North-Western European Journal of Mathematics

Documentation of the LaTeX class of *North-Western European Journal of Mathematics* for authors

Version 1.0.5 as of September 21, 2022

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Contents

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1 Introduction

Remark 1.1 – Documentation: work in progress

This documentation is a work in progress. Readers finding errors or with comments are invited to send them via the email address on the title page.

Warning 1.1 – Class to be used

The North-Western European Journal of Mathematics (NWEJM) provides two LaTeX classes:

1. The nwejm class designed for entire issues of the journal, and thus intended for the *NWEJM* managing team (and not for authors of articles);
2. The nwejmart class for authors of articles to be published in NWEJM.

Authors of articles should therefore take care to use the nwejmart class and *not* the nwejm class.

Warning 1.2 – Required packages

In order to use the nwejmart class, it is necessary to have:

- A reasonably recent TeX distribution;
- The biblatex package;
- The `biber`[a] program.

With Ubuntu for example, if TeX Live is installed via the GNU/Linux distribution packages, those named texlive-bibtex-extra and biber are required.

[a] Attention! The bibliography must be compiled not with the usual `bibtex`, but with `biber`. More details in warning 3.3 on p. 8 and Section 7 on p. 11.

The LaTeX class nwejmart is intended for authors wishing to publish an article in NWEJM. The purpose of this class is:

1. To accurately reproduce the *NWEJM*'s layout, allowing thus authors to work on the layout of their document under real conditions;

2. To provide some tools (commands et environments) to facilitate the writing of documents, especially those containing mathematics.

Warning 1.3 – `UTF-8` input encoding required

The nwejmart class of *NWEJM* relies crucially on `UTF-8` input encoding:
- It loads the inputenc package[a] with the `utf8` option;
- It assumes that `.tex` source files are indeed encoded in `UTF-8`: make sure that your computer editor is correctly set for this input encoding.

[a] It is therefore advisable *not* to load this package: see Appendix A on p. 39 for an outline of the source file for *NWEJM* and in particular for a typical preamble.

Warning 1.4 – Format and pdfLaTeX compilation

The composition of the *North-Western European Journal of Mathematics* volumes involves:
- The LaTeX format[a]. Commands of other formats such as plain TeX should therefore be avoided;
- The preferred compiler is pdfLaTeX. In particular, as the LaTeX is not used *a priori*, we prefer:
  1. JPG, PNG et PDF[b] as image formats;
  2. Avoid `PostScript` code, especially via `PSTricks`, and use the TikZ package as drawing tool for instance.

[a] In its LaTeX 2_ε version, the most common today.
[b] The recommended format is PDF since it is vector-based so that the quality of the images is not degraded by resizing.

2 Article's configuration

2.1 Language

The *NWEJM* accepts articles in four languages:

- English
- French
- German
- Dutch

and the nwejmart class allows to specify the language[3] by using the following classes.

`english` (no value, default option)

[3] The language is managed underhand by the babel package.

This option sets English as article language.

`french` (no value)

This option sets French as article language.

`german` (no value)

This option sets German as article language. It as `ngerman` as alias.

Remark 2.1 – babel option underlying the `german` option

The `german` language option of nwejmart class calls underhand the `ngerman` option of babel package.

`dutch` (no value)

This option sets Dutch as article language.

Remark 2.2 – Default article language

If none of these options are specified, the default language is English.

2.2 Other configurations

`\articlesetup{`⟨*options*⟩`}`

This command allows you to configure the ⟨*options*⟩ of the current article in key/value form.
The only key provided for the time being is `gradient`.

`gradient=grad|nabla` (no default value, initially `grad`)

This key allows you to specify how the gradient is displayed using the command `\grad`→ p. 20.

Warning 2.1 – `\articlesetup` command: not in the preamble!

The`\articlesetup` command must be *exclusively* used in the body of the document (preferably just after `\begin{document}`), otherwise the chosen configuration, although taken into account in the article alone, may not be taken into account in the complete volume!

3 Preparing the article “title”

This section lists commands, options and environment for *preparing* the “title” of the article and its possible final part.

3.1 Title, subtitle

New: 2017-10-23

`\title[⟨alternative title toc⟩][⟨header alternative title⟩]{⟨title⟩}`

This command defines for the current article:

- Its ⟨*title*⟩ on the first page;
- Its *possible* ⟨*alternative title toc*⟩ listed in:
  - The volume in which the article will be published:
    - In the table of contents (TOC);
    - In the bookmarks;
  - In the PDF file of the stand-alone article, in the “Title” metadata;
- Its *possible* ⟨*header alternative title*⟩ as a header[4] on even-numbered pages.

The precise use of this command is summarized in Table 1.

Table 1 – Using the `\title` command (with two optional arguments)

	first page	TOC	header
`\title{`⟨*title*⟩`}`	⟨*title*⟩		
`\title[`⟨*alt. toc*⟩`]{`⟨*titre*⟩`}`	⟨*title*⟩	⟨*alt. toc*⟩	
`\title[][`⟨*alt. header*⟩`]{`⟨*title*⟩`}`	⟨*title*⟩		⟨*alt. header*⟩
`\title[`⟨*alt. toc*⟩`][`⟨*alt. header*⟩`]{`⟨*titre*⟩`}`	⟨*title*⟩	⟨*alt. toc*⟩	⟨*alt. header*⟩

`\subtitle[⟨alternative subtitle toc⟩]{⟨subtitle⟩}`

This command defines *if needed*, for the current article:

- Its ⟨*subtitle*⟩ following the ⟨*title*⟩ on the first page;
- Its *possible* ⟨*alternative subtitle toc*⟩ following the ⟨*title*⟩[5] :
  - In the issue where the article will be published:
    - In the TOC;
    - In the bookmarks;
  - In the PDF file of the stand-alone, in the “Title” metadata.

```
\title[Treatise on Probability Calculus]{Treatise on Probability
    Calculus and its Applications}
\subtitle[Scope and limits of a Borelian project]{Scope and limits
```

[4] I.e. in current title.
[5] Or possible ⟨*alternative title toc*⟩.

```
    of a large-scale Borelian project (1921-1939)}
```

Remark 3.1 – Displaying titles ansd subtitles

In order to display the title and subtitle, it is necessary use the usual command `\maketitle` → p. 9.

3.2 Author(s)

An article author is specified by means of the `\author` command. In case of mutliple authors, it suffices to use several instances of the command.

`\author[⟨options⟩]{⟨Last name⟩, ⟨First name⟩}`

This optional command defines an article author.

Warning 3.1 – Format of the author’s first and last name

Care should be taken to ensure that:

1. The entry of the author’s first and last name has the right syntax (identical to the one for BibTeX and biblatex):

   ⟨Last Name⟩, ⟨First name⟩

2. Any diacritical characters (accents, ...) are included in the ⟨First name⟩ et ⟨Last name⟩ ;
3. The ⟨Last name⟩ be *not* entered in upper case (except for the capital letter(s))[a].

The “Author” metadata of the generated PDF file automatically contains the specified author(s).

[a] In French articles, this name will automatically be written in small capitals.

The `\author` command admits an optional argument to specify the author’s affiliation(s) with one of the `affiliation` and `affiliationtagged` → p. 8 keys.

`affiliation=[⟨tag⟩]{⟨affiliation⟩}` (no default value, initially empty)

This key is used to define a (unique) ⟨affiliation⟩. For an author with several affiliation, this key is used as many times as necessary.
In addition, each affiliation can take a ⟨tag⟩ for reuse by another author.

`affiliationtagged={`⟨*tag*⟩`}` (no default value, initially empty)

This key allows you to specify a (unique) affiliation already defined and tagged for a previous author.

```
\author[
  affiliation={Laboratoire \textsc{sphere}, Universit\'e Paris
    Diderot}
  ]{Bustamante, Martha-Cecilia}
\author[
  affiliation=[aff2]{\textsc{lpma}, Universit\'e Pierre et Marie
    Curie},
  affiliation={\textsc{ghdso}, Universit\'e Paris-Sud}]{Cl\'ery,
    Matthias}
\author[
  affiliationtagged={aff2}
]{Mazliak, Laurent}
```

Warning 3.2 – Brace pairs

In the presence of commas in the ⟨*affiliation*⟩ value, a pair of braces around it is mandatory.

Warning 3.3 – Dislpay of first and last names of author(s)

To display the first and last names of the author(s), it is necessary:

1. To use the usual `\maketitle` → p. 9 command;
2. To do several compilations[a]:
   (a) pdfLaTeX ;
   (b) `biber` ;
   (c) pdfLaTeX.

[a] To automate these compilations, one can use the `latexmk` "compiler", provided by any recent TeX distribution, with the help of the `latexmkrc` configuration file attached to this class.

3.3 Summary

`\begin{abstract}` (→ p. 44)
⟨*abstract*⟩
`\end{abstract}`

This environment is intended to receive the article's ⟨*abstract*⟩.

3.4 Keywords

`\keywords[⟨variant of keywords⟩]{⟨keywords⟩}` (→ p. 44)

This command allows you to specify the article ⟨keywords⟩ in the form of a comma-separated list.
The "Keywords" metadata of the generated PDF file automatically contains the specified ⟨keywords⟩. If these contains characters (notably mathematical ones) that are not allowed in the metadata of PDF files, an optional argument is to specify a ⟨variant of keywords⟩ containing only allowed characters.

```
\keywords[N\string_p-space]{$\mathcal{N}_p$-space}
```

3.5 Mathematical Subject Classification (MSC)

`\msc{⟨msc⟩}` (→ p. 44)

This command allows you to specify the ⟨msc⟩ of the article l'article in the form of a comma-separated list.

4 Generating the article title

The actual title of the article, combining all the elements entered in Section 3 on p. 6, is generated by the standard `\maketitle` command.

`\maketitle` (→ p. 44)

This command *displays* the article's "title", i.e.:

- Its title and possible subtitle (`\title`→ p. 6 and `\subtitle`→ p. 6 commands);
- Its author(s), in the form of their full name(s) (`\author`→ p. 7 command) and, in footnote, their respective affiliations;
- Its possible abstract (`abstract`→ p. 8 environment) ;
- Its keyword(s) (`\keywords` command) ;
- Its MSC (`\msc` command).

```
\title[Le Traité du calcul des probabilités]{Le Traité du calcul des
  probabilités et de ses applications}
\subtitle[Étendue et limites d'un projet borélien]{Étendue et
  limites d'un projet borélien de grande envergure (1921-1939)}
%
\author[
  affiliation={Laboratoire \textsc{sphere}, Université Paris Diderot
```

```
    }
  ]{Bustamante, Martha-Cecilia}
\author[
  affiliation=[aff2]{\textsc{lpma}, Université Pierre et Marie Curie
    },
  affiliation={\textsc{ghdso}, Université Paris-Sud}]{Cléry,
    Matthias}
\author[
  affiliationtagged={aff2}
]{Mazliak, Laurent}
%
\begin{abstract}
  Cet article est consacré à l'étude détaillée du vaste projet [...]
\end{abstract}
%
\keywords{Probabilités, statistiques, balistique, assurance, jeux,
  Émile Borel, Institut Henri Poincaré}
\msc{01A60, 01A74, 60-03, 60A05, 62-03}
%
\maketitle
```

5 Acknowledgements

`\acknowledgements{`⟨*thanks*⟩`}`

This optional command allows you to specify ⟨*thanks*⟩ for an article.

```
\acknowledgments{%
  The first author's research was supported by the Hungarian
    National
  Science Foundation Grants K81658 and K104183. Research conducted
  while the second author enjoyed the hospitality of the Alfréd
    Rényi
  Institute of  Mathematics, and benefited from the \textsc{otka}
  grant K109789.%
}
```

Remark 5.1 – Displaying acknowledgements

For the acknowledgements to be displayed, it is necessary to use the `\printbibliography` command at the end of the article.

6 Structuring commands

The nwejmart class modifies the usual `\section` structuring command in order to differentiate the alternative title in toc from that in the header[6].

New: 2017-10-23

`\section[⟨alternative title toc⟩][⟨alternative title header⟩]{⟨title⟩}`

This command defines for the current section:

- Its ⟨*title*⟩ appearing throughout the text;
- Its *possible* ⟨*alternative title* toc⟩ appearing in the issue where the article will be published:
  - In the toc;
  - As a bookmark.
- Its *possible* ⟨*alternative title header*⟩[7] appearing on odd-numbered pages.

The precise use of this command is summarised in Table 2.

Table 2 – Use (of the two optional arguments) of the `\section` command

	text flow	toc	header
`\section{`⟨*title*⟩`}`	⟨*title*⟩		
`\section[`⟨*alt. toc*⟩`]{`⟨*title*⟩`}`	⟨*title*⟩	⟨*alt. toc*⟩	
`\section[][`⟨*alt. header*⟩`]{`⟨*title*⟩`}`	⟨*title*⟩		⟨*alt. header*⟩
`\section[`⟨*alt. toc*⟩`][`⟨*alt. header*⟩`]{`⟨*title*⟩`}`	⟨*title*⟩	⟨*alt. toc*⟩	⟨*alt. header*⟩

7 Bibliography

To compose bibliographies, the nwejmart class uses modern tools such as the biblatex package and biber engine. Their use can be summarized as follows[8].

1. Build a bibliographic database in a ⟨*bibliographic file*⟩[9].

[6] Note, from this point of view, the similarity with the `\title` command.
[7] I.e. in the current title.
[8] for more details, see e.g. Bitouzé, 2022a, *Conférence LaTeX # 6*, in French.
[9] Such files have a `.bib` extension.

To do this, we recommend to use a dedicated software, JabRef for instance, configured via the menu Options → Preferences → General and by choosing:

Default encoding : UTF8 ;

Default bibliography mode : biblatex.

By the way, we can change the interface language in the Language drop-down list.

Don't forget to assign a unique ⟨*key*⟩ to each bibliographic reference[10].

2. In the `.tex` source file:

   (a) *In the preamble*, use the `\addbibresource` command to specify the ⟨*bibliographic file*⟩:

   ```
   \addbibresource{⟨bibliographic file⟩.bib}
   ```

   (b) In the body of the document, use the `\autocite` command[11][12] or, optionally, the `\textcite` command[13] from the biblatex package to cite bibliographic references (each with a ⟨*key*⟩):

   ```
   ...\autocite{⟨key1⟩}... \textcite{⟨key2⟩} ...
   ...\autocite{⟨key3,key4⟩}... \textcite{⟨key5,key6⟩} ...
   ```

   (c) At the end of the document, list the bibliographic references by using the `\printbibliography` command.

3. Perform the successive compilations pdfLaTeX, biber and pdfLaTeX[14].

`\printbibliography`

This command produces the bibliographic references list entered with respect to the biblatex package syntax. It has been redefined to automatically display the possible acknowledgements (`\acknowledgements`→ p. [10] command) before the references list.

For example, if the `.bib` file contains:

[10] In `JabRef`, the "magic wand" or key icon helps to generate the ⟨*key*⟩.
[11] Preferably to the `\cite` command.
[12] The reference is then detailed in a footnote.
[13] The reference is then displayed throughout the text, but with less details.
[14] To automate these compilations, one can use the `latexmk` "compiler", provided by any recent TeX distribution, with the help of the `latexmkrc` configuration file attached to this class.

```
@Book{            har,
  author        = {Hartshorne, Robin},
  title         = {Algebraic geometry},
  note          = {Graduate Texts in Mathematics, No. 52},
  publisher     = {Springer-Verlag},
  address       = {New York},
  date          = {1977}
}
@Book{            laz1,
  author        = {Lazarsfeld, Robert},
  title         = {Positivity in algebraic geometry. I},
  volume        = {48},
  note          = {Classical setting: line bundles and linear series
    },
  publisher     = {Springer-Verlag},
  address       = {Berlin},
  date          = {2004}
}
@Article{         shin,
  author        = {Shin, Kil-Ho},
  title         = {$3$-dimensional Fano varieties with canonical
                   singularities},
  journal       = {Tokyo J. Math.},
  volume        = {12},
  date          = {1989},
  number        = {2},
  pages         = {375-385}
}
```

then the following `.tex` source file:

```
The first assertion is a direct consequence of the Riemann-Roch
formula for threefolds\autocite[See e.g.][437]{har} and
Kawamata-Viehweg vanishing\autocite[Theorem~4.3.1]{laz1}. For the
second assertion, see \textcite[Theorem~(0.4)]{shin}.
%
\printbibliography
```

provides the text appeating in the box entitled “An example of a bibliography” on the next page.

An example of a bibliography

The first assertion is a direct consequence of the Riemann-Roch formula for threefolds[1] and Kawamata-Viehweg vanishing[2]. For the second assertion, see Shin (1989, Theorem (0.4)).

References

Hartshorne, R. (1977). *Algebraic geometry*. Graduate Texts in Mathematics, No. 52. New York: Springer-Verlag (cit. on p. 14).

Lazarsfeld, R. (2004). *Positivity in algebraic geometry. I*. **48**. Classical setting: line bundles and linear series. Berlin: Springer-Verlag (cit. on p. 14).

Shin, K.-H. (1989). "3-dimensional Fano varieties with canonical singularities". *Tokyo J. Math.* **12** (2), pp. 375–385 (cit. on p. 14).

[1] See e.g. Hartshorne, 1977, *Algebraic geometry*, p. 437.
[2] Lazarsfeld, 2004, *Positivity in algebraic geometry. I*, Theorem 4.3.1.

8 Mathematics-specific commands

The nwejmart class:

- loads the following packages:
  - kpfonts which provides all the standards symbols, including those in the amssymb package, but also offers many others;
  - mathtools which itself loads amsmath (but extends it and fixes some flaws), so that all the commands of both packages are available;
  - rsfso which provides nice calligraphic letters (via the `\mathscr` command);
- redefines some commands and provides some new ones, listed below;
- provides classical "theorem" environments (based on the amsthm and thmtools packages), listed below.

8.1 Universal constants and usual functions

`\I`

This command displays the imaginary unit: “i”.

`\E[⟨argument⟩]`

Depending on its optional argument, this command displays:
- The exponential function applied to ⟨argument⟩;
- The Euler number “e”.

```
\begin{align}
  \E[\I\pi]+1 & = 0 \\
  \E          & = \sum_{n\geq 0} \frac{1}{n!}
\end{align}
```

$$e^{i\pi} + 1 = 0 \tag{1}$$

$$e = \sum_{n\geq 0} \frac{1}{n!} \tag{2}$$

Remark 8.1 – Equivalent syntaxes for the exponential function

There is equivalence between:
- `\E[⟨argument⟩]` which is provided by the class;
- `\E^{⟨argument⟩}` which is more frequent.

`\log(*)`

This command displays in its:
***not* starred form:** “ln”;
starred form: “log”.

`\lg(*)`

This command displays in its:
***not* starred form:** “ln”;
starred form: “lg”.

8.2 Sets

Usual sets

`\bbN`

This command displays the set of positive integers: "$\mathbb{N}$".

`\bbZ`

This command displays the set of relative integers: "$\mathbb{Z}$".

`\bbD`

This command displays the set of decimal numbers: "$\mathbb{D}$".

`\bbQ`

This command displays the set of rational numbers: "$\mathbb{Q}$".

`\bbR`

This command displays the set of real numbers: "$\mathbb{R}$".

`\bbC`

This command displays the set of complex numbers: "$\mathbb{C}$".

`\bbK`

This command can be used to denote any field. It displays "$\mathbb{K}$".

Defining sets

Updated: 2019-03-18

`\set{`⟨*definition*⟩`}[`⟨*characterization*⟩`]`

This command displays the set defined by ⟨*definition*⟩, with an optional ⟨*characterization*⟩[15].

```
\begin{align}
  \bbN & = \set{0,1,2,3,\dots}                \\
  \bbZ & = \bbN\cup\set{-n}[n\in\bbN]         \\
  \bbQ & = \set{p/q}[p\in\bbZ,\ q\in\bbN^*]  \\
  \bbQ & = \set{\frac{p}{q}}[p\in\bbZ,\ q\in\bbN^*]
\end{align}
```

$$\mathbb{N} = \{0, 1, 2, 3, \dots\} \tag{3}$$
$$\mathbb{Z} = \mathbb{N} \cup \{-n \mid n \in \mathbb{N}\} \tag{4}$$
$$\mathbb{Q} = \{p/q \mid p \in \mathbb{Z},\ q \in \mathbb{N}^*\} \tag{5}$$
$$\mathbb{Q} = \left\{ \frac{p}{q} \,\middle|\, p \in \mathbb{Z},\ q \in \mathbb{N}^* \right\} \tag{6}$$

[15] The part after "such that".

8.3 Trigonometric and hyperbolic functions, direct and inverse

Remark 8.2 – French-specific commands

The commands in this section are only defined (or redefined) for articles in French.

`\cot`

This command displays the cotangent function: “cot”. Its alias is `\cotan`.

`\arccos`

This command displays (the principal value of) the arccosine function: “Arccos”.

`\arcsin`

This command displays (the principal value of) the arcsine function: “Arcsin”.

`\arctan`

This command displays (the principal value of) the arctangent function: “Arctan”.

`\cosh`

This command displays the hyperbolic cosine function: “ch”. Its alias is `\ch`.

`\sinh`

This command displays the hyperbolic sine function: “sh”. Its alias is `\sh`.

`\tanh`

This command displays the hyperbolic tangent function: “th”.

Remark 8.3 – No `\th` command for the hyperbolic tangent function

The `\th` command is already defined in LaTeX and therefore cannot be used for the hyperbolic tangent function.

`\arccosh`

This command displays the inverse hyperbolic cosine function: “Argch”. Its alias is `\Argch`.

`\arcsinh`

This command displays the inverse hyperbolic sine function: “Argsh”. Its alias is `\Argsh`.

`\arctanh`

This command displays the inverse hyperbolic tangent function: “Argth”. Its alias is `\Argth`.

Commands	Example
\norm	$\|\cdot\|$
\lnorm	$\|\cdot\|_1$
\llnorm	$\|\cdot\|_2$
\lpnorm	$\|\cdot\|_p$
\supnorm	$\|\cdot\|_\infty$
\abs	$\lvert\cdot\rvert$
\prt	$(\cdot)$
\brk	$[\cdot]$
\brc	$\{\cdot\}$
\leqgeq	$\langle\cdot\rangle$
\lrangle	$\langle\cdot\rangle$

Table 3 – Commands enabling the entry of usual delimiter pairs

8.4 Pairs of delimiters

Preset commands

The class provides some commands listed in Table 3, enabling the entry of delimiter pairs, e.g. for norms, absolute values, etc.

Since these commands all have the same syntax, only the \norm command is detailed.

\norm[⟨*parameter size*⟩]{⟨*argument*⟩}

This command displays the norm of ⟨*argument*⟩.
The default delimeters height is automatically adjusted to the height of the ⟨*argument*⟩ but it is possible to specify a ⟨*size parameter*⟩ as an optional argument:

- 0: default delimiter size[16] ;
- 1 or \big: delimiter size larger than the previous one;
- 2 or \Big: delimiter size larger than the previous one;
- 3 or \bigg: delimiter size larger than the previous one;
- 4 or \Bigg: delimiter size larger than the previous one;

\norm*{⟨*argument*⟩}

This command is equivalent to \norm[0]{⟨*argument*⟩}.

[16] Delimiter size in text mode.

```
\begin{equation}
\supnorm{\frac{A}{2}}^k    \quad
\supnorm[0]{\frac{A}{2}}^k \quad
\supnorm[1]{\frac{A}{2}}^k \quad
\supnorm[2]{\frac{A}{2}}^k \quad
\supnorm[3]{\frac{A}{2}}^k \quad
\supnorm[4]{\frac{A}{2}}^k \quad
\supnorm*{\frac{A}{2}}^k
\end{equation}
```

$$\left\|\frac{A}{2}\right\|_\infty^k \quad \|\frac{A}{2}\|_\infty^k \quad \|\frac{A}{2}\|_\infty^k \quad \|\frac{A}{2}\|_\infty^k \quad \left\|\frac{A}{2}\right\|_\infty^k \quad \left\|\frac{A}{2}\right\|_\infty^k \quad \|\frac{A}{2}\|_\infty^k \tag{7}$$

Remark 8.4 – Subscripts of delimiter pairs that do not have default ones

It is always possible to manually add a subscript to a delimiter pair command that does not have one by default.

```
\begin{equation}
\norm{\frac{A}{2}}_3
\end{equation}
```

$$\left\|\frac{A}{2}\right\|_3 \tag{8}$$

e

Defining new commands

New commands that facilitate the entry of delimiter pairs can be defined by using the `\NewPairedDelimiter` command.

`\NewPairedDelimiter{`⟨*command*⟩`}{`⟨*options*⟩`}`

This command defines a ⟨*command*⟩ similar to the `\norm` command but with left and right delimiters and subscript specified in ⟨*options*⟩ by using the `left`, `right` → p. 20 and `subscript` → p. 20 keys.

`left=`⟨*delimiter*⟩ (no default value, initially empty)

This key is used to specify the left ⟨*delimiter*⟩ of the created ⟨*command*⟩.

`right=`⟨*delimiter*⟩ (no default value, initially empty)

This key is used to specify the right ⟨*delimiter*⟩ of the created ⟨*command*⟩.

`subscript=`⟨*subscript*⟩ (no default value, initially empty)

This key is used to specify the ⟨*subscript*⟩ of the created ⟨*command*⟩.

```
\NewPairedDelimiter{\floor}{
  left=\lfloor,
  right=\rfloor,
  subscript=\text{eff}
}
```

```
\begin{equation}
\floor{\frac{A}{2}}
\end{equation}
```

$$\left\lfloor \frac{A}{2} \right\rfloor_{\text{eff}} \tag{9}$$

8.5 Operators

Preset operators

`\dif`

This command displays the "d" differential operator used in particular in integrals.

```
\begin{equation}
\iiint_T f(x,y,z)\dif x \dif y \dif z=0
\end{equation}
```

$$\iiint_T f(x,y,z)\,\mathrm{d}x\,\mathrm{d}y\,\mathrm{d}z = 0 \tag{10}$$

`\grad`

This command displays the gradient:
- in the "grad" form by default;
- in the "∇" form if the `nabla` value is put in the `gradient`→ p. 5 key in argument of `\articlesetup`→ p. 5 command.

`\Div`

This command displays the divergence operator: "div".

Remark 8.5 – No command `\div` for divergence

The `\div` command is already defined in LaTeX and therefore cannot be used for divergence.

`\curl`

This command displays the rotational operator: "curl". Its alias is `\rot`.

```
\begin{align}
  \Div  F &= \grad \cdot  F \\
  \curl F &= \grad \wedge F
\end{align}
```

$$\operatorname{div} F = \operatorname{grad} \cdot F \tag{11}$$
$$\operatorname{curl} F = \operatorname{grad} \wedge F \tag{12}$$

`\supp`

This command displays the support (of a function, of a measure, etc.): "supp".

Defining new operators

New operators can be defined by using the usual `\DeclareMathOperator` command.

`\DeclareMathOperator{`⟨*command*⟩`}{`⟨*name*⟩`}`

This command defines the ⟨*command*⟩ displaying the operator named ⟨*name*⟩.

```
\DeclareMathOperator{\cat}{Cat}
```

```
A standard example is $\cat$, the $2$-category of all (small) ideals.
```

A standard example is Cat, the 2-category of all (small) ideals.

(Advanced use) Precautions for unusual binary operations

If, in binary operations, an operator[17] is followed by a usual binary LaTeX operator (`\circ`, `\cdot`, `\wedge`, etc.), the horizontal spaces between them will be correct.

However, if the binary operator is not common, it should be declared by using the `\BinaryOperators` command.

`\BinaryOperators{`⟨*binary operators*⟩`}`

This command ensures that the ⟨*binary operators*⟩[18] will, in binary operations, properly space from the preceding operators.

```
\newcommand{\mybinop}{\mathbin{*}}
```

```
\begin{tabular}{>{$}l<{$}@{ : }l}
  \grad \cdot    F & good     \\
  \grad \mybinop F & bad \\ \BinaryOperators{\mybinop}%
  \grad \mybinop F & good (thanks to \verb+\BinaryOperators{\mybinop
    }+)
\end{tabular}
```

$\grad \cdot F$: good
$\grad *F$: bad
$\grad * F$: good (thanks to \BinaryOperators{\mybinop})

[17] Preset or defined with the `\DeclareMathOperator` → p. 21 command.
[18] Separated by commas.

8.6 Miscellaneous

Remark 8.6 – French-specific commands (bis)

The following commands are only redefined for French articles.

`\leq`

This command displays "⩽".

`\geq`

This command displays "⩾".

8.7 "Theorem" environments

To easily compose theorems and similar objects, the nwejmart class provides ready-to-use environments and allows to create new ones if needed (cf. `\newtheorem`→ p. 25 command).

Preset environments

Table 4 on the next page on the next page lists theorems and similar objects predefined by the nwejmart class with:

in column 1 The names of the corresponding environments;

in column 2 Their recurring titles (automatically translated into the article language).

Remark 8.7 – Unnumbered "theorem"

Each environment in Table 4 on the next page has a starred version that creates an unnumbered version of a "theorem"-like object.

```
\begin{theorem}
  Every metrizable and sequentially compact space is compact.
\end{theorem}
\begin{definition}[congruence modulo $n$]
  Let $n$ be an integer greater than or equal to $2$. Two integers
    $a$ and $b$
  are said to be  congruent modulo $n$ if  $a - b \in n\bbZ$.
\end{definition}
\begin{remark*}
```

Environment	Title (here in French)
`theorem`	Théorème
`corollary`	Corollaire
`conjecture`	Conjecture
`proposition`	Proposition
`lemma`	Lemme
`axiom`	Axiome
`definition`	Définition
`remark`	Remarque
`example`	Example
`notation`	Notation
`proof`	Preuve

Table 4 – "theorem"-like environments

```
  One of the most beautiful mathematical relationships is $\E[i\pi]+
    1=0$.
\end{remark*}
\begin{proof}
  Everything that is rare is expensive. A cheap horse is rare.
  So a cheap horse is expensive.
\end{proof}
```

Theorem 1 – *Every metrizable and sequentially compact space is compact.*

Definition 1 (congruence modulo n) – Let n be an integer greater than or equal to 2. Two integers a and b are said to be congruent modulo n if $a-b \in n\mathbb{Z}$.

Remark – One of the most beautiful mathematical relationships is $e^{i\pi}+1 = 0$.

Proof. Everything that is rare is expensive. A cheap horse is rare. So a cheap horse is expensive. □

In the previous example, the "theorems" have different formattings. The nwejmart class provides three "theorem" styles, `theorem`, `definition` and `proof`, see their characteristics in Table 5 on the next page.

Style	Recurrent title	Content	Relevant “theorems”
`theorem`	bold, roman, numbered	italic	theorems, corollaries, conjectures, propositions, lemmas, axioms
`definition`	bold, roman, numbered	roman	definitions, remarks, examples, notations
`proof`	non bold, italic, non numbered	roman, ended with a white square	proofs

Table 5 – Provided “theorems” styles

User-defined environments

If the “theorem” environments provided by the class are not enough, the `\newtheorem` → p. 25 command can create new ones.

`\newtheorem[`⟨*option(s)*⟩`]{`⟨*name*⟩`}`

This command creates a new LaTeX environment, ⟨*name*⟩, which has by default:

- ⟨*Name*⟩[19] as recurring title;
- `theorem` as a style.

This command also creates the starry environment ⟨*name*⟩`*` which produce unnumbered occurrences of this “theorem”.

```
\newtheorem{article}
```

```
\begin{article*}[Establishment of the Union]
Reflecting the will of the citizens and States of Europe to build a
common future, this Constitution establishes the European Union
    [...]
\end{article*}
\begin{article}[Establishment of the Union]\label{premier}
Reflecting the will of the citizens and States of Europe to build a
common future, this Constitution establishes the European Union
    [...]
```

[19] Id est, regardless of the article language, the ⟨*name*⟩ of the LaTeX environment with a capital initial letter.

```
\end{article}
\vref{premier} is fundamental.
```

Article (Establishment of the Union) – *Reflecting the will of the citizens and States of Europe to build a common future, this Constitution establishes the European Union [...]*

Article 1 (Establishment of the Union) – *Reflecting the will of the citizens and States of Europe to build a common future, this Constitution establishes the European Union [...]*

Article 1 is fundamental.

If the default value of the style (`theorem`) is not suitable, you can specify in ⟨*option(s)*⟩ the desired one with the following `style` key.

`style=theorem|definition|proof` (no default value, initially `theorem`)

This key allows you to specify the style of the "theorem" to be created, using `theorem`, `definition` and `proof` values.

```
\newtheorem[style=definition]{fact}
```

```
\begin{fact}\label{major}
Everything that is rare is expensive.
\end{fact}
\begin{fact}\label{minor}
A cheap horse is rare.
\end{fact}
According to  \cref{minor,major},  a cheap horse is expensive.
```

Fact 1 – Everything that is rare is expensive.

Fact 2 – A cheap horse is rare.

According to Facts 1 and 2, a cheap horse is expensive.

If the default value of the recurring title (⟨*Name*⟩) is not suitable, you can specify in ⟨*option(s)*⟩ the desired one with the following `title` key.

`title=`⟨*recurring title*⟩ (no default value, initially empty)

This key allows you to specify a ⟨*recurring title*⟩ different from ⟨*Name*⟩, regardless of the article language.

```
\newtheorem[title=experience]{experience}
```

```
\begin{experience}\label{one}
A 6-sided dice is rolled [...]
\end{experience}
\begin{experience}\label{two}
Two 6-sided dice are rolled [...]
\end{experience}
The \vref{one,two} highlight [...]
```

Experience 1 – *A 6-sided dice is rolled [...]*

Experience 2 – *Two 6-sided dice are rolled [...]*

The Experiences 1 and 2 highlight [...]

Note that, in the case of cross-references using the `\vref` → p. 3420 (or `\cref` → p. 34) command, the recurring title of the referenced "theorem(s)" is automatically added to the reference, possibly on its plural form. By default, this latter is obtained by adding a final "s" in ⟨*name*⟩ or in ⟨*recurring title*⟩ set in the title option. If this form should be constructed differently, this should be specified in ⟨*option(s)*⟩ using the following `title-plural` key.

`title-plural`=⟨*plural form of the recurring title*⟩ (no default value, initially empty)

This key is used to specify the plural form of the recurring title.

```
\newtheorem[title-plural=rings]{ring}
```

```
\begin{ring}\label{ring}
Consider a ring: [...]
\end{ring}
\begin{ring}\label{ring-bis}
```

[20] Cf. Section 10.1 on p. 34

```
Consider another ring: [...]
\end{ring}
The \vref{ring,ring-bis} admit [...]
```

Ring 1 – *Consider a ring: [...]*

Ring 2 – *Consider another ring: [...]*

The Rings 1 and 2 admit [...]

```
\newtheorem[title=ideal,title-plural=ideals]{ideal}
```

```
\begin{ideal}\label{ideal}
Consider an ideal: [...]
\end{ideal}
\begin{ideal}\label{ideal-bis}
Consider another ideal: [...]
\end{ideal}
The \vref{ideal,ideal-bis} admit [...]
```

Ideal 1 – *Consider an ideal: [...]*

Ideal 2 – *Consider another ideal: [...]*

The Ideals 1 and 2 admit [...]

8.8 Enumerations

To make the composition of enumerations (of hypothesis, assertions, conditions, etc.) easier, the nwejmart class provides ready-to-use environments and allows to create new ones if needed (see the `\newenumeration`→ p. 29 command).

Predefined enumerations

In mathematical articles, it is common to enumerate assertions, hypothesis or conditions and to refer to these. To do this, the nwejmart class provides three environments: `assertions`→ p. 29, `hypotheses`→ p. 29 and `conditions`→ p. 29. Each assertion, hypothesis or condition is introduced by the `\item` command.

```
\begin{assertions}
  ⟨assertions⟩
\end{assertions}
```

This environment composes a list of assertions.

```
\begin{hypotheses}
  ⟨hypothesis⟩
\end{hypotheses}
```

This environment composes a list of hypothesis

New: 2019-03-18

```
\begin{conditions}
  ⟨conditions⟩
\end{conditions}
```

This environment composes a list of conditions.

```
\begin{axiom}\label{my-axiom}
  Each of the following assertions are admitted.
  \begin{assertions}
  \item\label{rare-expensive} Everything that is rare is expensive.
  \item\label{horse}A cheap horse is rare.
  \end{assertions}
\end{axiom}
According to the \vref{rare-expensive, horse} of \vref{my-axiom}, a
cheap horse is expensive.
```

Axiom 1 – *Each of the following assertions are admitted.*
(A_1) *Everything that is rare is expensive.*
(A_2) *A cheap horse is rare.*

According to the assertion (A_1) and **??** and on p. ?? of Axiom 1, a cheap horse is expensive.

User-defined enumerations

If the enumerations provided by the class are not enough, it is possible to create new ones via the `\newenumeration` command.

New: 2019-03-18

```
\newenumeration[⟨option(s)⟩]{⟨name⟩}
```

This command create a new LaTeX environment , ⟨*name*⟩, which is used as the usual `enumerate` environment of ordered lists and in which each item is introduced by the `\item` command.

```
\newenumeration{conventions}
```

```
\begin{conventions}
\item The horse is cheap.
\item The horse is expensive.
\end{conventions}
```

(C$_1$) The horse is cheap.
(C$_2$) The horse is expensive.

We note that each listed item has a default label consisting of the initial of the ⟨*name*⟩ indexed by an Arabic numeral, all in parentheses. If this label is not suitable, we can specify the desired one in the ⟨*option(s)*⟩ with the `label` key.

`label`=⟨*label*⟩ (no default value, initially initial of ⟨*name*⟩)

This key is used to specify a ⟨*label*⟩ different from the initial of the environment ⟨*name*⟩.

```
\newenumeration[label=K]{conventions}
```

```
\begin{conventions}
\item\label{k-one} The horse is cheap.
\item\label{k-two} The horse is expensive.
\end{conventions}
See \vref{k-one}. See \vref{k-one,k-two}.
```

(K$_1$) The horse is cheap.
(K$_2$) The horse is expensive.
See convention (K$_1$). See conventions (K$_1$) and (K$_2$).

Note that when cross-referencing using the `\vref`→ p. 34 (or `\cref`→ p. 34) command[21], the ⟨*name*⟩ of the referenced enumerations is automatically added to the reference, in its singular or plural form as appropriate. By default,
The plural form is the ⟨*name*⟩ ;
The singular form is obtained by deleting the last letter[22] of the ⟨*name*⟩.

[21] See Section 10.1 on p. 34
[22] Supposed to be an "s".

If these singular or plural forms must be built differently, they should be specified in the ⟨*option(s)*⟩ via the following `singular`→ p. 31 and `plural`→ p. 31 keys.

`singular`=⟨*singular form of the enumeration*⟩ (no default value, initially empty)

This key is used to specify the singular form of the enumeration.

`plural`=⟨*plural form of the enumeration*⟩ (no default value, initially empty)

This key is used to specify the plural form of the enumeration.

```
\newenumeration[singular=criterion]{criteria} % Otherwise, sing.
    form = ""criteri.
```

```
\begin{criteria}
\item\label{criterion-one} The horse is cheap.
\item\label{criterion-two} The horse is expensive.
\end{criteria}
See \vref{criterion-one}. See \vref{criterion-one,criterion-two
    }.
```

(C$_1$) The horse is cheap.
(C$_2$) The horse is expensive.
See criterion (C$_1$). See criteria (C$_1$) and (C$_2$).

```
\newenumeration[singular=rôle,plural=rôles]{roles}
```

```
\begin{roles}
\item\label{role-one} The horse is cheap.
\item\label{role-two} The horse is expensive.
\end{roles}
Cf. \vref{role-one}. Cf. \vref{role-one,role-two}.
```

(R$_1$) The horse is cheap.
(R$_2$) The horse is expensive.
Cf. rôle (R$_1$). Cf. rôles (R$_1$) and (R$_2$).

If necessary, the `\renewenumeration`→ p. 32 command can be used to redefine an enumeration previously defined with the `\newenumeration`→ p. 29 command.

New: 2019-03-18

`\renewenumeration[`⟨*option(s)*⟩`]{`⟨*name*⟩`}`

This command redefines the enumeration environment ⟨*name*⟩. Its ⟨*option(s)*⟩ are the same as those of the `\newenumeration`→ p. 29 command.

9 Generalist commands

In addition to math-specific commands, the nwejmart class provides generalist commands to make easier the input of an article to be published in NWEJM.

`\ie(*)`

This command displays the phrase "id est" translated into the language of the article, in the form:
***non* starred:** abbreviated to "i.e." ;
starred: in unabbreviated form "id est".

`\Ie(*)`

This command displays the phrase "Id est" translated into the language of the article, in the form:
***non* starred:** abbreviated to "I.e." ;
starred: in unabbreviated form "Id est".

`\century(*){`⟨*number*⟩`}`

This command displays the ordinal of the ⟨*number*⟩[23][24] of a century, followed by the word "century" translated into the article language and by the possible mention that it is a century before our era. Thus:

```
In the \century{-1}, [...]. Later, in the \century{8}, [...]
```

In the 1st century BC, [...]. Later, in the 8th century, [...]

The starred version displays only the ordinal (unless the ⟨*number*⟩ is negative). Thus:

```
Agriculture in the \century*{-1} was [...].
The poetry of the \century*{19} has profoundly marked [...].
```

[23] This number must be a non-zero integer, negative if appropriate.
[24] In French and German, ⟨*number*⟩ is written in Roman numerals and small capitals.

Agriculture in the 1st century BC was [...]. The poetry of the 19th has profoundly marked [...].

`\aside(*){⟨text⟩}`

This command allows you to compose ⟨*text*⟩ between long dashes.
In the non starred form, it inserts the ⟨*text*⟩ between two long dashes.
In the starred form, the ⟨*text*⟩ is simply preceded by a dash. This is to be used at the end of a sentence.
Thus :

```
Experiences \aside{in the \enquote{real} word} have been
    triggered by digital experiences.
```

Experiences — in the “real” word — have been triggered by digital experiences.

and:

```
It is suspected not  \aside*{for example it is expected that  $
    1/\pi$  is not a period}.
```

It is suspected not — for example it is expected that $1/\pi$ is not a period.

`\nwejm`

This command displays:
In the *non* starred form: the abbreviated version “NWEJM”;
In the starred form: the *non* abbreviated version “*North-Western European Journal of Mathematics*”.

10 Selection of tools from third party packages

This section lists some tools (commands and environments) provided by packages automatically loaded by the nwejmart class[25].

[25] L’Appendix B on p. 41 lists those whose features may be useful for authors.

Warning 10.1 – Non-exhaustive list of features from third party packages

This lists is *non exhaustive*:
- Only a tiny fraction of the existing packages are loaded by the class;
- Only some of the packages loaded by the class are mentioned;
- Only some features of the mentioned packages are described. More information is available in the documentation of these packages.

10.1 Cross-referencing

The cleveref package package makes cross-referencing powerful. In particular, it provides the following commands `\cref` and `\vref`.

`\cref{`⟨*label*$_1$⟩`,...,`⟨*label*$_n$⟩`}`

If one or more objects[26] are labelled with `\label{`⟨*label*$_1$⟩`}`,..., `\label{`⟨*label*$_n$⟩`}` , the command `\cref`:
- displays their numbers[27];
- detects their nature[26] and displays the corresponding keywords[28] before their numbers, automatically translated into the article language[29].

```
Please refer to \cref{sec-title,sec-authors} [...]
```

Please refer to Sections 3.1 and 3.2 [...]

`\vref{`⟨*label*$_1$⟩`,...,`⟨*label*$_n$⟩`}`

This command:
- includes the features of `\cref`;
- displays[30] the (numbers of the) pages where they are located[31] after the numbers of the referenced objects.

```
Please refer to \vref{sec-title,sec-authors} [...]
```

Please refer to Sections 3.1 and 3.2 on p. 6 and on p. 7 [...]

[26] Section, equation, theorem, figure, array, etc.
[27] Surrounded by brackets where customary, e.g. for equations.
[28] Feature provided by the cleveref package package.
[29] Feature provided by the nwejmart class.
[30] Or not, depending on the context.
[31] Feature provided by the varioref package.

Remark 10.1 – Hyperlinks to a referenced object

The numbers and possible — numbers of — pages of the cross-references created with \cref and \vref are hyperlinks to referenced objects[a].

[a]Feature provided by the hyperref package.

10.2 Acronyms

Acronyms often need to be used in mathematical articles. To this end, the glossaries package offers a very efficient and simple feature: just use the commands:

- \newacronym to *define* an acronym;
- \gls (or \acrshort→ p. 36) to *display* an acronym.

\newacronym{⟨key⟩}{⟨short form⟩}{⟨long form⟩}

This command, best used in the preamble, defines an acronym where:

1. ⟨key⟩ identifies the acronym uniquely in the document[32];
2. ⟨short form⟩ is the acronym itself;
3. ⟨long form⟩ is the meaning of the acronym.

Warning 10.2 – Short form of acronyms: in lowercase

The ⟨short form⟩ of an acronym has to be entered exclusively in lowercase since it will be actually composed in small capitals.

\gls{⟨key⟩}

This command displays the acronym identified by {⟨key⟩} according to the following principle:

1. The first occurrence of this command in the document displays the acronym in its *complete* form, id est its ⟨long form⟩ followed by its ⟨short form⟩ in brackets;
2. The following ones display the acronym only in ⟨short form⟩.

```
\newacronym{bap}{bap}{bounded approximation property}
```

[32]The author should be careful not to use the same key twice to identify different acronyms.

```
\begin{enumerate}
\item \gls{bap},
\item \gls{bap}.
\end{enumerate}
```

1. bounded approximation property (BAP),
2. BAP.

`\acrshort{`⟨*key*⟩`}`

This command displays (only) the ⟨*short form*⟩ of the acronym, whatever the context[33].

Remark 10.2 – The `\acrshort` command: useful in a title

The `\acrshort` command can be useful in particular in the article title where you do not want the full form of an acronym to be detailed.

The glossaries package provides many other commands and features[34].

10.3 Quotes, citations

The csquotes package is dedicated to formal and informal citations, and text excerpts. It includes the following easy-to-use `\enquote` command.

`\enquote{`⟨*text*⟩`}`

This command composes the ⟨*text*⟩ in quotation marks, automatically adapted to:

- The typographic standards of the current language. It will therefore be used whenever text is to be enclosed in quotes;
- The level (1 or 2) of "citation" in case of nesting. It can therefore be used whenever text is to be informally quoted.

```
he replied: \enquote{Courteline used to say: \enquote{To be
    taken for
    an idiot in the eyes of an imbecile is the pleasure of a
    fine gourmet.}}
```

[33] Id est even if it is the first time the acronym is used in the document.
[34] For more details, see for instance Bitouzé, 2022b, *Conférence LaTeX # 7*.

> he replied: “Courteline used to say: ‘To be taken for an idiot in the eyes of an imbecile is the pleasure of a fine gourmet.’”

`\blockcquote{`⟨*key*⟩`}{`⟨*excerpt*⟩`}`

This command allows you to quote an ⟨*excerpt*⟩ formally[35]. The corresponding bibliographic reference must be included in one of the added [36] `.bib` files and identified by the key ⟨*key*⟩.

```
\citeauthor{Bitouze} specifies that:
\blockcquote{Bitouze}{%
  \textins{This} command composes the citations by detaching
  automatically from the current paragraph those which are
  long.%
}.
```

> Bitouzé specifies that: “[This] command composes the citations by detaching automatically from the current paragraph those which are long.”[1].

[1] Bitouzé, 2022a, *Conférence LaTeX # 6*.

The `\blockcquote` command has optional arguments allowing to add text ⟨*prior*⟩ and/or ⟨*subsequent*⟩ to the excerpt citation[37].

10.4 Web addresses (URL)

The hyperref package provides (among other things) the `\url` command, which makes it easy the display of web adresses, also known as “Uniform Resource Locator (URL)”, even if they contain special TeX characters (`#`, `%`, `_`, `~`, `&`, etc.): these characters can therefore be entered as they are, unless the `\url` command is used in the argument of another command[38], in which case the `#` and `%` characters must be preceded by the backslash command `\`.

`\url{`⟨*Web address*⟩`}`

This command displays the ⟨*Web address*⟩ entered *as is* and makes it a hypertext link.

[35] Id est with details of the source.
[36] Using the `\addbibresource` command
[37] For more details, see for instance Bitouzé, 2022a, *Conférence LaTeX # 6*.
[38] For instance `\footnote`.

```
We refer to the instructions to authors on our website
\url{http://math.univ-lille1.fr/~nwejm/#Authors}.
```

We refer to the instructions to authors on our website http://math.univ-lille1.fr/~nwejm/#Authors.

10.5 Lists within paragraphs

The reader is certainly familiar with the `itemize`, `enumerate` and `description` environments for creating respectively unordered[39], ordered[40] and "description" lists. The enumitem package provides starred versions of these environments which compose these lists within the same paragraph[41].

```
\begin{itemize*}
  ⟨list⟩
\end{itemize*}
```

This environment composes a "bulleted" list.

```
\begin{enumerate*}
  ⟨list⟩
\end{enumerate*}
```

This environment composes a "numbered" list.

```
\begin{description*}
  ⟨list⟩
\end{description*}
```

This environment composes a "description" list.

```
\begin{enumerate}
\item The data I have collected [...]
\item The data I have collected  are
  \begin{enumerate*}
  \item publicly available on the internet: web pages and CVs of
    speakers;
  \item accessible via Wikipedia, through the precious
    \enquote{mathematics genealogy project}
```

[39] "Bulleted".

[40] Id est numbered

[41] The first aim of this package is to customize lists, but this is not recommended in the NWEJM framework as it may contravene its typographic approach.

```
    (\url{http://genealogy.math.ndsu.nodak.edu/});
  \item for 60 of the speakers for whom my information was too
    incomplete, [...].
  \end{enumerate*}
\end{enumerate}
```

1. The data I have collected [...]
2. The data I have collected are (a) publicly available on the internet: web pages and CVs of speakers; (b) accessible via Wikipedia, through the precious "mathematics genealogy project" (`http://genealogy.math.ndsu.nodak.edu/`); (c) for 60 of the speakers for whom my information was too incomplete, [...].

A Typical source file outline

Readers wishing to write an article in the *North-Western European Journal of Mathematics* will below an outline of a source file which is a typical template for a standard article. The less frequent commands and environments have been commented out. It is attached to the PDF file of this documentation[42].

Typical source file outline

```
% This is a template that may be used for the articles submitted to the
% North-Western European Journal of Mathematics.
%
%%%%%%%%%%%%
% CAUTION! %
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
% This template is based on the `nwejmart` class. For:
%
% - your name(s), as author(s) of this article,
% - the list of bibliographic references,
%
% to be correctly displayed, this class requires :
%
% - the `biblatex` package (already loaded by the class),
% - as a bibliographic engine, NOT the usual `bibtex`, BUT `biber`.
%
% See the documentation (currently only in French) for more details.
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
%
% The language of the article is by default English. Should it be French, German
% or Dutch instead, it would be specified as \documentclass' option.
```

[42] To extract it, it should be enough to click on the icon below. It can also be copied and pasted: most PDF viewers allow you to select and copy text.

```
\documentclass[
% french  % If the language of the article will be French
% german  % If the language of the article will be German
% dutch   % If the language of the article will be Dutch
]{nwejmart}
%
% Specify your own bibtex file, preferrably at `biblatex' format (don't forget
% the `.bib' extension below) in the argument of the \addbibresource command.
\addbibresource{}
%
% Should acronyms be used in the article, define them thanks to \newacronym
% command from `glossaries' package as follows:
%  - 1st argument: ⟨label⟩      of the acronym (also called key),
%  - 2nd argument: ⟨short⟩form of the acronym (lowercase!),
%  - 3rd argument: ⟨long⟩form  of the acronym,
% and use them with \gls{⟨label⟩} (or, if needed, with \acrshort{⟨label⟩}).
% See `glossaries' package's documentation for more details.
% \newacronym{}{}{}
%
\begin{document}
%
% Title of the article. A short form (that will be displayed in the headers and
% in the volume's TOC) may be specified as optional argument.
\title{}
%
% Subtitle of the article, if any. A short form may be specified as optional
% argument.
% \subtitle{}
%
% Author(s) of the article:
% - one \author command per author,
% - mandatory argument entered as ⟨`Last⟩Name, ⟨First⟩Name'.
% Use the key-value `affiliation⟨={⟩affiliation}' optional argument for each
% affiliation of the author. An affiliation can be tagged
% (`affiliation⟨=[⟩tag⟨]{⟩affiliation}') and reused later
% (affiliationtagged⟨={⟩tag}).
\author[affiliation={}]{, }
% \author[affiliation={}]{, }
%
% The abstract is entered as usually.
\begin{abstract}
  ...
\end{abstract}
%
% The keywords are entered thanks to \keywords command, as a comma separated list.
\keywords{}
%
% The Mathematical Subject Classification (MSC) are entered thanks to \msc
% command, as a comma separated list.
\msc{}
%
% The title is made as usually. Be aware that author(s) will be displayed or
% updated only if a `biber' run (cf. `nwejm''s documentation for more details).
\maketitle
%
% Acknowledgments, if any, are entered thanks to \acknowledgments command (and
% will be displayed just before the bibliography, thanks to the
% \printbibliography command).
% \acknowledgments{}
%
```

```
% Here comes the article's content.
...
%
% The \printbibliography command (from `biblatex' package) displays the list of
% references (preceded by the acknowledgments, if any)
\printbibliography
%
\end{document}
```

B Packages loaded (or not) by the class

B.1 Packages loaded by the class

We have seen that, for several of its features, the nwejmart class relies on automatically loaded packages. Those whose features can be useful to the authors of *NWEJM* articles are listed below. Their function and possible option(s) are indicated.

In addition to the specific tools to the nwejmart class, all those provided by these different packages are therefore available to *NWEJM* authors.

nag: reporting[43] of obsolete packages, commands and environments:

default options: `l2tabu`, `orthodox`;

kpfonts : main font of the document:

default options: `noDcommand`;

graphicx: image inclusion;

subcaption: sub-figures and sub-arrays;

adjustbox: adjusting box position, for example of images;

xspace: defining commands that don't "eat" the space that follows;

array: extending (and bug-fixing) array environments;

booktabs: professional-looking arrays;

csquotes: informal and formal citations[44]:

default option: `autostyle`;

default setting: `\SetCiteCommand{\autocite}`;

biblatex: powerfull bibliography management;

[43] In the form of *warnings*.

[44] With citation of sources, see Section 10.3 on p. 36.

datetime2: date and time formats:

default option: useregional;

hyperref : support for hyperlinks[45]:

default option: hidelinks, pdfencoding=unicode, final, breaklinks, hypertexnames=false;

glossaries: creation of glossaries and (lists of) acronyms:

default option: nowarn;

varioref: smart page references.

cleveref: smart cross-referencing[46];

default option: french, ngerman, dutch, english, noabbrev, capitalize.

B.2 Packages not loaded by the class

The following list, for from being exhaustive, lists packages not loaded by the nwejmart class but which may prove useful to authors. In addition, when manually loaded, some of them have options or settings set by the nwejmart class, the most notable of which are specified.

tikz-cd: easy creation of very high quality commutative diagrams[47];

pgfplots: easy creation of very high quality (2D or 3D) figures to represent functions or experimental data;

siunitx: management of numbers, angles and units, and vertical alignment on the decimal separator in tables:

default option:

- detect-all;
- locale=FR or UK or DE depending on the article language;

listings: insertion of computer listings;

todonotes: insertion of "TODO"[48].

[45] See Section 10.4 on p. 37.
[46] See Section 10.1 on p. 34.
[47] The xy package, often used for such diagrams, is incompatible with the present class: See Appendix C on the next page.
[48] Reminders of points to add, complete, modify, etc.

C Incompatibilities

For technical reasons, the *nwejm* does not accept a `.tex` source file loading the xy package and the nwejmart will issue an error in that case. The user who has to compose "matrix-like" diagrams, and especially commutative diagrams, should use the modern and user-friendly tikz-cd package.

D Notations, syntax, terminology and colour coding

We specify here the notations, syntax, terminology and colour coding of this documentation.

D.1 Commands, environments, keys, values

Commands, environments, keys and key values are systematically composed in monospaced font. In addition, to distinguish them easily, these are displayed with their own colours:

- blue commands: `\command`;
- "teal" environments: `environment`;
- purple keys: `key`;
- violet keys values: `value`.

D.2 Generic arguments

To explain the role of a command, it is sometimes necessary to indicate what it applies to. In other words, what its generic argument is. Such an argument is composed:

- in monospaced font;
- in italics;
- between single rafters;

all in brown, thus: ⟨*generic argument*⟩.

D.3 Hyperlinks

Hyperlinks are shown in colour, as follows: hyperlink. Most references to commands, environments and keys defined in this document are hyperlinks, topped by the page number where the corresponding target is located (unless it is on the same page):

- `\author`→ p. 7;
- `abstract`→ p. 8.

D.4 "Mandatory" elements

The 🔒 icon next to certain items (commands or environments) indicates that they are "mandatory".

D.5 Source codes

The examples in this documentation consist of source code and, where appropriate, the corresponding

screen shots.

These source codes are shown in blue boxes, which may include a title:

- unshaded if they are to be entered in the body of the document;

```
⟨source code⟩
```

⟨title⟩

```
⟨source code⟩
```

- shaded if they are to be entered in the preamble of the file.

```
⟨source code to be inserted in preamble⟩
```

⟨title⟩

```
⟨source code to be inserted in preamble⟩
```

D.6 Spaces in source code

To avoid confusion, spaces in source code that must be entered using the keyboard are sometimes realized with the ␣ mark.

D.7 Options

This class, and some of its commands and environments, can be adjusted with options, or lists of options (separated by commas). These options can be in the form ⟨*key*⟩=⟨*value*⟩ and the inputted ⟨*value*⟩ can be:

free. If such a ⟨*key*⟩ is for instance named `freekey`, then it is documented according to the following syntax:

`freekey`=⟨*value*⟩ (⟨*default and initial values*⟩)
⟨*Description of freekey*⟩

imposed (from a list of possible values). If such a ⟨*key*⟩ is for instance named `choicekey` and with imposed values `value1`, …, `valueN`, then it is documented according to the following syntax[49]:

`choicekey`=`value1`|...|`valueN` (⟨*default and initial values*⟩)
⟨*Description of choicekey and its possible values*⟩

The ⟨*default and initial values*⟩ of a key are often specified (in brackets at the end of a line). They indicate the value of the key:

by default i.e. when the key *is* used *alone* i.e. without any explicit value imputed;

initially i.e. when the key *is not* used.

References

Bitouzé, D. (Feb. 4, 2022a). *Conférence LaTeX # 6. Bibliographie (biber/biblatex), citations d'extraits*. French. Université du Littoral Côte d'Opale. URL: `https://mt2e.univ-littoral.fr/Members/denis-bitouze/pub/latex/diapositives-cours-d/conference-n-6/@@download/file/en-ligne6.pdf` (cit. on pp. 11, 37).

Bitouzé, D. (Feb. 4, 2022b). *Conférence LaTeX # 7. Glossaires et (liste d')acronymes, index*. French. Université du Littoral Côte d'Opale. URL: `https://mt2e.univ-littoral.fr/Members/denis-bitouze/pub/latex/diapositives-cours-d/conference-n-7/@@download/file/en-ligne7.pdf` (cit. on p. 36).

[49] As is often the case in computing, the vertical bar to separate the possible values means "or".