

L^AT_EX Tips

Helpful websites

Beginner tutorials:

<http://www.andy-roberts.net/writing/latex>

Tutorials and general reference:

<http://en.wikibooks.org/wiki/LaTeX>

List of commands:

<http://www.personal.ceu.hu/tex/words.htm>

List of symbols: <http://ctan.mackichan.com/info/symbols/comprehensive/symbols-letter.pdf>

Hand-drawn symbol recognition:

<http://detexify.kirelabs.org/classify.html>

Q & A Forum: <http://tex.stackexchange.com/>

LaTeX source code for this document:

svn+ssh://magicvcs.et.byu.edu/home/svnroot/MAGICC/trunk/people/Brandon_Carroll/LatexTips

Common packages

Import a package with `\usepackage{packageName}`

amsmath – Math typesetting and environments

amssymb – Lots of symbol definitions.

amslatex – Provides the multiline environment.

graphicx – Used to include graphics, images, etc.

hyperref – Creates bookmarks and clickable links in the pdf.

The align environment

The `&` symbol toggles between signaling alignment and signaling column breaks.

A double backslash (`\\`) starts a new line.

Put `\label` commands before the `\\`.

The `align*` environment omits the equation numbers.

For example,

```
\begin{align}
x_1&=a+b & & x_2=c+d \label{eq1} \\
x_3&=a+b+c+d & & x_3-x_2=x_1 \label{eq2}
\end{align}
```

$$x_1 = a + b \qquad x_2 = c + d \qquad (1)$$

```
x_3 = a + b + c + d \qquad x_3 - x_2 = x_1 \qquad (2)
```

Figures

Include the `graphicx` package: `\usepackage[pdftex]{graphicx}`.

You can specify the folders that the figures are in:

```
\graphicspath{{folder1/}{folder2/figs/}}.
```

Tell it what file types to look for with

```
\DeclareGraphicsExtensions{.pdf,.jpg,.png}.
```

Example:

```
\begin{figure}
\centering
\includegraphics[width=3in]{filename.pdf}
\caption{Caption text here}
\label{fig1}
\end{figure}
```

The `\label` command must come after the `\caption` command for references to work correctly.

If you put the `\caption` command before the `\includegraphics` command, then the caption will appear above the figure.

Matrices

Use `&` to break columns and `\\` to start a new line.

Environments: `matrix` (no brackets), `bmatrix` (square brackets),

`Bmatrix` (curly braces), `pmatrix` (parentheses), `vmatrix`

(vertical bars), and `Vmatrix` (double vertical bars).

Example:

```
\( \begin{bmatrix}
a & b & c \\
d & e & f
\end{bmatrix} \)
```

Spacing

The `\!` command produces a small negative horizontal space (so `a\!a` produces aa).

The following commands produce increasing amounts of horizontal space: `\`, `\:`, `\;`, `\quad`, `\qquad`.

The `\hspace` command produces a specified amount of horizontal space (so `|\hspace{.5cm}|` produces | |).

The `\vspace` command produces a specified amount of vertical space (the amount can be negative).

Units of length that can be used: `pt`, `mm`, `cm`, `in`, `ex`, `em`.

Custom commands

Define new commands with

```
\newcommand{\commandName}{commandDefinition}.
```

This will cause any instances of `\commandName` to be replaced with `commandDefinition`.

To define commands that accept parameters, specify the number of parameters and use `#N` in the command definition to substitute in the parameter:

```
\newcommand{\commandName}[numParams]{definition}.
```

Example (a command to format an indefinite integral):

```
\newcommand{\indefint}[2]{\ensuremath{\int\!^{\!#1} \, \mathrm{d} \ #2}}
```

causes `\indefint{x(t)}{t}` to be formatted as $\int x(t) dt$.

Custom math operators

You can use the `\DeclareMathOperator` command to define your own math operators (like the built in `\sin` and `\lim` operators).

The `\DeclareMathOperator*` version of the command will put superscripts and subscripts above and below the operator (like `\lim` does).

Example: `\DeclareMathOperator*\limInMean{1.\!^{\!i}.\!^{\!m}}` causes `\limInMean_{x \rightarrow 0} f(x)` to produce $\lim_{x \rightarrow 0} f(x)$.

Miscellaneous tips

You usually need to compile several times for all the cross references to get resolved (no warnings).

The `\input{fileName}` command will insert all the text from `fileName.tex` into the document when compiled.

The `\today` command will be replaced with the current date when the document is compiled.

The `\ensuremath` command can be used to define commands that work either in or out of math mode. E.g.

```
\newcommand{\azimuth}{\ensuremath{\alpha_{az}}}
```

`\mathcal{ABCDEF}` gives $ABCDEF$.

`\mathbb{ABCDEF}` gives $ABCDEF$.

You can easily set margins with the `geometry` package:

```
\usepackage [top=1in,left=.5in,right=.5in,
bottom=1in]{geometry}
```

LaTeX ignores spaces after command names with no parameters.

You can force spaces with either `_` or by placing `{}` after the command.

Don't just type words while in math mode—it will space the letters like a bunch of single letter variables multiplied together. Put words in a `\mathit{}` or `\mathrm{}` command depending on if they should be italicized (variable names) or romanized. I.e., `variablemin` should not look like `variablemin`.

If missing packages don't download automatically, you can use the MiKTeX Package Manager to download them manually.

In TeXnicCenter, F9, F10, and F11 cycle through errors, warnings, and bad boxes respectively.

In TeXnicCenter, ctrl-q comments out the selected block of code and ctrl-w uncomments.