

# L<sup>A</sup>T<sub>E</sub>X Class for The *Annals of Mathematics*\*

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## Abstract

This package provides a class for typesetting articles for The *Annals of Mathematics*

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# 1 Introduction

The *Annals of Mathematics* is published bimonthly with the cooperation of Princeton University and the Institute for Advanced Study. Founded in 1884 by Ormond Stone of the University of Virginia, the journal was transferred in 1899 to Harvard University, and in 1911 to Princeton University. Since 1933, the Annals has been edited jointly by Princeton University and the Institute for Advanced Study (see <http://annals.princeton.edu/annals/about/journal/about.html>).

This class presents a complete redesign of the journal style—with new fonts and new interface.

An author well acquainted with AMS $\LaTeX$  should find this package easy to use and configurable. The User Manual below illustrates the basic use of the class and discusses the differences with `amsart`. For an in-depth tutorial of AMS $\LaTeX$  I could recommend the excellent book [1].

## 2 User's Guide

### 2.1 Installation

The installation of the class follows the usual practice [2] for  $\LaTeX$  packages:

1. Run `latex` on `aomart.ins`. This will produce the file `aomart.cls`.
2. Put the file `aomart.cls` to the place where  $\LaTeX$  can find them (see [2] or the documentation for your  $\TeX$  system).
3. Update the database of file names. Again, see [2] or the documentation for your  $\TeX$  system for the system-specific details.
4. The file `aomart.pdf` provides the documentation for the package (this is the file you are probably reading now).

As an alternative to items 2 and 3 you can just put the files in the working directory where your `.tex` file is.

The class uses some other  $\LaTeX$  classes or packages. Most probably, they are already installed on your system. If not (or if their versions are very old), you need to download and install them. Here is the list:

1. `amsart` class and related packages [3],
2. Package `hyperref` [4],
3. `ifpdf` package [5],
4. `fancyhdr` package [6],
5. `cmtiup` package [7] for “special italics” with upright digits and punctuation. Note that since many distributions do not include this package, you may need to install it yourself. Just download the file <http://mirrors.ctan.org/fonts/cm/cmtiup.zip>, unzip it in your `TEXMF` directory and rebuild the file names database with the command like `mktexlsr`,

6. yhm<sub>math</sub> package [8].

## 2.2 Invocation

To use the class, put in the preamble of your document

```
\documentclass[options]{aomart}
```

The class internally loads **amsart**, so all facilities of **amsart** [1, 9] can be used in the source.

The class should work with the **Babel** [10] package. At present, English, French and German languages are fully supported.

*options* The options **draft** and **final** work in the same way as for **amsart** and standard  
**draft** L<sup>A</sup>T<sub>E</sub>X. If the option **draft** is chosen, the overfull lines are marked by black  
**final** boxes on the margins *and* the `\includegraphics` prints blank placeholders for the  
images. The option **final** (default) switches off the marking of overfull lines and  
restores the behavior of `\includegraphics`. To switch on just the overfull marks,  
without changing the behavior of `\includegraphics`, one can either explicitly  
pass the option **final** to **graphics** package:

```
\documentclass[draft]{aomart}  
\usepackage[final]{graphics}
```

or add in the beginning of the document

```
\overfullrule=5pt
```

*option* The option **manuscript** is intended to facilitate the communications between  
**manuscript** the editor and the author. It enables two things:

1. Numbering of lines in the manuscript is switched off in the normal mode, but is on in the manuscript mode.
2. Command `\EditorialComment` is no-op in normal mode, but produces marginal commentaries in the manuscript
3. Hyperlinks are black in normal mode, but blue in manuscript mode.

*option* The option **screen** is intended for the onscreen version of the article. If this  
**screen** option is selected, the links are blue colored, and the margins are reduced.

*option* Starting from version 1.9 (2011) the formatting of DOI numbers changed ac-  
**olddoi** cording to the new recommendations from CrossRef. The option **olddoi** switches  
on the “old” formatting. It is used for compatibility reasons.

*option* Starting from version 1.5 (2016) the formatting of DOI numbers changed  
**doi2016** again according to Crossref recommendations. The option **doi2016** switches to  
the version existed between 2011 and 2016.

*option* Since June 2017 keywords and AMS Mathematical Subjects classification num-  
**oldkeywords** bers are printed on the title page. The option **oldkeywords** suppresses this.

*options*      The size-changing options of `amsart` class (`8pt`, `9pt`, ..., `12pt`) have no effect other than producing a warning in the log since the journal is designed for only one type size (roughly corresponding to `11pt` of `amsart`).

`8pt`  
`9pt`  
`10pt`  
`11pt`  
`12pt`

## 2.3 Top Matter

There are two kinds of top matter commands: the ones used primarily for authors and the ones used primarily for editors. We describe them separately.

The macros described below must be issued in the preamble of the document, i.e. before `\begin{document}`. They produce fatal error otherwise. This behavior is required by the way non- $\text{\TeX}$  scripts process the files to produce metadata.

The only exception is `abstract`, which should be placed between after `\begin{document}`.

### 2.3.1 Commands for Authors

`\title`      The command `\title`, as in `amsart` class, has two arguments: one optional, and one mandatory:

`\title[<ShortTitle>]{<FullTitle>}`

The mandatory argument is the full title of the article. The optional argument, if present, defines the shorter version of the title for running heads. If the optional argument is absent, the full title is used instead.

The optional argument should be used in two cases: when the full title is too long to fit in the running head, *and* when the author wants to add a footnote or linebreaks to the title.

`\author`      The interface for specifying the authors and their affiliations is close the the one of `amsart` [11] (and different from the standard  $\text{\LaTeX}$ ). For each author a separate command `\author` should be used, followed by `\address` and (optionally) `\curraddr`, `\email`, `\urladdr` and `\orcid`. Note that the house style of the *Annals of Mathematics* requires writing `\address` in the form *Institution, City, State* (or *Institution, City, Country* for non-US locations). Like the newer versions of `amsart`, `aomart` does *not* require the doubling of the `@` symbols in the e-mail addresses. The macro `\author` has two arguments, similarly to `\title`:

`\author[<AbbrevName>]{<FullName>}`

The optional argument defines the shorter form of the author's name to be included in the running head.

`\givenname`      The papers published in the *Annals of Mathematics* are included in various databases. For the indexing purposes it is important to correctly separate the authors' names into "First Name/Surname" parts. This operation is not easy for the computers. Therefore we decided that the authors should know best how to deal with their names. The macros `\givenname` and `\surname` are used to indicate how to split the name into the parts.

`\fulladdress`      Another command which does not affect the typesetting is `\fulladdress`. It is used to store the full mailing address of the author for the online version of the journal and various databases.

`\shortauthors` In some cases the authors list may be too long for the running head, even if the abbreviated forms are used for each author. In this case it is possible to change the running head by a *redefinition* of the command `\shortauthors`. This redefinition must be done after all `\author` commands, but before `\maketitle`:

```
\renewcommand{\shortauthors}{A.~Smith et al}
```

`\thanks` Like `amsart` (and unlike standard L<sup>A</sup>T<sub>E</sub>X), `aomart` allows `\thanks` only *outside* of commands `\title` and `\author`.

`\copyrightnote` Normally each paper is copyrighted by Department of Mathematics, Princeton University. This is reflected in the footnote on the first page of the article. However, by arrangement with the editors, certain papers may have different copyright. The command `\copyrightnote{copyright statement}`, if issued, changes the footnote to the corresponding text, for example:

```
\copyrightnote{\textcopyright~2012 by the authors. This paper may
be reproduced, in its entirety, for noncommercial purposes.}
```

Note that if you issue this command, you should explicitly include both the copyright sign and the year unless the paper does not have a copyright, for example:

```
\copyrightnote{This paper is in the public domain}
```

`abstract` The abstract of the paper must be put between `\begin{abstract}` and `\end{abstract}`. Unlike the situation in `amsart` class, abstract may be put *after* `\maketitle`.

`\maketitle` The macro `\maketitle` typesets the top matter. All top matter information should be specified before this command.

### 2.3.2 Commands for Editors

The commands described in this section should be used by the editors to insert the information about the published paper. They must be put before the `\maketitle` command.

`\keyword` The command `\keyword` adds a keyword to the list of keywords. This command may be repeated, for example

```
\keyword{Embedding theorem}
\keyword{Relatively hyperbolic group}
```

`\subject` The command `\subject` has three parameters: whether the subject is primary or secondary, the classification scheme and the subject itself, for example

```
\subject{primary}{msc2000}{20E45}
\subject{secondary}{msc2000}{20F65}
```

`\formatdate`      The macro `\formatdate` is used to format the dates in the commands. Its argument is the date in the format `YYYY-MM-DD`, for example

```
\formatdate{2010-08-13}
```

`\received`      The commands `\received`, `\revised`, `\accepted`, `\published`, `\publishedonline`  
`\revised`      accept as a parameter a date in the form `\formatdate{YYYY-MM-DD}`, for  
`\accepted`      example  
`\published`      `\received{\formatdate{2004-12-24}}`  
`\publishedonline`      `\revised{\formatdate{2006-04-12}}`  
                      `\accepted{\formatdate{2007-10-02}}`

`\proposed`      The macros `\proposed`, `\seconded`, `\corresponding`, `\editor`, `\version` are  
`\seconded`      used to set the corresponding metadata for the editorial process, for example  
`\corresponding`      `\proposed{E. D. Itor}`  
`\editor`      `\seconded{A. S. Sociate}`  
`\version`      `\corresponding{A. U. Thor}`  
                      `\version{2.1}`

`\volumenumber`      The macros `\volumenumber`, `\issuenumber`, `\publicationyear`, `\papernumber`,  
`\issuenumber`      `\startpage`, `\endpage` set up the corresponding data for the paper, for example:  
`\publicationyear`      `\volumenumber{172}`  
`\papernumber`      `\issuenumber{1}`  
`\startpage`      `\publicationyear{2010}`  
`\endpage`      `\papernumber{1}`  
                      `\startpage{1}`  
                      `\endpage{39}`

`\copyrightyear`      Note that if the argument of `\endpage` is empty, L<sup>A</sup>T<sub>E</sub>X tries to calculate the last  
                      page number as best as it can.  
                      In the standard copyright statement the copyright year is assumed to be the  
                      same as the `\publicationyear`. However, for special cases one can set the copy-  
                      right year explicitly, for example,

```
\publicationyear{2012}
\copyrightyear{2011}
```

Note that if you use your own copyright statement instead of the canned one  
(with the command `\copyrightnote`), you need to put there the copyright year  
explicitly instead of using this command.

`\doinumber`      The macros `\doinumber`, `\mrnumber` and `\zblnumber` set the information  
`\mrnumber`      about paper in four major reference databases: DOI (<http://www.doi.org/>),  
`\zblnumber`      MathSciNet (<http://www.ams.org/mathscinet/>), Zentralblatt MATH (<http://www.zentralblatt-math.org/>)  
`\arxivnumber`      and arXiv (<http://arxiv.org/>).

Code	Example
<code>\widetilde{AB}</code>	$\widetilde{AB}$
<code>\widehat{AB}</code>	$\widehat{AB}$
<code>\widetriangle{AB}</code>	$\widetriangle{AB}$
<code>\wideparen{AB}</code>	$\wideparen{AB}$
<code>\widering{AB}</code>	$\widering{AB}$
<code>\widebar{AB}</code>	$\widebar{AB}$

Table 1: Wide Mathematical Accents

[//www.zentralblatt-math.org/zmath/](http://www.zentralblatt-math.org/zmath/)) and arXiv (<https://www.arxiv.org>). The use of these macros should be obvious:

```
\doinumber{10.1215/S0012-7094-92-06520-3}
\mrnumber{1154181}
\zblnumber{0774.14039}
\arxivnumber{1234.567890}
```

Note the difference between these commands and the bibliography commands discussed in Section 2.7. Commands in this Section set up the data for the *current article*. Commands in Section 2.7 set up the data for the articles in the bibliography list.

Normally you should *not* use `\doinumber` command, since the class will construct the standard DOI for the paper from the volume, issue and paper information. Use it *only* if the result is by any reason wrong.

`\oldsubsections` Starting with version 1.2 we decreased the vertical spacing before `\subsection`. The command `\oldsubsections` restores the “old” values.

## 2.4 Additional Macros

`eqnarray` Thee class aomart loads the class amsart. Therefore all familiar amsmath commands [9] are available. In particular, there are many commands for writing multiline equations (`split`, `align`, `gather`, `multline`, ...). The environments `eqnarray` and `eqnarray*`, while still available, are *not* recommended and should be avoided if possible.

`\widetilde` A number of “wide” mathematical accents is available due to the (internally loaded) package yhmth [8]: `\widetilde`, `\widehat`, `\widetriangle`, `\wideparen`, `\widering`, `\widebar`. See Table 1 for the example of the usage.

`\wideparen` The macro `\EditorialComment[comments]` typesets the comments on the margins in the manuscript mode, for example,

`\widering` Erd\os proved the following theorem.\EditorialComment{A citation is  
`\widebar` needed}



`\fullref`      A set of macros is used to make more convenient clickable references in the on-line versions of papers. The package `hyperref` [4] makes clickable reference numbers in the phrases like

`\pfullref`

`\bfullref`

`\eqfullref`      `...in theorem~\ref{thm:Noeter}...`  
`...see equation~\eqref{eq:alpha}...`

However, it is more convenient for the readers if both the number *and* the word “theorem” or “equation” were clickable. The macros `\*fullref` solve this problem. Each macro has two arguments: the word and the reference, for example

`...in \fullref{theorem}{thm:Noeter}...`

The command `\pfullref` typesets the reference in parentheses. The command `\bfullref` typesets it in brackets, and the command `\eqfullref` uses the `\eqref` command, for example,

`...see \eqfullref{equation}{eq:alpha}...`

The Perl script `fullref.pl` can be used to convert change all references to the `\fullref` commands. It works in the following way:

`perl fullref.pl original.pl > result.pl`

The script converts all instances of combinations “word `\ref{reference}`” and “word~`\ref{reference}`” to “`\fullref{word}{reference}`”, and similarly for parenthesized references or `\eqref` commands. To prevent the converting, just put `\ref{reference}` or `\eqref{reference}` inside braces. The “word” here must not start with a backslash (i.e. must not be a macro itself). This prevents disastrous results for phrases like “see~`\ref{a}`, `\ref{b}`”.

The distribution includes two sample files, `aomsample.tex` and `aomsample1.tex`, the latter being obtained from the former by the script `fullref.pl`.

Note that `\autoref` command of `hyperref` provides for another mechanism that achieves the same goal. Unlike `\fullref` command, the command `\autoref` tries to figure out the name of the reference from the context. See the manual [4] for more information.

## 2.5 Theorems

`\newtheorem`      You can use the commands of `amsthm` package [12] like `\newtheorem{lem}{Lemma}` for numbered theorems, or `\newtheorem*{KL}{Klein’s Lemma}` for unnumbered theorems, or tune the numbering using the optional arguments of these commands.

To provide backward compatibility with some other classes used internally by the *Annals of Mathematics*, the class provides yet another optional argument for the command `\newtheorem`, allowing constructions like `\newtheorem[it]{lem}{Lemma}`. This optional parameter is not used in our typesetting.

The class provides two theorem styles:

**plain:** This is the default theorem style. It is used for Theorem, Lemma, Proposition, Conjecture, Corollary and Claim.

**definition:** This style is used for Definition, Remark, Notation, Condition, Example etc.

Note that AMS classes define the third theorem style, **remark**. In our class remarks are typeset in the **definition** style. To make the authors' lives easier we define the theorem style **remark**, which is identical to the theorem style **definition**.

## 2.6 Illustrations

The authors can use the `graphics`, `graphicx`, `PSTricks`, `pgf/tikz`, `Metapost` or other tools to include illustrations (see [13] for a comprehensive discussion of L<sup>A</sup>T<sub>E</sub>X graphics possibilities).

## 2.7 Bibliography

The authors are encouraged to use BibT<sub>E</sub>X for uniform style of bibliography. The distribution includes the BST files `aomplain.bst` and `aomalpha.bst`. These files have several additional non-standard fields:

**mrnumber:** MathSciNet number for the article.

**zblnumber:** Zentralblatt number for the article.

**doi:** DOI number for the article.

**jfmnumber:** JFM number for the article.

**arxiv:** ArXiv reference for the ArXiv manuscript.

**url:** If the reference is available online, the corresponding url.

**venue:** (for `conference` entries) The place where the conference took place.

**sortyear:** Some entries do not have a year set up (e.g. some `unpublished` entries. If you have several entries from the same author, some with a year, and some without, you may want to put them in a certain order. The field `sortyear` overrides `year` for the sorting purposes.

**titlenote:** this field is like `note`, but is typeset immediately after a title. It should be used for additional information, for example,

```
@Book{Knuth94:TheTeXbook,
  author = {Knuth, Donald Ervin},
  title = {The \TeX book},
  publisher = {Addison-Wesley Publishing Company},
  year = 1994,
```

```

series = {Computers \& Typesetting A},
address = {Reading, MA},
titlenote = {with illustrations by Duane Bibby}
}

```

**totalpages:** some articles (especially published in an electronic format) do not have start and end page numbers; instead you may put the total number of pages. If both **pages** and **totalpages** are present, **pages** take precedence.

**\doi**        There are several databases routinely used in the science and mathematics communities. Among them are DOI, MathSciNet, Zentralblatt, Jahrbuch Database, **\mr**        ArXiv. Many bibliographies include references to these databases. The commands **\zbl**        **\doi**, **\mr**, **\zbl**, **\jfm**, **\arxiv** are used to typeset these references. If you use **\jfm**        BibTeX, these commands are automatically used for the corresponding fields in **\arxiv**        your database entries.

## 3 Implementation

### 3.1 Identification

We start with the declaration who we are. Most `.dtx` files put driver code in a separate driver file `.drv`. We roll this code into the main file, and use the pseudo-guard `<gobble>` for it.

```
1 <class>\NeedsTeXFormat{LaTeX2e}
2 <*gobble>
3 \ProvidesFile{aomart.dtx}
4 </gobble>
5 <class>\ProvidesClass{aomart}
6 [2017/04/12 v1.19 Typesetting articles for the Annals of Mathematics]
```

And the driver code:

```
7 <*gobble>
8 \documentclass{ltxdoc}
9 \usepackage{array,booktabs,amsmath,graphics}
10 \let\widebar\overline
11 \usepackage{url}
12 \usepackage{amsfonts,yhmath}
13 \usepackage[breaklinks,colorlinks,linkcolor=black,citecolor=black,
14             pagecolor=black,urlcolor=black,hyperindex=false]{hyperref}
15 \PageIndex
16 \CodelineIndex
17 \RecordChanges
18 \EnableCrossrefs
19 \begin{document}
20   \DocInput{aomart.dtx}
21 \end{document}
22 </gobble>
23 <*class>
```

### 3.2 Options

The size-changing options produce a warning:

```
24 \long\def\@aom@size@warning#1{%
25   \ClassWarning{aomart}{Size-changing option #1 will not be
26     honored}}%
27 \DeclareOption{8pt}{\@aom@size@warning{\CurrentOption}}%
28 \DeclareOption{9pt}{\@aom@size@warning{\CurrentOption}}%
29 \DeclareOption{10pt}{\@aom@size@warning{\CurrentOption}}%
30 \DeclareOption{11pt}{\@aom@size@warning{\CurrentOption}}%
31 \DeclareOption{12pt}{\@aom@size@warning{\CurrentOption}}%
```

`\if@aom@manuscript@mode` Check whether we are in the manuscript mode

```
32 \newif\if@aom@manuscript@mode
33 \@aom@manuscript@modefalse
34 \DeclareOption{manuscript}{\@aom@manuscript@modetrue}
```

```

\if@aom@screen@mode Check whether we are in the screen mode
35 \newif\if@aom@screen@mode
36 \@aom@screen@modefalse
37 \DeclareOption{screen}{\@aom@screen@modetrue}

\if@aom@olddoi DOI processing is different in the “old” and new mode.
38 \newif\if@aom@olddoi
39 \@aom@olddoifalse
40 \DeclareOption{olddoi}{\@aom@olddoittrue}

\if@aom@doiMMXVI DOI processing is different in the 2016 and new mode
41 \newif\if@aom@doiMMXVI
42 \@aom@doiMMXVIfalse
43 \DeclareOption{doi2016}{\@aom@doiMMXVItrue}

\if@aom@oldkeywords Keywords processing is different in the “old” and new mode.
44 \newif\if@aom@oldkeywords
45 \@aom@oldkeywordsfalse
46 \DeclareOption{oldkeywords}{\@aom@oldkeywordstrue}

All other options are passed to amsart:
47 \DeclareOption*{\PassOptionsToClass{\CurrentOption}{amsart}}

Now we read the configuration file
48 \InputIfFileExists{aomart.cfg}{%
49 \ClassInfo{aomart}{%
50 Loading configuration file aomart.cfg}{%
51 \ClassInfo{aomart}{%
52 Configuration file aomart.cfg is not found}}

And process the options:
53 \ProcessOptions\relax

```

### 3.3 Loading Class and Packages

We start with the base class

```

54 \LoadClass[11pt]{amsart}

A bunch of packages:
55 \RequirePackage{fancyhdr, lastpage, ifpdf}
56 \RequirePackage[breaklinks,colorlinks]{hyperref}
57 \if@aom@screen@mode
58 \hypersetup{linkcolor=blue,citecolor=blue,
59 urlcolor=blue, pdfpagescrop={110 705 500 80}}%
60 \else\if@aom@manuscript@mode
61 \hypersetup{linkcolor=blue,citecolor=blue,
62 urlcolor=blue}%
63 \else
64 \hypersetup{linkcolor=black,citecolor=black,
65 urlcolor=black}%

```

```
66 \fi\fi
67 \urlstyle{rm}
```

Amsart has `\collect@body` macro. However, we want the `\long` version, so we use *environ*

```
68 \RequirePackage{environ}
```

### 3.4 Internationalization

There are some papers published in languages other than English. The *Babel* is expected to be used for them. Here we add some macros extending captions for these languages.

First, let us define English defaults:

```
\@aom@by This is just "By" in English:
69 \def\@aom@by{By}
```

```
\@aom@and This is "and" in English:
70 \def\@aom@and{and}
```

Now we can define internationalization:

```
71 \AtBeginDocument{\ifpackageloaded{babel}{%
72 \addto\captionsfrench{\def\@aom@by{Par}\def\@aom@and{et}}%
73 \addto\captionsgerman{\def\@aom@by{Von}\def\@aom@and{und}}%
74 \addto\captionsenglish{\def\@aom@by{By}\def\@aom@and{and}}{}}}
```

### 3.5 Fonts

We use *yhmath* for wide symbols:

```
75 \RequirePackage{yhmath}
```

We need *cmtiup* package, but we may find out it is not installed.

```
76 \IfFileExists{cmtiup.sty}{%
77 \RequirePackage{cmtiup}}{%
78 \ClassWarning{aomart}{The package mdputu is not found.\MessageBreak
79 You need this package to get italics with upright digits!}}
```

`\specialdigits` A legacy macro. We do not need it anymore.

```
80 \def\specialdigits{}%
81 \let\sishape=\itshape
82 \let\textsi=\textit
```

The *amsart* class defines several options for different font sizes (10pt, 11pt, etc). We have just one design size for the articles.

`\@typesizes` The font information in *amsart* is stored in `\@typesizes` macro. It has 11 type-sizes: 5 below and 5 above `\normalsize`.

```
83 \def\@typesizes{%
84 \or{\@vipt}{9}\or{\@vipt}{9}\or{\@viipt}{9}\or{\@ixpt}{12}%
```

```

85 \or{\@xpt}{13}%
86 \or{\@xipt}{14}% normalsize
87 \or{\@xiipt}{15}\or{13}{17}\or{\@xvipt}{20}%
88 \or{19}{23.2}\or{22}{27.8}}%
89 \normalsize \linespacing=\baselineskip

```

`\widebar` The functionality of `\widebar` coincides with that of `amsmath \overline`:

```

90 \let\widebar\overline

```

### 3.6 Page Dimensions and Paragraphing

`\textwidth` These are from the old `aomamlt2e`:

`\textheight`

```

91 \setlength{\textwidth}{31pc}
92 \setlength{\textheight}{48pc}

```

`\evensidemargin` The margins:

`\oddsidemargin`

```

93 \oddsidemargin=.65in
94 \evensidemargin=.65in

```

`\footins` Some skips from `aomamlt2e`:

`\topskip`

`\abovedisplayskip`

`\belowdisplayskip`

```

95 \setlength{\topskip}{12pt}
96 \setlength{\abovedisplayskip}{6.95pt plus3.5pt minus 3pt}
97 \setlength{\belowdisplayskip}{6.95pt plus4.5pt minus 3pt}
98 \setlength{\skip\footins}{20pt}
99 \setlength{\dimen\footins}{3in}

```

`\footskip` Some space for footnotes:

```

100 \setlength\footskip{30pt}

```

`\parskip` Paragraph shape:

`\parindent`

```

101 \setlength{\parindent}{22pt}
102 \setlength{\parskip}{\z@}

```

`\widowpenalty` We suppress widows and clubs:

`\clubpenalty`

```

103 \widowpenalty=10000
104 \clubpenalty=10000

```

### 3.7 Headers

`\headsep` Separation between the header and the body

```

105 \setlength{\headsep}{14pt}

```

`\headrulewidth` We do not want decorative rules in the journal:

`\footrulewidth`

```

106 \renewcommand{\headrulewidth}{0pt}
107 \renewcommand{\footrulewidth}{0pt}

```

`\@aom@linecount` This is the box displayed in the manuscript mode

```

108 \if@aom@manuscript@mode
109   \newsavebox{\@aom@linecount}
110   \savebox{\@aom@linecount}[4em][t]{\parbox[t]{4em}{\%
111     \@tempcnta\@ne\relax
112     \loop{\underline{\scriptsize\the\@tempcnta}}\%
113     \advance\@tempcnta by \@ne\ifnum\@tempcnta<43\repeat}}
114 \fi

```

It is easy to set up headers with fancyhdr:

```

115 \pagestyle{fancy}
116 \fancyhead{}
117 \fancyfoot{}
118 \fancyhead[CO]{\scriptsize\shorttitle}
119 \fancyhead[RO,LE]{\footnotesize\thepage}
120 \if@aom@manuscript@mode
121   \fancyhead[LE]{\footnotesize\thepage\begin{picture}(0,0)%
122     \put(-26,-25){\usebox{\@aom@linecount}}}%
123   \end{picture}}
124   \fancyhead[LO]{\begin{picture}(0,0)%
125     \put(-21,-25){\usebox{\@aom@linecount}}}%
126   \end{picture}}
127   \fancyfoot[C]{\scriptsize Proof: page numbers may be temporary}
128 \fi
129 \fancyhead[CE]{\scriptsize\MakeUppercase\shortauthors}

```

The first page has the special headers. The style `firstpage` is invoked by `amsart`; here we just redefine it.

```

130 \fancypagestyle{firstpage}{%
131   \fancyhf{}%
132   \if@aom@manuscript@mode
133     \lhead{\begin{picture}(0,0)%
134       \put(-21,-25){\usebox{\@aom@linecount}}}%
135     \end{picture}}
136   \fi
137   \chead{\scriptsize%
138     \href{\@annalsurl}{Annals of Mathematics} \textbf{\currentvolume}
139     (\currentyear),

```

We always print the starting page. However, we print the last page only if it does not coincide with the first page. There are two cases here: first, the last page may still be `\pageref{LastPage}`. In this case we need to extract the numerical value of the counter—note that `hyperref` is in action! Second, we could redefine the last page, and it is no longer `\pageref{LastPage}`. In this case we need to compare the value with the first page.

```

140   \start@page%
141   \def\tempa{\pageref{LastPage}}%
142   \edef\tempb{\start@page}%
143   \ifx\tempa\end@page
144     \edef\tempa{\HyPsd@@\pageref{LastPage}}%

```



```

145 \else
146 \edef\tempa{\end@page}%
147 \fi
148 \ifx\tempa\tempb\else--\end@page\fi\
149 \ifx\@doinumber\@empty\else
150 \edef\@doinumber{\@doinumber}%
151 \expandafter\doi\expandafter{\@doinumber}\fi}%
152 \cfoot{\footnotesize\thepage}}%

```

`\annalsurl` The command to set up the URL of the journal

```

153 \def\annalsurl#1{\gdef\@annalsurl{#1}}
154 \annalsurl{http://annals.math.princeton.edu/about}

```

### 3.8 Top Matter Macros

We make these macros allowed only in the preamble:

```

155 \@onlypreamble{\title}
156 \@onlypreamble{\author}
157 \@onlypreamble{\email}
158 \@onlypreamble{\address}
159 \@onlypreamble{\curraddr}
160 \@onlypreamble{\urladdr}
161 \@onlypreamble{\orcid}
162 \@onlypreamble{\givenname}
163 \@onlypreamble{\fulladdress}
164 \@onlypreamble{\surname}
165 \@onlypreamble{\thanks}
166 \@onlypreamble{\keyword}
167 \@onlypreamble{\subject}
168 \@onlypreamble{\received}
169 \@onlypreamble{\revised}
170 \@onlypreamble{\accepted}
171 \@onlypreamble{\published}
172 \@onlypreamble{\publishedonline}
173 \@onlypreamble{\proposed}
174 \@onlypreamble{\seconded}
175 \@onlypreamble{\corresponding}
176 \@onlypreamble{\editor}
177 \@onlypreamble{\version}
178 \@onlypreamble{\volumenumber}
179 \@onlypreamble{\issuenumber}
180 \@onlypreamble{\publicationyear}
181 \@onlypreamble{\copyrightnote}
182 \@onlypreamble{\copyrihyear}
183 \@onlypreamble{\papernumber}
184 \@onlypreamble{\startpage}
185 \@onlypreamble{\endpage}
186 \@onlypreamble{\doinumber}
187 \@onlypreamble{\mrnumber}

```

```

188 \@onlypreamble{\zblnumber}
189 \@onlypreamble{\arxivnumber}

```

Most top matter macros are defined in `amsart`. Here we just add some new macros and redefine some.

`\fulladdress` We store the information to output it later in the `rpi` file

```

\givenname 190 \def\@names{}
\surname 191 \def\givenname#1{\g@addto@macro\@names{givenname=#1;}}
192 \def\surname#1{\g@addto@macro\@names{surname=#1;}}
193 \def\fulladdress#1{\g@addto@macro\@names{fulladdress=#1;}}

```

`\author` We add mangling of `\@names` to the `amsart` macro

```

194 \renewcommand{\author}[2][]{%
195   \ifx\@empty\authors
196     \gdef\authors{#2}%
197     \g@addto@macro\@names{author=#2;}%
198   \else
199     \g@addto@macro\authors{\and#2}%
200     \g@addto@macro\@names{\and author=#2;}%
201     \g@addto@macro\addresses{\author{}}%
202   \fi
203   \@ifnotempty{#1}{%
204     \ifx\@empty\shortauthors
205       \gdef\shortauthors{#1}%
206     \else
207       \g@addto@macro\shortauthors{\and#1}%
208     \fi
209   }%
210 }
211 \edef\author{\@nx\@dblarg
212   \@xp\@nx\curname\string\author\endcsname}

```

`\email` We change `amsart` macro to output metadata

```

213 \renewcommand{\email}[2][]{%
214   \g@addto@macro\addresses{\email{#1}{#2}}%
215   \g@addto@macro\@names{email=#2;}%
216 }

```

`\urladdr` We change `amsart` macro to output metadata

```

217 \renewcommand{\urladdr}[2][]{%
218   \g@addto@macro\addresses{\urladdr{#1}{#2}}%
219   \g@addto@macro\@names{urladdr=#2;}%
220 }

```

`\orcid` Orcid also outputs metadata

```

221 \newcommand{\orcid}[2][]{%
222   \g@addto@macro\addresses{\orcid{#1}{#2}}%
223   \g@addto@macro\@names{orcid=#2;}%
224 }

```

`\keyword` Actually `amsart` has `\keywords` macro. It redefines `\@keywords`. Our macro adds to the stack instead.

```

225 \def\keyword#1{\ifx\@keywords\empty\gdef\@keywords{#1}\else
226   \g@addto@macro\@keywords{, #1}\fi}

```

`\subject` Subjects:

```

227 \let\@subjects\empty
228 \def\subject#1#2#3{\ifx\@subjects\empty\gdef\@subjects{#3}\else
229   \g@addto@macro\@subjects{, #3}\fi}

```

`\formatdate` This just sends the date to the special macro `\@formatdate`

```

230 \def\formatdate#1{\@formatdate#1\@endformatdate}

```

`\@formatdate` This macro takes date in the form YYYY-MM-DD and properly formats it. Note how we delete the leading zero in dates like April 02.

```

231 \def\@formatdate#1-#2-#3\@endformatdate{%
232   \@tempcnta=#3\relax
233   \ifcase#2\or
234     January\or February\or March\or April\or May\or June\or
235     July\or August\or September\or October\or November\or December\fi
236   \space\the\@tempcnta,\space#1}

```

`\received` The following macros add stuff to the footnotes material:

```

\revised 237 \def\received#1{\def\@received{#1}}
\accepted 238 \let\@received\empty
\published 239 \def\revised#1{\def\@revised{#1}}
\publishedonline 240 \let\@revised\empty
241 \def\accepted#1{\def\@accepted{#1}}
242 \let\@accepted\empty
243 \def\published#1{\def\@published{#1}}
244 \let\@published\empty
245 \def\publishedonline#1{\def\@publishedonline{#1}}
246 \let\@publishedonline\empty

```

The next macros mimic the functionality of `amsart \issueinfo` command. Note that `\issueinfo` still works.

`\volumenumber` This sets the volume of the paper

```

247 \def\volumenumber#1{\def\currentvolume{#1}}

```

`\issuenumber` This sets the issue of the paper:

```

248 \def\issuenumber#1{\def\currentissue{#1}}

```

`\publicationyear` This sets the year of the paper

```

249 \def\publicationyear#1{\def\currentyear{#1}}

```

`\papernumber` This is absent from the `\issueinfo`.

```

250 \def\papernumber#1{\def\currentpaper{#1}}
251 \papernumber{0000}

```

`\startpage` This defines the starting page of the paper. We have some nice features to set up roman page numbers for editorial stuff—probably not needed for this journal at this time...

```
252 \def\startpage#1{\pagenumbering{arabic}\setcounter{page}{#1}%
253 \def\start@page{#1}%
254 \ifnum\c@page<\z@ \pagenumbering{roman}\setcounter{page}{-#1}%
255 \def\start@page{\romannumeral#1}%
256 \fi}
```

`\endpage` This macro again has a twist in it: if the argument is not set, it calculates the last page number itself.

```
257 \def\endpage#1{\def\@tempa{#1}%
258 \ifx\@tempa\empty\def\end@page{\pageref{LastPage}}%
259 \else\def\end@page{#1}\fi}
```

`\pagespan` This macro is different from the one provided by `amsart` because we want to have the option of automatic calculation of the last page number.

```
260 \def\pagespan#1#2{\startpage{#1}\endpage{#2}}
261 \pagespan{1}{}
```

`\@getabstract` Amsart typesets the abstract in a box. We preserve this peculiarity, but we need to put abstract in a macro to output in the rpi file.

```
262 \long\def\@aom@abstract{}
263 \long\def\@getabstract#1{%
264 \long\gdef\@aom@abstract{#1}%
265 \ifx\maketitle\relax
266 \ClassWarning{aomart}{Abstract should precede
267 \protect\maketitle\space in AMS derived classes}%
268 \fi
269 \global\setbox\abstractbox=\vtop\bgroup%
270 \vglue1pc%
271 {\centering\normalfont\normalsize\bfseries\abstractname\par\vglue1pc}%
272 \list{}{\labelwidth\z@%
273 \leftmargin3pc \rightmargin\leftmargin%
274 \listparindent\normalparindent \itemindent\normalparindent%
275 \parsep\z@ \@plus\p@%
276 \let\fullwidthdisplay\relax%
277 }%
278 \item[]\normalfont\Small#1
279 \endlist\egroup}
```

`abstract` This puts abstract in a box *and* in a macro. Wasteful, but backward compatible

```
280 \renewenvironment{abstract}{\Collect@Body\@getabstract}{%
281 \ifx\@setabstract\relax\@setabstracta\fi}
```

`\proposed` We do not typeset the name of the proposer

```
282 \let\proposed\@gobble
```

`\seconded` Or the seconder  
283 `\let\seconded\@gobble`

`\corresponding` This is the corresponding author—again not typeset  
284 `\let\corresponding\@gobble`

`\version` We do not typeset the current version of the manuscript either...  
285 `\let\version\@gobble`

`\doinumber` Now databases' numbers of the article:  
`\mrnumber` 286 `\def\doinumber#1{\gdef\@doinumber{#1}}`  
`\zblnumber` 287 `\doinumber{10.4007/annals.\currentyear.\currentvolume.\currentissue.\currentpaper}`  
`\arxivnumber` 288 `\def\mrnumber#1{\gdef\@mrnumber{#1}}`  
289 `\mrnumber{}`  
290 `\def\zblnumber#1{\gdef\@zblnumber{#1}}`  
291 `\zblnumber{}`  
292 `\def\arxivnumber#1{\gdef\@arxivnumber{#1}}`  
293 `\arxivnumber{}`

`\copyrightyear` This is the copyright year in case it does not coincide with the publication year:  
294 `\def\copyrightyear#1{\def\@copyrightyear{#1}}`  
295 `\copyrightyear{}`

`\copyrightnote` This is the copyrightnote. The default has some trickery with the year:  
296 `\def\copyrightnote#1{\def\@copyrightnote{#1}}`  
297 `\copyrightnote{\textcopyright~%`  
298 `\ifx\@empty\@copyrightyear\currentyear\else\@copyrightyear\fi~%`  
299 `Department of Mathematics, Princeton University}`

### 3.9 Typesetting Top Matter

`\@mainrpi` We write the information about the paper into file.rpi (the The stream for the rpi file:  
300 `\newwrite\@mainrpi`

`\aom@write@paper@info` This writes the information about the paper into the file `jobname.rpi`. Note that hyperref makes our life a little bit more complex  
301 `\def\aom@write@paper@info{%`  
302 `\bgroup`  
303 `\if@filesw`  
304 `\openout\@mainrpi\jobname.rpi%`  
305 `\def\and{\string\and\space}%`  
306 `\ifx\r@LastPage\@undefined`  
307 `\edef\@tempa{\start@page}%`  
308 `\else`  
309 `\def\@tempc##1##2##3##4##5{##2}%`  
310 `\edef\@tempa{\expandafter\@tempc\r@LastPage}%`  
311 `\fi`

```

312 \protected@write\@mainrpi{}%
313 {\@percentchar authors=\authors}%
314 \protected@write\@mainrpi{}%
315 {\@percentchar authors.information={\@names}}%
316 \protected@write\@mainrpi{}%
317 {\@percentchar title=\@title}%
318 \protected@write\@mainrpi{}%
319 {\@percentchar year=\currentyear}%
320 \protected@write\@mainrpi{}%
321 {\@percentchar volume=\currentvolume}%
322 \protected@write\@mainrpi{}%
323 {\@percentchar issue=\currentissue}%
324 \protected@write\@mainrpi{}%
325 {\@percentchar paper=\currentpaper}%
326 \protected@write\@mainrpi{}%
327 {\@percentchar startpage=\start@page}%
328 \protected@write\@mainrpi{}%
329 {\@percentchar endpage=\@tempa}%
330 \protected@write\@mainrpi{}%
331 {\@percentchar doi=\@doinumber}%
332 \ifx\@zblnumber\@empty\else
333 \protected@write\@mainrpi{}%
334 {\@percentchar zbl=\@zblnumber}%
335 \fi
336 \ifx\@mrnumber\@empty\else
337 \protected@write\@mainrpi{}%
338 {\@percentchar mr=\@mrnumber}%
339 \fi
340 \ifx\@arxivnumber\@empty\else
341 \protected@write\@mainrpi{}%
342 {\@percentchar arxiv=\@arxivnumber}%
343 \fi
344 \protected@write\@mainrpi{}%
345 {\@percentchar subjects=\@subjects}%
346 \protected@write\@mainrpi{}%
347 {\@percentchar keywords=\@keywords}%
348 \protected@write\@mainrpi{}%
349 {\@percentchar abstract=\@aom@abstract}%
350 \closeout\@mainrpi
351 \fi
352 \egroup}

```

\@maketitle@hook We add writing the information to the hook:

```

353 \def\@maketitle@hook{\aom@write@paper@info\global\let\@maketitle@hook\@empty}

```

\@settitle We do not uppercase title. Also, we use this occasion to set PDF information:

```

354 \def\@settitle{\begin{center}%
355 \baselineskip20\p@\relax
356 \bfseries\LARGE
357 \@title

```

```

358 \ifpdf
359 \hypersetup{pdftitle=\@title}%
360 \fi
361 \end{center}%
362 }

```

`\@setauthors` Now we typeset authors according to our specs. Again, we use this occasion to set some PDF information:

```

363 \def\@setauthors{%
364 \ifx\authors\@empty\relax\else
365 \begingroup
366 \def\thanks{\protect\thanks@warning}%
367 \trivlist
368 \centering\footnotesize \@topsep30\p@\relax
369 \advance\@topsep by -\baselineskip
370 \item\relax
371 \def\@and{{\upshape \@om@and}}
372 \author@andify\authors
373 \ifpdf
374 \hypersetup{pdfauthor=\authors}%
375 \fi
376 \def\{\{\protect\linebreak}\}%
377 \small \@om@by{} \scshape\authors%
378 \ifx\@empty\contribs
379 \else
380 ,\penalty-3 \space \@setcontribs
381 \@closetoccontribs
382 \fi
383 \endtrivlist
384 \endgroup
385 \fi}

```

`\@setcontribs` Contributors are set up in the same way as authors:

```

386 \def\@setcontribs{%
387 \@xcontribs
388 {\scshape \xcontribs}%
389 }

```

`\@adminfootnotes` We do not typeset keywords, so we change the definition:

```

390 \def\@adminfootnotes{%
391 \let\@makefnmark\relax \let\@thefnmark\relax
392 \ifx\@empty\@date\else \@footnotetext{\@setdate}\fi
393 \ifx\@empty\@subjclass\else \@footnotetext{\@setsubjclass}\fi
394 \ifx\@empty\@keywords\else \@setkeywords\fi
395 \ifx\@empty\@subjects\else \@setsubjects\fi
396 \ifx\@empty\thankses\else \@footnotetext{%
397 \def\par{\let\par\@par}\@setthanks}%
398 \fi
399 \ifx\@empty\@copyrightnote\else \@footnotetext{%

```

```

400     \def\par{\let\par\@par}\@copyrightnote\@addpunct.}%
401   \fi
402 }

```

**\@setkeywords** Typesetting keywords

```

403 \def\@setkeywords{%
404   \ifpdf
405     \hypersetup{pdfkeywords=\@keywords}%
406   \fi
407   \if@aom@oldkeywords\else
408     \@footnotetext{Keywords: \@keywords}%
409   \fi
410 }

```

**\@setsubjects** Setting subjects

```

411 \def\@setsubjects{%
412   \ifpdf
413     \hypersetup{pdfsubject=\@subjects}%
414   \if@aom@oldkeywords\else
415     \@footnotetext{AMS Classification: \@subjects}%
416   \fi
417   \fi
418 }

```

**\@@and** We want “and” in the footers to be lowercase. Since there is some uppercase involved, we protect it:

```

419 \def\@@and{\MakeLowercase{\@aom@and}}

```

### 3.10 Typesetting End Matter

End matter is typeset at the end of the paper.

**\enddoc@text** This is the main macro for typesetting endmatter.

```

420 \def\enddoc@text{%
421   \ifx\@empty\@translators \else\@settranslators\fi
422   \ifx\@empty\@received \else\@setreceived\fi
423   \ifx\@empty\@revised \else\@setrevised\fi
424   \ifx\@empty\@addresses \else\@setaddresses\fi

```

**\@setreceived** A bunch of macros for setting centered dates

**\@setrevised** 425 \def\@setreceived{\centering(Received: \@received)\par}}

**\@setaccepted** 426 \def\@setrevised{\centering(Revised: \@revised)\par}}

**\@setpublished** 427 \def\@setaccepted{\centering(Accepted: \@accepted)\par}}

**\@setpublishedonline** 428 \def\@setpublished{\centering(Published: \@published)\par}}

429 \def\@setpublishedonline{\centering(Published online: \@publishedonline)\par}}

**\emailaddrname** We do not want the word “address” here:

```

430 \def\emailaddrname{\itshape E-mail}}

```



`\@setaddresses` The difference between our definition and the one in `amsart` is that we want the e-mail and URL to be clickable

```

431 \def\@setaddresses{\par
432   \nobreak \begingroup
433   \footnotesize
434   \def\author##1{\nobreak\addvspace\bigskipamount}%
435   \def\{\{\unskip, \ignorespaces}%
436   \interlinepenalty\@M
437   \def\address##1##2{\begingroup
438     \par\addvspace\bigskipamount\indent
439     \@ifnotempty{##1}{(\ignorespaces##1\unskip) }%
440     {\scshape\ignorespaces##2}\par\endgroup}%
441   \def\curraddr##1##2{\begingroup
442     \@ifnotempty{##2}{\nobreak\indent\curraddrname
443       \@ifnotempty{##1}{, \ignorespaces\scshape##1\unskip}\hskip0.2em:\space
444       \scshape##2\par}\endgroup}%
445   \def\email##1##2{\begingroup
446     \@ifnotempty{##2}{\nobreak\indent\emailaddrname
447       \@ifnotempty{##1}{, \ignorespaces##1\unskip}\hskip0.2em:\space
448       \href{mailto:##2}{\nolinkurl{##2}}\par}\endgroup}%
449   \def\urladdr##1##2{\begingroup
450     \@ifnotempty{##2}{\nobreak\indent
451       \@ifnotempty{##1}{, \ignorespaces##1\unskip}%
452       \url{##2}\par}\endgroup}%
453   \def\orcid##1##2{\begingroup
454     \@ifnotempty{##2}{\nobreak\indent
455       \@ifnotempty{##1}{, \ignorespaces##1\unskip}%
456       ORCID: ##2\par}\endgroup}%
457   \addresses
458   \endgroup
459 }
```

### 3.11 Sectioning

`\contentsnamefont` This is the font for the word “Contents”:

```

460 \renewcommand\contentsnamefont{\bfseries}
```

`\section` We want our sections to be centered and bold:

```

461 \def\section{\@startsection{section}{1}%
462   \z@{.7\linespacing\@plus\linespacing}{.5\linespacing}%
463   {\normalfont\bfseries\centering}}
```

`\subsection` We want our subsections to be indented and italic:

```

464 \def\subsection{\@startsection{subsection}{2}%
465   {\parindent}{.5\linespacing}{-.5em}%
466   {\normalfont\itshape}}
```

`\oldsubsections` This macro restores the values for `\subsection` spacing prior to v1.1.

```

467 \def\oldsubsections{%
468 \gdef\subsection{\@startsection{subsection}{2}%
469 {\parindent}{.5\linespacing\@plus.7\linespacing}{-.5em}%
470 {\normalfont\itshape}}

```

`\subsubsection` Subsubsections are formatted exactly like subsections:

```

471 \def\subsubsection{\@startsection{subsubsection}{3}%
472 {\parindent}{.5\linespacing}{-.5em}%
473 {\normalfont\itshape}}

```

`\Hy@AlphNoErr` The newer (circa 2012) hyperref defines this command. However, older versions do not. Here we provide it:

```

474 \providecommand\Hy@AlphNoErr[1]{%
475 \ifnum\value{#1}>26 %
476   Alph\number\value{#1}%
477 \else
478   \ifnum\value{#1}<1 %
479     Alph\number\value{#1}%
480   \else
481     \Alph{#1}%
482   \fi
483 \fi
484 }%

```

`\appendix` We redefine appendix to ensure the letter in section number is always upright:

```

485 \def\appendix{\par\c@section\z@ \c@subsection\z@
486 \gdef\theHsection{\Hy@AlphNoErr{section}}%
487 \let\sectionname\appendixname
488 \def\thesection{{\upshape\@Alph\c@section}}}

```

### 3.12 Figures and Tables

`\@captionheadfont` This is the font for the words “Figure” or “Table” in captions. Unlike `amsmath` with is small caps, we want just plain Roman font:

```

489 \def\@captionheadfont{\normalfont}

```

### 3.13 Theorems

Here we redefine three main style of `amsart`. Here are the arguments of `\newtheoremstyle` from [3]:

```

#1
\newtheoremstyle{NAME}%
#2 #3 #4
{ABOVESPACE}{BELOWSPACE}{BODYFONT}%
#5 #6 #7 #8
{INDENT}{HEADFONT}{HEADPUNCT}{HEADSPACE}%
#9
{CUSTOM-HEAD-SPEC}

```

In the `plain` style the name (“theorem”) is in small caps, the number is in normal font, the optional note is also in normal font, and the text is italics.

```
490 \newtheoremstyle{plain}{0.5\linespacing}{0.5\linespacing}{\sishape}%
491   {\parindent}{\scshape}{.}{0.5em}%
492   {\thmname{#1}\thmnumber{ #2}\thmnote{\normalfont{ } (#3)}}
```

In the `definition` style the name is italics, and the body font is upright:

```
493 \newtheoremstyle{definition}{0.5\linespacing}{0.5\linespacing}%
494   {\upshape}{\parindent}%
495   {\sishape}{.}{0.5em}%
496   {\thmname{#1}\thmnumber{ #2}\thmnote{\normalfont{ } (#3)}}
```

In our class there is no difference between `remark` and `definition` theorem styles:

```
497 \newtheoremstyle{remark}{0.5\linespacing}{0.5\linespacing}%
498   {\upshape}{\parindent}%
499   {\sishape}{.}{0.5em}%
500   {\thmname{#1}\thmnumber{ #2}\thmnote{\normalfont{ } (#3)}}
```

`\newtheorem` For compatibility reasons we need to accept `\newtheorem` with optional first argument—and silently drop it. The problem is, there is `\newtheorem*`, so we need to check which one we deal with... The command `\@xnthm` here is from `amsthm`; it does the real work with the real parameters.

```
501 \renewcommand{\newtheorem}{\@ifstar{\@aom@newthm@star}{\@aom@newthm}}
502 \def\@aom@newthm@star{\@ifnextchar[{\@aom@newthm@star@}{\@aom@newthm@star@[]}}
503 \def\@aom@newthm{\@ifnextchar[{\@aom@newthm@}{\@aom@newthm@[]}}
504 \def\@aom@newthm@star@[#1]{\@xnthm *}
505 \def\@aom@newthm@[#1]{\@xnthm \relax}
```

`proof` We want our proofs to be indented:

```
506 \renewenvironment{proof}[1][\proofname]{\par
507   \pushQED{\qed}%
508   \normalfont \topsep6\p@\@plus6\p@\relax
509   \trivlist
510   \item[\hskip\labelsep\hskip\parindent
511     \itshape
512     #1\@addpunct{.}]\ignorespaces
513 }{%
514   \popQED\endtrivlist\@endpefalse
515 }
```

### 3.14 Bibliography Macros

`\repeatedauthors` When the authors are repeated, we used change them to `\bysame`; we no more do this:

```
516 \def\repeatedauthors#1{\ClassWarning{aomart}{The command is obsolete}#1}
```

`\bysame` We no longer use `\bysame`

```
517 \let\bysame@@orig=\bysame
```

```

518 \def\bysame{\ClassWarning{aomart}{We no longer omit
519     repeated authors}\bysame@orig}

\doi    Typesetting doi...
520 \def\doi#1{%
521     \if@aom@doiMMXVI
522         \url{http://dx.doi.org/#1}%
523     \else
524         \if@aom@olddoi
525             \href{http://dx.doi.org/#1}{doi: \path{#1}}%
526         \else
527             \url{https://doi.org/#1}%
528         \fi
529     \fi}

\mr      Typesetting urls
\zbl 530 \def\mr#1{\href{http://www.ams.org/mathscinet-getitem?mr=#1}{MR~\path{#1}}}
\arxiv 531 \def\zbl#1{\href{http://www.zentralblatt-math.org/zmath/en/search/?q=an:#1}{Zbl~\path{#1}}}
\jfm 532 \def\arxiv#1{\href{http://www.arxiv.org/abs/#1}{arXiv~\path{#1}}}
533 \def\jfm#1{\href{http://www.emis.de/cgi-bin/JFM-item?#1}{JFM~\path{#1}}}

\bibliofont We make this \small rather than \Small in amsart
534 \renewcommand{\bibliofont}{\small}

```

### 3.15 Additional Macros

```

\EditorialComment This macro is noop in normal mode, but is a tiny marginpar in the manuscript
mode
535 \def\EditorialComment#1{\if@aom@manuscript@mode\bgroup
536     \marginparwidth=75pt\marginpar{\scriptsize\raggedright#1}\egroup\fi}

\@fullref This macro creates a wide link for the reference. It has four parameters: the
word (theorem, equation,...), the “pre” punctuation, the reference and the “post”
punctuation.
537 \def\@fullref#1#2#3#4{\hyperref[#3]{#1~#2\ref*{#3}#4}}

\fullref A reference without parentheses:
538 \newcommand{\fullref}[2]{\@fullref{#1}{#2}}

\pfullref A reference with parentheses:
539 \newcommand{\pfullref}[2]{\@fullref{#1}{(#2)}}

\bfullref A reference with brackets:
540 \newcommand{\bfullref}[2]{\@fullref{#1}{[#2]}}

\eqfullref Here we do not use the standard common \@fullref because we want \eqref to
work...
541 \newcommand{\eqfullref}[2]{\hyperref[#2]{#1~\textup{\tagform@{\ref*{#2}}}}}

```

`\eqnarray` While we do *not* recommend the use of `eqnarray`, we still would like to correct the ugly spacing around it...

```

542 \def\eqnarray{%
543   \stepcounter{equation}%
544   \def\@currentlabel{\p@equation\theequation}%
545   \global\@eqnswtrue
546   \m@th
547   \global\@eqcnt\z@
548   \tabskip\@centering
549   \let\\\@eqnocr
550   $$\arraycolsep1\p@
551   \everycr{}\halign to\displaywidth\bgroup
552     \hskip\@centering$\displaystyle\tabskip\z@skip{##}$\@eqnse1
553     &\global\@eqcnt\@ne\hskip \tw@\arraycolsep \hfil${##}$\hfil
554     &\global\@eqcnt\tw@ \hskip \tw@\arraycolsep
555     $\displaystyle{##}$\hfil\tabskip\@centering
556     &\global\@eqcnt\thr@@ \hb@xt@\z@\bgroup\hss##\egroup
557     \tabskip\z@skip
558   \cr
559 }
```

### 3.16 End of Class

```

560 \endclass
```

## References

- [1] George Grätzer. *Math into L<sup>A</sup>T<sub>E</sub>X*. Birkhäuser, Boston, third edition, 2000.
- [2] UK T<sub>E</sub>X Users Group. UK list of T<sub>E</sub>X frequently asked questions. <http://www.tex.ac.uk/cgi-bin/texfaq2html>, 2008.
- [3] Michael Downes and Barbara Beeton. *The amsart, amsproc, and amsbook document classes*. American Mathematical Society, August 2004. <http://mirrors.ctan.org/macros/latex/required/amslatex/classes>.
- [4] Sebastian Rahtz and Heiko Oberdiek. *Hypertext Marks in L<sup>A</sup>T<sub>E</sub>X: a Manual for Hyperref*, September 2006. <http://mirrors.ctan.org/macros/latex/contrib/hyperref>.
- [5] Heiko Oberdiek. *The ifpdf Package*, February 2006. <http://mirrors.ctan.org/macros/latex/contrib/oberdiek>.
- [6] Piet van Oostrum. *Page Layout in L<sup>A</sup>T<sub>E</sub>X*, March 2004. <http://mirrors.ctan.org/macros/latex/contrib/fancyhdr>.
- [7] Sergei V. Znamenskii. *Unslanted Punctuation in Computer Modern Italic*, January 2003. <http://mirrors.ctan.org/fonts/cm/cmertiup>.
- [8] Yannis Haralambous. *My Humble Additions to (La)T<sub>E</sub>X Mathematics*, January 1996. <http://mirrors.ctan.org/macros/latex/contrib/yhmath/>.
- [9] American Mathematical Society. *User's Guide for the amsmath Package (Version 2.0)*, February 2002. <http://mirrors.ctan.org/macros/latex/required/amslatex/math/amslatex.pdf>.
- [10] Johannes Braams. *Babel, a Multilingual Package For Use With L<sup>A</sup>T<sub>E</sub>X's Standard Document Classes*, April 2005. <http://mirrors.ctan.org/macros/latex/required/babel>.
- [11] American Mathematical Society. *Instructions for Preparation of Papers and Monographs, AMSL<sup>A</sup>T<sub>E</sub>X*, August 2004. <http://mirrors.ctan.org/macros/latex/required/amslatex/classes/instr-1.pdf>.
- [12] American Mathematical Society. *Using the amsthm Package*, August 2004. <http://mirrors.ctan.org/macros/latex/required/amslatex/classes/amsthdoc.pdf>.
- [13] Michel Goossens, Sebastian Rahtz, and Frank Mittelbach. *The L<sup>A</sup>T<sub>E</sub>X Graphics Companion: Illustrating Documents With T<sub>E</sub>X and PostScript*. Addison-Wesley Series on Tools and Techniques for Computer Typesetting. Addison-Wesley, Reading, Ma., 1997.

## Change History

v0.10		\@setaddresses: Deleted the word	
\if@aom@screen@mode: Added		URL . . . . .	25
screen mode . . . . .	13	E-mail is now in Roman font . .	25
\jfm: Added macro . . . . .	28	\@setpublishedonline: Decreased	
General: Bibliography styles		font . . . . .	24
update . . . . .	2	\@typesizes: Corrected typo in	
Documentation update . . . . .	2	the definition of Small . . . . .	14
Screen mode triggers special		Increased LARGE from 16 pt to	
URL settings . . . . .	13	17 pt . . . . .	14
v0.2		\bfullref: Added macro . . . . .	28
General: First fully functional		\emailaddrname: Changed macro	24
version . . . . .	2	\eqfullref: Added macro . . . . .	28
v0.3		\fullref: Added macro . . . . .	28
\EditorialComment: Added macro	28	\pfullref: Added macro . . . . .	28
\arxiv: Added macro . . . . .	28	\subsection: Redefined macro . .	25
\corresponding: Added macro . .	21	General: Added extra footer in	
\doinumber: Added macro . . . . .	21	manuscript mode . . . . .	16
\if@aom@manuscript@mode: Added		Corrected the byg with math in	
manuscript mode . . . . .	12	headers . . . . .	16
\mr: Added macro . . . . .	28	Made remark theorem style	
\mrnumber: Added macro . . . . .	21	identical to definition theorem	
\newtheorem: Redefined macro . .	27	style . . . . .	27
\proposed: Added macro . . . . .	20	Made Roman font the default	
\seconded: Added macro . . . . .	21	URL font . . . . .	13
\version: Added macro . . . . .	21	proof: Redefined macro . . . . .	27
\zbl: Added macro . . . . .	28	v0.6	
\zblnumber: Added macro . . . . .	21	\@setauthors: 'By' and 'and' are	
General: Added DOI number in		in Roman font now . . . . .	23
headers . . . . .	16	\belowdisplayskip: Changed	
Added package mdputu . . . . .	14	belowdisplayskip . . . . .	15
Documentation update . . . . .	2	\biblio font: Changed default . .	28
v0.4		\zbl: Changed capitalization . . .	28
\@aom@linecount: Added macro . .	16	General: Changes to bst files . . . .	2
\enddoc@text: Deleted many		Fullref.pl is much less aggressive	
dates. . . . .	24	now . . . . .	2
General: Changed definition		v0.7	
theorem style . . . . .	27	General: Bibliography styles	
Changed plain theorem style . .	27	changed . . . . .	2
Deleted lineno package		v0.8	
dependence . . . . .	14	\specialdigits: Redefined to	
Deleted remark theorem style . .	27	noop . . . . .	14
Documentation update . . . . .	2	General: Added yhmth . . . . .	14
Switched to upright digits in		Bibliography styles update . . . .	2
italics everywhere . . . . .	14	Changed authors in header . . . .	16
Used line numbers for headings	16	Documentation update . . . . .	2
v0.5		Switched to cmtiup . . . . .	14
\@fullref: Added macro . . . . .	28		

v0.9	Deleted \repeatedauthors from the documentation . . . . .	2
\@@and: Redefined macro . . . . .		24
\@setaddresses: Deleted spurious space in urladdress . . . . .		25
\@setpublishedonline: Increased font . . . . .		24
\eqnarray: Redefined standard macro . . . . .		29
General: Bibliography styles update . . . . .		2
Changed font for the folio on the first page . . . . .		16
Documentation update . . . . .		2
abstract: Added parindent for the first par . . . . .		20
v1.0	\doinumber: Added default . . . . .	21
\papernumber: Added macro . . . . .		19
General: Top matter macros are now only in preamble . . . . .		2
v1.1	General: In manuscript mode the links are always blue . . . . .	13
v1.10	\@@and: Added internationalization . . . . .	24
\@aom@and: Added macro . . . . .		14
\@aom@by: Added macro . . . . .		14
\@setauthors: Internationalization . . . . .		23
\doi: Introduced the logic for old doi formatting . . . . .		28
\if@aom@olddoi: Added old DOI processing . . . . .		13
v1.11	\@adminfootnotes: Added copyright statement . . . . .	23
\@setaddresses: Changed email handling . . . . .		25
\bysame: Made the macro obsolete . . . . .		27
\copyrightnote: Added macro . . . . .		21
\copyrightyear: Added macro . . . . .		21
\fulladdress: Added macro . . . . .		18
\repeatedauthors: Now this command is obsolete . . . . .		27
General: Added \fulladdress . . . . .		2
Added new commands for copyright statement . . . . .		2
Bibliography change: titlenote, deleted bysame . . . . .		2
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Corrected the endpage bug . . . . .		21
\arxivnumber: Added macro . . . . .		21
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\email: Redefined amsart definition . . . . .		18
\fulladdress: Redefined . . . . .		18
\givenname: Redefined . . . . .		18
\surname: Redefined . . . . .		18
\urladdr: Redefined amsart definition . . . . .		18
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abstract: Redefined using environ . . . . .		20
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\@setsubjects: Now we print subjects . . . . .		24



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