LaTeX Typeset documents

.tex source your text → `pdflatex` → **.aux .toc .bbl** refs, contents, citations → `run again` → **PDF** final output

CONCEPTS

Source is plain text: commands start with a backslash, groups use {braces}, % starts a comment.

Cross-references and the table of contents need two runs; latexmk repeats runs for you.

Blank line starts a new paragraph; a single line break is just a space.

Reserved characters need a backslash: \# \$ \% \& _ \{ \}.

DOCUMENT STRUCTURE

\documentclass[11pt, a4paper]{article}
Class and options

\usepackage{*<pkg>*}
Load a package (preamble)

\title{*<t>*} \author{*<a>*} \date{\today}
Title block data

\maketitle
Print the title block

\section{*<t>*}
Numbered section

DOCUMENT STRUCTURE (cont.)

\subsection{*<t>*}
Subsection

\usepackage[margin=2.5cm]{geometry}
Set page margins

\usepackage{hyperref}
Clickable links; load last

TEXT

\textbf{*<text>*}
Bold

\textit{*<text>*}
Italic

\emph{*<text>*}
Emphasis

\includegraphics[width=\linewidth]{*<img>*}
Insert image (graphicx)

LISTS

\begin{itemize} \item *<a>* \end{itemize}
Bullet list

\begin{enumerate} \item *<a>* \end{enumerate}
Numbered list

MATH

$ a^2 + b^2 $
Inline math

MATH (cont.)

\[*<formula>* \]
Display math, unnumbered

\begin{equation} ... \end{equation}
Numbered equation

\begin{align} a &= b \\ &= c \end{align}
Aligned multi-line (amsmath)

x^{2} x_{i}
Superscript, subscript

\frac{*<a>*}{*<b>*}
Fraction

\sum_{i=1}^{n} \int_a^b \prod
Sum, integral, product

\alpha \beta \pi \Delta
Greek letters

\usepackage{amsmath}
Needed for align and friends

TABLES

\begin{tabular}{lcr}
Columns: left, centre, right

**a & b & c **
Cells split by &, row ends \\

\usepackage{booktabs}
Professional rules

\begin{table}[htbp] ... \end{table}
Floating table with caption

FIGURES AND REFERENCES

\begin{figure}[htbp] ... \end{figure}
Floating figure

\caption{*<text>*}
Caption inside float

\label{*<key>*}
Name a place (after \caption)

\ref{*<key>*}
Number of labelled item

\centering
Centre inside a float

BIBLIOGRAPHY

\cite{*<key>*}
Cite an entry

\bibliography{*<file>*}
BibTeX database (no .bib)

\usepackage[backend=biber]{biblatex}
Modern bibliography

\addbibresource{*<file>*.bib}
biblatex database

\printbibliography
biblatex output spot

BUILD

latexmk -pdf *<file>*.tex
Build, rerun as needed

latexmk -pdf -pvc *<file>*.tex
Rebuild when files change

pdflatex *<file>*.tex
Single pass to PDF

xelatex *<file>*.tex
Unicode and system fonts

RECIPES

Minimal article

```
\documentclass{article}
\usepackage[margin=2.5cm]
{geometry}
\begin{document}
Hello, $E = mc^2$.
\end{document}
```

Figure with caption and ref

```
\begin{figure}[htbp]
  \centering
  \includegraphics[width=.
8\linewidth]{plot.pdf}
  \caption{Results}
  \label{fig:res}
\end{figure}
See Figure~\ref{fig:res}.
```

Cited article, biblatex

```
\usepackage[backend=biber]
{biblatex}
\addbibresource{refs.bib}
...
As shown by
\textcite{knuth84}.
\printbibliography
```