

A GUIDE FOR AUTHORS PREPARING THEIR ACCEPTED MANUSCRIPT FOR PMIHÉS

With almost every commands and tricks available for our class

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“When a mystery is too overpowering, one dare not disobey. Absurd as it might seem to me, a thousand miles from any human habitation and in danger of death, I took out of my pocket a sheet of paper and my fountain pen.”

Antoine de Saint-Exupéry, *The Little Prince*, 1943
(translated by Katherine Woods)

ABSTRACT

Here is the abstract in English. Abstracts should stand on their own, and not contain any bibliographical reference.

RÉSUMÉ

Ceci est le résumé français. Les résumés doivent être compréhensibles hors contexte, et donc ne pas contenir de références bibliographiques.

The aim of this document is to be at the same time a manual and a sample of a `.tex` file prepared in the class `mersenne.cls` for submissions accepted for publication. The class `mersenne` uses `amsart.cls`, and implements (among other things) the layout of the journal. Therefore all authors already at ease with the classes of the AMS should find it easy to adapt their source to `mersenne.cls`. It should be noted that the `amsthm`, `amsmath`, and `amsfont` packages are loaded by `amsart` and therefore by `mersenne`, and that the `amscd` and `amssymb` packages are compatible but not loaded by default.

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To compile this document (and later your article based on the same class), the easiest way is to use LaTeXmk, either within your L^AT_EX environment or on the command line as

```
latexmk -pdf sample.tex
```

which will take care of running pdf_latex, bib_tex and the rest as many times as needed.

1. Preamble

1.1. Metadata. — As you can see in the source file of this document, all “metadata” like keywords, subject numbers, authors, affiliations, email (and url) should be in the relevant field. Have a look at this document’s preamble (including the comments) for more details, it has been overloaded for this purpose. Do note that unused fields should be removed instead of simply left empty. E.g. if an author has no middle name, `\middlename{}` should be removed.

1.2. Packages and commands. — Since many commands are defined in our class file, and since it is important that the result of compiling each article is uniform, we ask all authors to refrain from using `\let` and `\renewcommand` in the preamble. Likewise, every command or package which might modify the general layout, like `\setlength` or `{fourier}` or the like should be avoided. Unused commands and packages should also be commented/removed, as they can still affect the compilation.

2. Theorems and theorem-like environments

In order to maintain uniformity about labelling and numbering of theorems and theorem-like environments, many environments are already defined by the class. This means that, unlike what you might be used to doing, you *should not* insert a list of commands like

```
\theoremstyle{plain}
\newtheorem{theorem}{Theorem}
\newtheorem{lemma}{Lemma}
...
\theoremstyle{remark}
\newtheorem{remark}{Remark}
```

at the beginning of the file. But most probably in your document you have already a bunch of occurrences of

```
\begin{thm}
  If  $xyz=0$  and  $x \neq 0$  and  $y \neq 0$  then  $z=0$ .
\end{thm}
```

and we are going to discuss how you can adapt your source file. The list of all environments which are defined in the class is in Section 2.1 below.

- (1) If the kind of environment (say, Proposition) already exists in the class and has the same name as in your file (in this case `prop` or `proposition`), then you don't have to do anything, and the outcomes will be as intended:

Proposition 2.1. — A statement.

- (2) If, for instance, you called your Theorem environment `satz`, so that a typical command in your source file is

```
\begin{satz}
  This template will prove useful.
\end{satz}
```

then you will receive an error. In this case you should replace the line in your preamble which reads

```
\newtheorem{satz}{Theorem}

or

\newtheorem{satz}{Theorem}[section]

or
```

```
\newtheorem{satz}[lemma]{Theorem}
```

simply by the line

```
\equalenv{satz}{theo}
```

where the first argument is the name *you* gave to the environment, and the second is the name of the environment in the class (see Section 2.1).

Alternatively, you can also replace all the `\begin{satz}... \end{satz}` by `\begin{theo}... \end{theo}`, which does exactly the same thing.

- (3) If you want to use an environment which does not belong to the list in Section 2.1 (say, for instance, that you want an environment `Subsublemma`, called by the command `\begin{sslemma}`) you need to modify the definition so that it reads

```
\theoremstyle{plain} % or {remark}
\newtheorem{sslemma}[allthms]{Subsublemma}
```

A `subsublemma` will then look like this:

Subsublemma 2.2. — It works.

It also uses the same counter `allthms` as the others theorems.

Alternatively, if your environment is only used a few times, you can instead use the environment `enonce` (or its unnumbered version `enonce*`) to define it only *locally*. For instance,

```
\begin{enonce*}{Main Theorem}
The main (unnumbered) statement of this article.
\end{enonce*}
%
\begin{enonce}[remark]{Notation-Convention}
This is in the remark style, and it follows
the allthms numbering.
\end{enonce}
```

which produces

Main Theorem. — *The main (unnumbered) statement of this article.*

Notation-Convention 2.3. — This is in the remark style, and it follows the allthms numbering.

- (4) If you want to restate a theorem already stated, please do not use the package `thmthools` as it will create conflicts. Instead, you can use `enonce*` as described in (3) with the reference to the original theorem for its name, and paste the original text: this permits in particular to modify the original text, which can be useful but is to be used with caution. For instance, we use it to restate Proposition 2.1, which was first stated on the previous page.

Let us now recall our key proposition, by typing

```
\begin{enonce*}{Proposition~\ref{prop:1}}
A statement.
\end{enonce*}
```

which produces

Proposition 2.1. — *A statement.*

Finally, of course, it is highly recommended that you either delete or at least comment out all of your definitions which fall into categories (1) and (2).

2.1. Mersenne’s theorems environments. — All theorems share a single counter, which is relative to the section number (so that the first theorem of Section 5 would be Theorem 5.1). The rationale of the naming scheme is to use the 4 first letters of the English label, adding a “s” in a few cases. The printed labels will change automatically

with the language set in the `\documentclass`. Some theorems already have aliases, created using `\equalenv` in our class files.

English label	environment name	style
Theorem	<code>theo</code> <i>aliases:</i> <code>thm</code> , <code>theorem</code>	plain
Corollary	<code>coro</code> <i>alias:</i> <code>corollary</code>	plain
Proposition	<code>prop</code> <i>alias:</i> <code>proposition</code>	plain
Lemma	<code>lemm</code> <i>alias:</i> <code>lemma</code>	plain
Conjecture	<code>conj</code> <i>alias:</i> <code>conjecture</code>	plain
Definition	<code>defi</code> <i>alias:</i> <code>definition</code>	plain
Question	<code>ques</code>	plain
Remark	<code>rema</code> <i>alias:</i> <code>remark</code>	remark
Remarks	<code>remas</code>	remark
Notation	<code>nota</code>	remark
Notations	<code>notas</code>	remark
Example	<code>exam</code>	remark
Examples	<code>exams</code>	remark

All the “4 letters” theorems have an unnumbered version (e.g. `theo*`), a “cut” version with no “`. —`” for theorems starting with a list or equation (e.g. `theoc`), and a unnumbered cut version (e.g. `theoc*`). Those variantes only exist for the “4 letters” names, not for the aliases; there is no `thm*`.

Theorem 2.4. — Theorems, Propositions, Lemmas, Corollaries, Definitions, Questions and Conjectures look like this: italic heading, bold upright counter, italic text.

Remark 2.5. — Remarks, Notations and Examples look like this: italic heading, bold upright counter, upright text.

Remark (Optional argument). — All theorems can have an optional argument. Be mindful that you need to protect any closing square bracket in the argument, as it will be otherwise interpreted as the end of the argument.

E.g. `\begin{theo}[see~{\cite[Thm. 9.5]{Ser98}}]`.

3. Figures

If you want to insert figures, you should resize them in a way that they don’t creep into the margins (and this, after having checked that `geometry` is disabled and that you are not using a smaller font or larger margins, otherwise they won’t creep into *your* margins but will in PMIHÉS’s). If this is not possible, you should rotate them so that they appear



FIGURE 1. — A figure. Note that the caption of a figure should be below the image(s), while the caption of a table should be above its content.

in landscape mode. It is important to insert figures in a figure environment, by using `\begin{figure}` and `\end{figure}`. This allows you, on a one hand, to add a caption and to get the figure numbers, so that you can insert a `\label{fig:mynicefigure}` and refer to it. What is more important, it allows the figure to *float*, so to move around for best typographical results. It is not a good practice, in general, to force \LaTeX to insert figures *precisely* where you want, so please refrain from adding the option `[H]` which forces \LaTeX to do so: some fine-tuning of figures placement can be discussed at a later stage of production. These advices also applies to tables and algorithms.

4. Miscellaneous \TeX hints

We gather here some hints which might be useful when preparing your article.

- the package `amsmath`, which is automatically loaded, provides the command `\eqref{}` which has the advantage of automatically inserting parenthesis around the number generated by `\ref{}`. So, `\eqref{local.lemma}` is preferred to `(\ref{local.lemma})`.
- \LaTeX commands and mathematical symbols in titles should be endowed with a plain text replacement for the PDF reader, to be displayed correctly in the reader's index. We use the command `texorpdfstring`, which takes the usual command as its first argument, and a plain text substitution for the PDF reader. For instance, the title of this section was typeset as

```
\section{\texorpdfstring{Miscellaneous \TeX\ }{\TeX }hints}
```

- As a last hint, let us stress once more that \TeX does an excellent job in placing spaces and organizing layout, so each time you use a spacing-command like `\;` or `\medskip` please double-check that this is a good idea. This applies in particular to figures, cf. Section 3. On the other hand, since it is allowed to go at the line when it considers it useful, it is good practice to use `~` before a digit, a

single mathematical symbol, or a reference, in order to avoid having the symbol go on a line all alone: so, write

we let k be the unique even prime number.

5. The bibliography

The bibliography style used for PMIHÉS is `pmihesplain`. All authors are asked to prepare their bibliography in a *separate* .bib file. If your file is called `mynicebib.bib` then you should put this file in the same folder as the .tex file and finish your document with the lines

```
\bibliography{mynicebib}
\end{document}
```

which is precisely the way this very sample file finishes. Of course, you will need to upload the .bib file along with the .tex for our production. Please try to keep your .bib file as simple as possible. You can clean it using programs such as `bibttool` in order to remove unused entries. Do not use the `\bibliographystyle` command as it is already contained in the class.

Creating the .bib file is quite standard; one easy way of doing so is by choosing your favourite database (for example MathSciNet or Zentralblatt) and find the `bibtex` string corresponding to the work you want to quote: then, copy-paste it. Here, some remarks are in order. First of all, the `\note{}` field is sometimes abusively used by these databases. For instance, the `bibtex` entry for Matoušek's *Thirty-three miniatures* reads

```
@book{Mat10Wrong,
  AUTHOR = {Matoušek, Jiří},
  TITLE = {Thirty-three miniatures},
  SERIES = {Student Mathematical Library},
  VOLUME = {53},
  NOTE = {Mathematical and algorithmic applications
    of linear algebra},
  PUBLISHER = {American Mathematical Society, Providence, RI},
  YEAR = {2010},
  PAGES = {x+182},
  ISBN = {978-0-8218-4977-4},
  MRCLASS = {15-01 (05A10 05C70)},
  MRNUMBER = {2656313},
  MRREVIEWER = {Torsten Sander},
  DOI = {10.1090/stml/053},
  URL = {https://doi.org/10.1090/stml/053},
}
```

and you can easily find what went wrong by looking at the entry [9] in the bibliography of this file. The entry [10] is correct, and it is typeset as follows (note that the accents were also changed to follow the BibTeX syntax):

```
@book{Mat10Right,
  AUTHOR = {Matou{\v s}ek, Ji{\v r}{\'{i}}},
  TITLE = {Thirty-three miniatures. {M}athematical and
    algorithmic applications of linear algebra},
  SERIES = {Student Mathematical Library},
  VOLUME = {53},
  PUBLISHER = {American Mathematical Society, Providence, RI},
  YEAR = {2010},
  PAGES = {x+182},
  ISBN = {978-0-8218-4977-4},
  MRNUMBER = {2656313},
  DOI = {10.1090/stml/053},
}
```

Another reference for a book is [4], an example for a journal article is [14] and an example for a doctoral thesis is [18].

Speaking about bibliography, you could look at how the entry [5] is typeset in the `sample.bib` file; it gives instruction on how to obtain upper-case and accents, because if you simply write in a bibliographical entry

```
title={Moderate deviations of subgraph counts in the
  Erd\H{o}s-R{\'}{e}nyi random graphs  $\{G(n,m)\}$ 
  and  $\{G(n,p)\}$ },
```

the result will be

Moderate deviations of subgraph counts in the erdős-rényi random graphs $G(n,m)$ and $G(n,p)$.

We stress here that our policy is that, as in the title, we prefer all common English nouns to be lower-case even if in the original title the author or publisher followed a different style, as for reference [2].

Another useful command is the field `eprint`: you can see it in action in reference [2]. The entry, which is “only” an arXiv submission, was typeset (in the `.bib` file, as usual!) as

```
@unpublished{Bab15,
  author = {Babai, L\{'{a}szl\{'{o}}},
  title = {Graph isomorphism in quasipolynomial time},
  year = {2015},
  eprint = {1512.03547}
}
```


(you can check it by yourself in the `sample.bib` file) so that you see what `eprint` does. On a one hand, it prepends `https://arxiv.org/abs/` to the reference number (which was the only typeset argument) and, on the other, it creates a clickable link. In case the repository hosting the preprint is not the arXiv, you need to specify the prefix of the repository with `archiveprefix = {}` (this will replace the url of the arXiv with that of the repository). You can also use `archive = {}` for providing a repository name, but this is not displayed in the reference list. For instance, reference [3] was typeset as

```
@unpublished{BHLM07,
  TITLE = {Algorithmic aspects of a general modular
           decomposition theory},
  AUTHOR = {Bui-Xuan, Binh-Minh and Habib, Michel
           and Limouzy, Vincent and de Montgolfier, Fabien},
  year = {2007},
  eprint = {hal-00111235v2},
  archiveprefix = {HAL},
  archive = {https://hal.archives-ouvertes.fr}
}
```

For all electronic resources that have a url but don't belong to any "repository" like the arXiv or HAL (for which the previous paragraph applies), the two useful fields `url` and `urldate` are available. Their aim should be self-explanatory: for instance, the entry [6] referring to a paper available on MathOverflow was typeset as

```
@unpublished{Ham10,
  title = {What is the minimal size of a partial order that
           is universal for all partial orders of size  $n^{k?}$ },
  author = {Joel David Hamkins},
  date = {2010-05-25},
  howpublished = {MathOverflow},
  url = {https://mathoverflow.net/q/25874},
  urldate = {2024-01-26},
  year={2010},
}
```

In a reference with type `@article`, `@inproceedings` or `@incollection` (which serves to cite an article within a book, e.g. [1]), the field `doi` has priority over `url`. In other words, `url` is printed only if `doi` is not filled. For instance, both fields are filled in reference [12], while only the field `url` is filled in reference [8].

Finally, there is a trend in electronic publishing to endow papers with a unique ID rather than continuous page numbering to precisely locate papers within a journal. This is handled through the field `eid`, with the possible addition of the `pagetotal` field. The field `pages` should not be used for these papers. See entry `MoTa10` in the file `sample.bib` and [11].

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