LaTeX Cheat Sheet

Document classes

`article` Best suited for exercise sheets.

Used at the very beginning of a document : `\documentclass{`*class*`}`. Use `\begin{document}` to start contents and `\end{document}` to end the document.

Common `documentclass` options

`10pt/11pt/12pt`	Font size.
`letterpaper/a4paper`	Paper size.
`twocolumn`	Use two columns.
`twoside`	Set margins for two-sided.
`landscape`	Landscape orientation.
`draft`	Double-space lines.

Usage : `\documentclass[`*opt,opt*`]{`*class*`}`.

Recommended packages

N.B. In the PDF version of this cheat sheet all package names link to their respective CTAN page for quick access to the full documentation.

`babel`	Support for non-English languages. See below for French typesetting.
`geometry`	Page layout (margins, etc.)
`multicol`	Use n columns : `\begin{multicols}{`n`}`.
`fancyhdr`	Customize header and footer
`mathtools`	Advanced math typesetting. Includes `amsmath`.
`graphicx`	Show image : `\includegraphics[width=`*x*`]{`*file*`}`.
`hyperref`	Insert URL : `\url{`*https://...*`}` or hyperlink : `\href{URL}{text}`.
`enumitem`	Customize `enumerate`.
`tabularx`	Stretchable `X` columns in tables.
`tabulary`	Automatically balanced column widths.
`tabto`	Tab stops (compatible with enumerations).
`tikz`	**T**ikZ **i**st **k**ein **Z**eichenprogramm. Make beautiful and precise scientific drawings. Full online documentation : `https://tikz.dev`
`tkz-euclide`	Tools for drawing Euclidean geometry ; based on TikZ/PGF.
`tkz-tab`	Tableaux de variations / signes.
`pgfplots`	Create various high-quality plots ; based on TikZ/PGF.
`beamer`	For creating slides.

Use before `\begin{document}`.
Usage : `\usepackage{`*package*`}`

Title

`\author{`*text*`}`	Author of document.
`\title{`*text*`}`	Title of document.
`\date{`*text*`}`	Date.

These commands go before `\begin{document}`. The declaration `\maketitle` goes at the top of the document.

Miscellaneous

`\pagestyle{empty}`	Empty header, footer and no page numbers.
`\tableofcontents`	Add a table of contents here.

Document structure

`\part{`*title*`}`
`\chapter{`*title*`}`
`\section{`*title*`}`
`\subsection{`*title*`}`
`\subsubsection{`*title*`}`
`\paragraph{`*title*`}`
`\subparagraph{`*title*`}`

Use a `*`, as in `\section*{`*title*`}`, to not number a particular item—these items will also not appear in the table of contents.

Text environments

`\begin{comment}`	Comment (not printed). Requires `verbatim` package.
`\begin{quote}`	Indented quotation block.
`\begin{quotation}`	Like `quote` with indented paragraphs.
`\begin{verse}`	Quotation block for verse.

Lists

`\begin{enumerate}`	Numbered list.
`\begin{itemize}`	Bulleted list.
`\begin{description}`	Description list.
`\item` *text*	Add an item.
`\item[`*x*`]` *text*	Use *x* instead of normal bullet or number. Required for descriptions.

References

`\label{`*marker*`}`	Set a marker for cross-reference, often of the form `\label{sec:item}`.
`\ref{`*marker*`}`	Give section/body number of marker.
`\pageref{`*marker*`}`	Give page number of marker.
`\footnote{`*text*`}`	Print footnote at bottom of page.

Floating bodies

`\begin{table}[`*place*`]`	Add numbered table.
`\begin{figure}[`*place*`]`	Add numbered figure.
`\begin{equation}[`*place*`]`	Add numbered equation.
`\caption{`*text*`}`	Caption for the body.

The *place* is a list valid placements for the body. `t`=top, `h`=here, `b`=bottom, `p`=separate page, `!`=place even if ugly. Captions and label markers should be within the environment.

Text properties

Font face

Command	*Declaration*	*Effect*
`\textrm{`*text*`}`	`{\rmfamily` *text*`}`	Roman family
`\textsf{`*text*`}`	`{\sffamily` *text*`}`	Sans serif family
`\texttt{`*text*`}`	`{\ttfamily` *text*`}`	`Typewriter family`
`\textmd{`*text*`}`	`{\mdseries` *text*`}`	Medium series
`\textbf{`*text*`}`	`{\bfseries` *text*`}`	**Bold series**
`\textup{`*text*`}`	`{\upshape` *text*`}`	Upright shape
`\textit{`*text*`}`	`{\itshape` *text*`}`	*Italic shape*
`\textsl{`*text*`}`	`{\slshape` *text*`}`	*Slanted shape*
`\textsc{`*text*`}`	`{\scshape` *text*`}`	Small Caps shape
`\emph{`*text*`}`	`{\em` *text*`}`	*Emphasized*
`\textnormal{`*text*`}`	`{\normalfont` *text*`}`	Document font
`\underline{`*text*`}`		Underline

The command (t*ttt*) form handles spacing better than the declaration (t*ttt*) form.

Font size

`\tiny` tiny
`\scriptsize` scriptsize
`\footnotesize` footnotesize
`\small` small
`\normalsize` normalsize
`\large` large
`\Large` Large
`\LARGE` LARGE
`\huge` huge
`\Huge` Huge

These are declarations and should be used in the form `{\small ...}`, or without braces to affect the entire document.

Verbatim text

`\begin{verbatim}`	Verbatim environment.
`\begin{verbatim*}`	Spaces are shown as ␣.
`\verb!text!`	Text between the delimiting characters (in this case '`!`') is verbatim.

Justification

Environment	*Declaration*
`\begin{center}`	`\centering`
`\begin{flushleft}`	`\raggedright`
`\begin{flushright}`	`\raggedleft`

Better typesetting (by enabling hyphenation) can be achieved using the package `ragged2e` and its environments `RaggedRight`, `RaggedLeft`, and `Center`.

Miscellaneous

`\linespread{`x`}` changes the line spacing by the multiplier x.

French typography

Use babel-french :

```
\usepackage[french]{babel}
% fix spacing when using « » in source
\frenchsetup{og=«, fg=»}
% fix spacing in e.g. $1,23$
\usepackage{icomma}
```

1er	`1\ier`	1ers	`1\iers`	1re	`1\iere`	1res	`1\ieres`
2e	`2\ieme`	2es	`2\iemes`	Mme	`M\up{me}`	Dr	`D\up{r}`
œ	`\oe`	Œ	`\OE`	æ	`\ae`	Æ	`\AE`
no	`\no`	nos	`\nos`	No	`\No`	Nos	`\Nos`
«	`\og{}`	»	`\fg{}`	« Oh! »	`\frquote{Oh!}`		

Polyglossia is a modern replacement for `babel`, but it's only compatible with XeLaTeX and LuaLaTeX.

Text-mode symbols

Symbols

&	`\&`	_	`\_`	...	`\ldots`	•	`\textbullet`
$	`\$`	^	`\^{}`	|	`\textbar`	\	`\textbackslash`
%	`\%`	~	`\~{}`	#	`\#`	§	`\S`

Delimiters

` ` `	` `` `	`{\{`	`[[`	`((`	< `\textless`
' '	'' ''	`}\}`	`]]`	`))`	> `\textgreater`

Dashes

Name	*Source*	*Example*	*Usage*
hyphen	-	X-ray	In words.
en-dash	--	1–5	Between numbers.
em-dash	---	Yes—or no?	Punctuation.

Line and page breaks

\\	Begin new line without new paragraph.
*	Prohibit pagebreak after linebreak.
\pagebreak	Start new page.
\columnbreak	Start new column.
\noindent	Do not indent current line.

Spaces and rules

~	Fixed space, disallow linebreak (N.~Biever).
\smallskip	Small vertical space.
\medskip	Medium vertical space.
\bigskip	Big vertical space.
\hspace{*l*}	Horizontal space of length l (Ex: $l = 20$pt).
\vspace{*l*}	Vertical space of length l.
\rule{*w*}{*h*}	Line of width w and height h.

Rules of width/height 0 are sometimes useful for solving spacing or alignment issues.

Tables and tab stops

Tab stops: tabbing vs. tabto

\= Set tab stop. \> Go to tab stop.

Tab stops can be set on "invisible" lines with \kill at the end of the line. Normally \\ is used to separate lines.

The tabbing environment is incompatible with enumerate/itemize. In this case it's better to use the package tabto instead:

```
\TabPositions{2cm, 5cm}
Some\tab sample\tab text.
```

tabular environment

\begin{array}[*pos*]{*cols*}
\begin{tabular}[*pos*]{*cols*}
\begin{tabular*}{*width*}[*pos*]{*cols*}

tabular column specification

l	Left-justified column.
c	Centered column.
r	Right-justified column.
p{*width*}	Same as \parbox[t]{*width*}.
@{*decl*}	Insert *decl* instead of inter-column space.
|	Inserts a vertical line between columns.

tabular elements

\hline	Horizontal line between rows.
\cline{x-y}	Horizontal line across columns x through y.
\multicolumn{*n*}{*cols*}{*text*}	A cell that spans *n* columns, with *cols* column specification.

Math mode

For inline math, use \(...\) or $...$. For displayed math, use \[...\] or \begin{equation}.

2^x	2^{x}	x_0	x_{0}
$\frac{x}{y}$	\frac{x}{y}	$\sqrt[n]{x}$	\sqrt[n]{x}
$\sum_{k=1}^{n}$	\sum_{k=1}^n	$\prod_{k=1}^{n}$	\prod_{k=1}^n
$\int_a^b f$	\int_a^b f	$\iint_S$	\iint_S
$\vec{u}$	\vec{u}	$\overrightarrow{AB}$	\overrightarrow{AB}

Vectors, matrices, and determinants

```
\vec{u}\binom{4}{2}
```
$\vec{u}\binom{4}{2}$

```
\vec{v}
\begin{psmallmatrix}
-3 \\ 1 \\ 4
\end{psmallmatrix}
```
$\vec{v}\begin{pmatrix}-3\\1\\4\end{pmatrix}$

```
\begin{pmatrix}
1&2\\   3&4
\end{pmatrix}
```
$\begin{pmatrix}1&2\\3&4\end{pmatrix}$

```
\begin{vmatrix}
1&2\\   3&4
\end{vmatrix}
```
$\begin{vmatrix}1&2\\3&4\end{vmatrix}$

Math-mode symbols

$\leq$	\leq	$\geq$	\geq	$\neq$	\neq	$\approx$	\approx
$\times$	\times	$\div$	\div	$\pm$	\pm	$\cdot$	\cdot
$^\circ$	^{\circ}	$\circ$	\circ	$\prime$	\prime	$\cdots$	\cdots
∞	\infty	$\neg$	\neg	$\wedge$	\wedge	$\vee$	\vee
$\supset$	\supset	$\forall$	\forall	$\in$	\in	$\rightarrow$	\rightarrow
$\subset$	\subset	$\exists$	\exists	$\notin$	\notin	$\Rightarrow$	\Rightarrow
$\cup$	\cup	$\cap$	\cap	$\mid$	\mid	$\Leftrightarrow$	\Leftrightarrow
$\dot{a}$	\dot a	$\hat{a}$	\hat a	$\bar{a}$	\bar a	$\tilde{a}$	\tilde a
α	\alpha	β	\beta	γ	\gamma	δ	\delta
ϵ	\epsilon	ζ	\zeta	η	\eta	ε	\varepsilon
θ	\theta	ι	\iota	κ	\kappa	ϑ	\vartheta
λ	\lambda	μ	\mu	ν	\nu	ξ	\xi
π	\pi	ρ	\rho	σ	\sigma	τ	\tau
υ	\upsilon	ϕ	\phi	χ	\chi	ψ	\psi
ω	\omega	Γ	\Gamma	Δ	\Delta	Θ	\Theta
Λ	\Lambda	Ξ	\Xi	Π	\Pi	Σ	\Sigma
Υ	\Upsilon	Φ	\Phi	Ψ	\Psi	Ω	\Omega

Sample LaTeX document

```
\documentclass[a4paper,11pt]{article}
% compile with LuaLaTeX
\usepackage{mathtools}% loads amsmath
\usepackage{unicode-math}% loads fontspec

\title{Sample document}
\author{A. Uthor}

\begin{document}
\maketitle

\section{Section title}
\subsection*{Unnumbered subsection}
text \textbf{bold text} text. Some math: $2+2=5$
\subsection{Subsection title}
text \emph{emphasized text} text. Display math:
\[
\int_0^1 x^2 \,\symrm{d}x = \frac{1}{3}
\]

A centered table:
\begin{center}
\begin{tabular}{|l|c|r|}
\hline
first  &  row  &  abc \\
second &  row  &  defghi \\
\hline
\end{tabular}
\end{center}
\end{document}
```

Online tools

Detexify: https://detexify.kirelabs.org/
Table generator: https://www.tablesgenerator.com/latex_tables
Mathpix: https://mathpix.com/

https://wch.github.io/latexsheet/
https://gschintgen.github.io/latexsheet/