally, text included in graphics files should be font outlines rather than bitmaps, because the AMS typesets its publications on a high-resolution imagesetter, not a laser printer. Text or lines in graphics which are 300dpi bitmaps (which look fine next to your laser-printed output of your article) may appear poor in quality next to the high-resolution text of AMS publications. If bitmaps of characters are part of bitmapped line art files, output will be ideal if the bitmapped characters are at 1200dpi.

Nonelectronic graphics. These graphics should be drawn in black ink with clean, unbroken lines on nonabsorbent paper. Whenever possible, fonts used in graphics should match those used in the text. Authors' original graphics are used whenever possible in AMS publications.

Send the originals of photographs or computer-generated images to the AMS. A photocopy of such an image can be used to identify it. To avoid damage to photographic images, do not use paper clips or staples, and do not tape them to a sheet of paper.

For a color image (whether it is to be converted to a black and white image or is to appear in color), submit one of the following (listed in order of preference):

- glossy color photograph,
- color transparency or interneg,
- color slide.

Color graphics. AMS policy requires that the author pay for the cost of producing color graphics. If the author is unable to pay the cost, and the editor of the book or journal deems it mathematically essential to the manuscript, the AMS will, with the permission of the Publisher, pay for one (1) page of 4-color.

Color figures should have the resolution of at least 266 pixels per inch when printed at 100%. Ideally, they should be in TIFF or EPS format (note that PostScript is not the same as Encapsulated PostScript; the latter is a subset of the former).

Embedded graphics. There are two ways of utilizing EPS graphics with a LaTeX document:

1. Calls to EPS files can be embedded within the LaTeX file and automatically incorporated by LaTeX.
2. Blank space of an appropriate size for each graphic can be left in the LaTeX document. Graphics files can then be sent to the AMS for high-resolution typesetting and manual positioning in the typeset document.

In either case, submit a separate file for each graphic along with the LaTeX document. In cases where files cannot be saved in an EPS format, you may choose to leave space in the LaTeX document and submit the graphics files separately.

If you choose to submit a file with embedded references to external EPS files, the preferred method for incorporating the EPS files into the LaTeX file is to use the `graphicx` package, part of the `graphics` bundle of LaTeX. The manual for this package is the file `grfguide.tex`; a `.ps` version is also included in the bundle for convenience. Another valuable reference is the manual "Using EPS Graphics in LaTeX 2_ε Documents" [RE].

Other packages are not recommended, as there are numerous areas of incompatibility which may result in the need for manual intervention, delaying processing and increasing the cost.

The AMS does not provide this macro bundle to authors, as it is widely available in the TeX community. Also, there are a few requirements if these macros are used:

1. DO NOT include any path names of the included PostScript files. For instance, do not say `\includegraphics*{/usr/joe/book/figures/fig1.ps}`. Instead remove all explicit path references, so that the above example would become `\includegraphics*{fig1.ps}`. If an explicit path is needed to point to a separate graphics area on your system, specify this with the separate command `\graphicspath{`⟨directory list⟩`}` placed in the preamble.
2. Include printed copies of all of the PostScript files for the graphics with the LaTeX file.
3. If you are submitting to a camera-ready publication, you must use a file `graphics.cfg` containing the line `\ExecuteOptions{dvips}` when you run LaTeX to create the DVI or PostScript file to send to the AMS.

6. Bibliographic references

Using BibTeX to prepare a bibliography. An author may find it convenient to maintain a file of references in BibTeX form, as described in the LaTeX manual [LM, Appendix B]. Two BibTeX styles are provided:

`amsplain.bst`: will produce numeric labels, and

`amsalpha.bst`: will produce labels constructed from the author name(s) and year of publication.

Both will translate references in a BibTeX input (`.bib`) file to LaTeX input in a `.bbl` file in the form appropriate for AMS publications, including all necessary formatting instructions. This method of preparing bibliographies is therefore recommended.

To access a BibTeX bibliography in a paper or monograph, include these instructions in the appropriate place in the input file:

`\bibliographystyle{`⟨style⟩`}` `amsplain` or `amsalpha`
`\bibliography{`⟨name of bibliography `.bib` file⟩`}`

Running BibTeX on the `.bib` file will produce a `.bbl` file. The `.bib` file may have any name the author finds convenient; however, the `.bbl` file must have the same name as the source file for a monograph from which it is input, so it may be necessary for the author to rename it. For an article, after the bibliography has been completed (including processing by BibTeX), the contents of the `.bbl` file should be inserted into the main article input file, replacing the `\bibliographystyle` and `\bibliography` statements.

Items in the bibliography are usually ordered alphabetically by author. BibTeX processing may alter this order, especially if the style `amsalpha.bst` is used.

All categories of bibliographic entries listed in the LaTeX manual [LM, §B.2.1] are supported in the two BibTeX styles. In addition to the fields listed in §B.2.2, a `language` field is provided for use in identifying the original language of an item whose title has been translated.

Preparing a bibliography without BibTeX. The references section of a paper begins with the command `\begin{thebibliography}{`⟨model label⟩`}` and ends with `\end{thebibliography}`. `\begin{thebibliography}` sets the head for the references, switches to the correct type size and sets the indentation for the labels to a width appropriate for the model given in the second argument. Thus the widest label in the bibliography should be used as the model; for example, `99` will provide space for a 2-digit label.

In a monograph, where the bibliography forms a separate chapter, the command `\begin{thebibliography}` starts a new chapter and then does the other setup mentioned above for printing the references.

For the proper order of reference elements and use of fonts and punctuation, look at an issue or volume in the journal or book series for which your document is intended and follow the examples you see there.

All references. The beginning of each item must be indicated explicitly, with the command `\bibitem{`⟨bibitem label⟩`}`. The LaTeX default is for references to be numbered (automatically); however, other labels may be used by inserting an optional key argument in square brackets between the command and the internal label:

```
\bibitem[ABC]{ABC}
```

The item label and the key need not be identical. Note that whatever is within the `[ ]` is what prints. Whatever is within the curly braces is used for linking and should not include any math.

Give at least one full name; initials and last name is an acceptable form. If a subsequent reference is by the same author(s), use `\bysame` instead of the name(s).

For examples, refer to [MIT].

7. Monograph formatting

A monograph is a long work by a single author or co-authors on a single subject. Each chapter must be prepared as a separate file. In addition, there will be a "top-level" file (which inputs all the others) and perhaps a file containing the bibliography. These files should be given meaningful names, so that when they are transmitted to the AMS, there will be no question about which file represents which chapter. For example, a monograph by author Grey might be composed of files named `grey.tex` (the top-level file), `grey-ch1.tex`, `grey-ch2.tex`, ... , `grey-ch12.tex`, `grey-appa.tex`, etc., and `grey.bib`. If the author name is a common name, please include something to make it unique, such as first initials.

Information that identifies the author(s), the subject matter of the monograph, acknowledgments of support, and so forth, will appear in the front matter of the book. Place this information in the top-level file, and use the tags shown below. Most of these are the same as the tags associated with the top matter of an article; see the *Top matter* section for explanations and an indication of which tags are required.

Starting a new AMS-LaTeX monograph. Book driver files are generally made up of the following:

- `\documentclass`
- preamble (where extra definitions might go)
- `\begin{document}`

- \frontmatter
- title page and copyright page information
- \maketitle (to set the title page and copyright page)
- \mainmatter
- \include files
- \backmatter
- more include files
- \end{document}

The table of contents will be produced automatically from a .toc file produced anew in each run of LaTeX. Since there is no .toc before the first run, the body of the table of contents will be empty on the first run. It is AMS style to include only first-level heads, chapter titles, and part titles in the table of contents.

The document file will typically look something like:

```
\documentclass{conm-m-l}

\includeonly{preface,chap1,biblio,index}

\newtheorem{theorem}{Theorem}[section]
\newtheorem{lemma}[theorem]{Lemma}

\theoremstyle{definition}
\newtheorem{definition}[theorem]{Definition}
\newtheorem{example}[theorem]{Example}
\newtheorem{xca}[theorem]{Exercise}

\theoremstyle{remark}
\newtheorem{remark}[theorem]{Remark}

\numberwithin{equation}{section}
\numberwithin{figure}{chapter}

\begin{document}
\frontmatter
\title[]{} % omit brackets if not used
\author[]{} % omit brackets if not used
\address{}
\curraddr{}
\email{}
\urladdr{}
\thanks{}
\author[]{}
\address{}
\thanks{}

\subjclass{}

\begin{abstract}
\end{abstract}
```

```
\maketitle

\tableofcontents

\include{preface}

\mainmatter
\include{}
\include{}

\backmatter
\include{}
\include{}

\end{document}
```

Chapter titles. There are three common variations of the chapter title, of which the form with a chapter number is most common:

```
\chapter{Matrix Algebras}
```

The second variation is an appendix, where the word "Appendix" replaces the word "Chapter." Use the command `\appendix` before the first `\chapter` command in a sequence of appendix chapters [LM].

```
\appendix
\chapter{Poisson Integral}
```

Not only will the "Chapter" word be replaced, but also the counter will produce letters "A", "B", "C", etc., instead of numbers.

The third variation is used for an element such as a preface or introduction, which has no pretitle text at all. For this, use the `\chapter*` command:

```
\chapter*{Preface}
```

Monograph running heads. The chapter title is used for the left running head and the text of section headings (from `\section`) appears as the right running head. The chapter title repeats if there are no sections. It is not uncommon for the text of a heading to be too long to fit in the running head width; in such a case use the square-bracket option to specify a shortened form of the heading for use in the running heads:

```
\section[Fourier coefficients of periodic functions]
   {Fourier coefficients of continuous periodic functions
   of bounded entropy norm}
```

If the chapter title is too long to fit as a running head, a shortened form can be supplied in a similar way.

Numbering of figures and tables. The preferred AMS style for numbering figures and tables is to start numbering from 1 within each chapter, and to set the number with the chapter number preceding the element number; for example, the first figure in Chapter 5 would be numbbered "Figure 5.1". The `amsbook` document class resets figure and table numbers automatically. To add the chapter number, place these lines in the preamble of the top-level file:

```
\numberwithin{figure}{chapter}
\numberwithin{table}{chapter}
```

8. Converting an existing document to use an AMS document class

Old LaTeX. If you have an existing document that was written for LaTeX 2.09, with the `article` or `book` documentstyle, and it did not use any AMS packages such as `amsfonts` or `amstex`, then the first step is to change the documentstyle line to

```
\documentclass[nomath,noamsfonts]{amsart}
```

or

```
\documentclass[nomath,noamsfonts]{amsbook}
```

respectively.

Then the author and address information should be rewritten as described in the subsection on "author information" in these instructions. In the case of an article, you might want to specify a shortened version of the title for the running heads using the `[]` option of the `\title` command.

Existing `\newtheorem` commands should be grouped according to the three 'theorem styles' (plain, definition, remark) described in [ALG], and the corresponding `\theoremstyle` command should be added at the head of each group.

$\mathcal{A}\mathcal{M}\mathcal{S}$-LaTeX version 1.0 or 1.1. For a document that was written for version 1.0 or 1.1 of $\mathcal{A}\mathcal{M}\mathcal{S}$-LaTeX, conversion to version 1.2 involves first of all changing `\documentstyle` to `\documentclass`, as required by current LaTeX.

In e-mail addresses, change double `@@` to a single `@` character.

Instances of the `pf` and `pf*` environments should be changed respectively to

```
\begin{proof}
...
\end{proof}
```

and

```
\begin{proof}[Alternate Heading]
...
\end{proof}
```

If you want to accurately preserve the effect of explicit size-changing commands, you should also make the following changes: Change any instances of `\small` to `\Small`. Change any instances of `\tiny` to `\Tiny`. Change any instances of `\large` to `\Large`.

$\mathcal{A}\mathcal{M}\mathcal{S}$-TeX. There is no easy way to convert an $\mathcal{A}\mathcal{M}\mathcal{S}$-TeX document to an $\mathcal{A}\mathcal{M}\mathcal{S}$-LaTeX document; the command set and syntax are too different (think of the automatic numbering and cross-referencing, in particular). If it is necessary to convert an $\mathcal{A}\mathcal{M}\mathcal{S}$-TeX document, all experience shows that the fastest way, and the one that introduces fewest errors, is to have an experienced $\mathcal{A}\mathcal{M}\mathcal{S}$-LaTeX keyboarder retype the document from a printed copy, and proofread again to catch typos.

9. Getting help

If you encounter difficulties in preparing or submitting an $\mathcal{A}_\mathcal{M}\mathcal{S}$-LaTeX manuscript in electronic form after it has been accepted for publication by the appropriate editorial board, you can ask for help from the American Mathematical Society at:

Technical Support
Electronic Products and Services
P. O. Box 6248
Providence, RI 02940-6248

or

201 Charles Street
Providence, RI 02904-2294

Phone: 800-321-4267, ext. 4080 or 401-455-4080
Internet: `tech-support@ams.org`

10. References

[AFG] *AMSFonts version* 2.2 *user's guide*, Amer. Math. Soc., Providence, RI, 1997.

[AH] *AMS author handbook*, Amer. Math. Soc., Providence, RI, 1996.

[ALG] *$\mathcal{A}_\mathcal{M}\mathcal{S}$-LaTeX version* 1.2 *user's guide*, Amer. Math. Soc., Providence, RI, 1996.

[ASMR] *Abbreviations of names of serials reviewed in Mathematical Reviews*, Amer. Math. Soc., Providence, RI, revised annually.

[GMS] Michel Goossens, Frank Mittelbach, and Alexander Samarin, *The LaTeX companion*, Addison-Wesley Co., Reading, MA, 1994.

[Joy] M. D. Spivak, *The joy of TeX*, 2nd revised ed., Amer. Math. Soc., Providence, RI, 1990.

[LM] Leslie Lamport, *LaTeX: A document preparation system*, 2nd revised ed., Addison-Wesley, Reading, MA, 1994.

[MIT] Ellen E. Swanson, *Mathematics into type*, Amer. Math. Soc., Providence, RI, 1979.

[ML] George Grätzer, *Math into LaTeX: An introduction to LaTeX and $\mathcal{A}_\mathcal{M}\mathcal{S}$-LaTeX*, Birkhäuser, Boston, MA, 1996.

[NJH] Nicholas J. Higham, *Handbook of writing for the mathematical sciences*, SIAM, Philadelphia, PA, 1993.

[NM] Norman Walsh, *Making TeX Work*, O'Reilly & Associates, Inc., Sebastopol, CA, 1994.

[RE] Keith Reckdahl, "Using EPS Graphics in LaTeX 2_ε Documents", available in electronic form from `http://ftp.tex.ac.uk/tex-archive/info/epslatex.ps` and other CTAN sites.

[SHSD] Norman E. Steenrod, Paul R. Halmos, Menahem M. Schiffer, and Jean A. Dieudonné, *How to write mathematics*, 4th printing 1993, Amer. Math. Soc., Providence, RI, 1973.

[TB] Donald E. Knuth, *The TeXbook*, Addison-Wesley, Reading, MA, 1984.

11. Sample papers[1]

[1]The printed version of this document contains sample papers and related source code for journals, proceedings, and monographs. The electronic version of these instructions does not include sample papers.