LaTeX Typeset documents

START HERE

\documentclass{article}
Pick the document type

$<formula>$
Inline math

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

\begin{itemize}
Bullet list

\section{<title>}
Start a section

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

\textbf{<text>}
Bold text

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

TEXT (cont.)

\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
```