LaTeX Cheatsheet for TeXit

The TeXit Community

LaTeX is a system for typesetting scientific documents. The documents are written in plan text source and then *compiled* to produce a graphical output (as a PDF or an image). The document can contain formulae and figures, written in the LaTeX language, which are then rendered appropriately.

Regular text will be rendered as itself, but the following punctuation symbols have special meaning: The backslash symbol (\) is used for "commands" or "macros" which insert special symbols or notation into the text. Braces (`{` and `}`) are used to group symbols together into a block. Dollars (`$` and `$$`) are used to include formulae in the text.

There are two general modes of operation: "math mode" is used for formulae, and "text mode" is used for text. Formulae can be surrounded by single dollars to be included in the text "inline", for example `$a + b = c$` produces: $a + b = c$. Double dollars render a large formula in "display style", which inserts line breaks around the formula, and also has an effect on how some notation is rendered. For example `$$a + (b + c) = d$$` produces:

$$a + (b + c) = d$$

As may be evident, most symbols (namely `!`, `'`, `(`, `)`, `*`, `+`, `,`, `-`, `.`, `/`, `:`, `;`, `<`, `=`, `>`, `?`, `[`, `]`, `|`) are rendered as themselves, however the commands in the following tables can be used to render other, more interesting kinds of symbols. To write literal braces and dollars, `\{`, `\}`, and `\$` can be used respectively.

To place a subscript or a superscript, `_` and `^` can be used respectively. For example, `a^b` is a^b and `a_b` is a_b. To place more than one character in a sub- or superscript, the expression can be surrounded with `{` and `}`: `a^{b+c}` produces a^{b+c}.

The `\frac{}{}` command[1] renders a fraction (e.g. `\frac{a}{b}` is $\frac{a}{b}$), and `\sqrt{}` renders a square root (e.g. `\sqrt{a}` is $\sqrt{a}$). Order can be specified by writing e.g. `\sqrt[3]{a}` for $\sqrt[3]{a}$.

Sums are typeset with `\sum`, e.g. `\sum_{i=0}^{n} i^2` produces $\sum_{i=0}^{n} i^2$. In "display style", subscripts and superscripts on `\sum` are rendered differently; the same formula produces:

$$\sum_{i=0}^{n} i^2$$

This behaviour is an example of a "big operator". Others include `\prod`, `\lim`, `\bigcap`, etc.

Regular parentheses do not scale around a large expression, producing outputs like $(\frac{a}{b})$. Commands `\left` and `\right` can be used to produce a pair of parentheses (or other bracket-like symbols) that scales with the expression between them. The commands are followed by the type of bracket (like `(` or `[`), for example `\left( \frac{a}{b} \right)` produces $\left(\frac{a}{b}\right)$. The `\left` and `\right` commands have to be balanced, but the exact bracket-like characters used don't have to match, allowing for examples like $\left(-\infty, \frac{a}{b}\right]$.

In math mode, letters are *italicised* by default, as that is the convention for variable names. To typeset operation names in roman font, they should be put inside `\operatorname{...}`. Likewise, `\mathbb{...}` is used to render letters in the "blackboard" font, e.g. $\mathbb{R}$ is produced by `\mathbb{R}`. Other available fonts include `\mathcal{...}` for calligraphic, `\mathscr{...}` for script, `\mathfrak{...}` for fraktur, and `\mathsf{...}` for sans-serif.

[1] While it is definitely possible to write `\frac 1 2` for $\frac{1}{2}$, it is somewhat customary to always surround arguments to macros with braces.

Simple Algebra

`\div`	$\div$
`\frac{a}{b}`	$\frac{a}{b}$
`\times`	$\times$
`a \cdot b`	$a \cdot b$
`a^{b}`	a^b
`a_b`	a_b
`\pm`	$\pm$
`\mp`	$\mp$
`\sqrt{a}`	$\sqrt{a}$
`\sqrt[b]{a}`	$\sqrt[b]{a}$
`\neq,\not=`	$\neq$
`\approx`	$\approx$
`\sim`	$\sim$
`\propto`	$\propto$
`\leq,\le`	$\leq$
`\geq,\ge`	$\geq$
`\ll`	$\ll$
`\gg`	$\gg$
`\cong`	$\cong$
`\lvert a \rvert`	$\lvert a \rvert$
`\lfloor a \rfloor`	$\lfloor a \rfloor$
`\lceil a \rceil`	$\lceil a \rceil$
`\bar{a}`	$\bar{a}$
`\Re`	$\Re$
`\Im`	$\Im$
`a \circ b`	$a \circ b$
`\mathbb{N}`	$\mathbb{N}$

Set Theory & Logic

`\in`	$\in$
`\notin`	$\notin$
`\varnothing`	$\varnothing$
`\subset`	$\subset$
`\subseteq`	$\subseteq$
`\supset`	$\supset$
`\supseteq`	$\supseteq$
`\cup`	$\cup$
`\cap`	$\cap$
`\setminus`	$\setminus$
`\forall`	$\forall$
`\exists`	$\exists$
`\implies`	$\implies$
`\iff`	$\iff$

Simple Geometry

`\parallel`	$\parallel$
`\nparallel`	$\nparallel$
`\perp`	$\perp$
`\angle`	$\angle$
`\triangle`	$\triangle$
`\square`	$\square$
`\overrightarrow{AB}`	$\overrightarrow{AB}$
`\overline{AB}`	$\overline{AB}$

Greek Letters

`\alpha`	α
`\beta`	β
`\gamma`	γ
`\Gamma`	Γ
`\delta`	δ
`\Delta`	Δ
`\epsilon`	ϵ
`\varepsilon`	ε
`\zeta`	ζ
`\eta`	η
`\theta`	θ
`\vartheta`	ϑ
`\Theta`	Θ
`\iota`	ι
`\kappa`	κ
`\lambda`	λ
`\Lambda`	Λ
`\mu`	μ
`\nu`	ν
`\pi`	π
`\Pi`	Π
`\rho`	ρ
`\sigma`	σ
`\Sigma`	Σ
`\tau`	τ
`\upsilon`	υ
`\Upsilon`	Υ
`\phi`	ϕ
`\varphi`	φ
`\Phi`	Φ
`\chi`	χ
`\psi`	ψ
`\Psi`	Ψ
`\omega`	ω
`\Omega`	Ω

Calculus

`\sum`	$\sum$
`\prod`	$\prod$
`\coprod`	$\coprod$
`\infty`	∞
`\to`	$\to$
`\mapsto`	$\mapsto$
`\uparrow`	$\uparrow$
`\downarrow`	$\downarrow$
`\prime`	$\prime$
`\partial`	∂
`\dot{a}`	$\dot{a}$
`\ddot{a}`	$\ddot{a}$
`\int_{a}^{b}`	$\int_a^b$
`\iint`	$\iint$
`\iiint`	$\iiint$
`\oint`	$\oint$
`\nabla`	∇