LaTeX Typeset documents

START HERE

`\documentclass{article}`
Pick the document type

`\begin{document} ... \end{document}`
Body goes between these

`\section{<title>}`
Start a section

`\textbf{<text>}`
Bold text

`$<formula>$`
Inline math

`\begin{itemize}`
Bullet list

`\label{<key>} \ref{<key>}`
Cross-reference

`latexmk -pdf <file>.tex`
Build the PDF

.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

`\subsection{<t>}`
Subsection

`\section*{<t>}`
Unnumbered section

`\tableofcontents`
Insert table of contents

`\input{<file>}`
Include another file inline

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

`\usepackage{hyperref}`
Clickable links; load last

`\usepackage[<l>]{babel}`
Language, hyphenation

`\newcommand{\<n>}{<def>}`
Define your own macro

TEXT

`\textbf{<text>}`
Bold

`\textit{<text>}`
Italic

`\emph{<text>}`
Emphasis

`\texttt{<text>}`
Monospace

`\footnote{<text>}`
Footnote

`\\`
Line break

`\newpage`
Page break

`\begin{center} ... \end{center}`
Centre content

`\url{<url>} \href{<url>}{<text>}`
Links (hyperref)

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

LISTS

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

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

`\begin{description} \item[<term>] <a> \end{description}`
Term list

MATH

`$ a^2 + b^2 $`
Inline math

`\[ <formula> \]`
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

MATH (cont.)

`\alpha \beta \pi \Delta`
Greek letters

`\left( ... \right)`
Auto-sized delimiters

`\text{<words>}`
Text inside math

`\begin{pmatrix} a & b \\ c & d \end{pmatrix}`
Matrix

`\usepackage{amsmath}`
Needed for align and friends

TABLES

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

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

`\hline`
Horizontal rule

`p{4cm}`
Fixed-width wrapping column

`\multicolumn{2}{c}{<t>}`
Span columns

`\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

`\autoref{<key>}`
Ref with type word (hyperref)

`\centering`
Centre inside a float

BIBLIOGRAPHY

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

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

BIBLIOGRAPHY (cont.)

`\bibliographystyle{plain}`
BibTeX style

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

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

`\printbibliography`
biblatex output spot

`@article{<key>, title={...}, author={...}}`
Entry in .bib file

BUILD

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

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

`latexmk -c`
Remove aux files, keep PDF

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

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

`lualatex <file>.tex`
Unicode, Lua scripting

`latexmk -pdfxe <file>.tex`
Build with XeLaTeX

`texdoc <package>`
Open a package manual

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
```