

# Latex Tutorial

9/10/2020

# Outline

- 1 Basics
- 2 Useful Packages
- 3 Other resources

# Basics

- 1 Latex is a stable dispersion (emulsion) of polymer microparticles in water. (Wikipedia)
- 2 LaTeX is pronounced "Lay-tech" and will henceforth be written as "latex" when convenient.

# Templates

- 1 Lots of templates online, feel free to pick around till you get one you like.

# Compilers

- 1 [www.overleaf.com](http://www.overleaf.com) is pretty good. Benefits include easy collaboration and auto-complete.
- 2 `texshop` or other offline compilers have the advantage that there's no internet, so it can sometimes be easier to compile larger files or ones that have lots of images.

# Starting out

The following document compiles:

```
\documentclass[12pt]{article}
\begin{document}
Hello world.  $25=5^2$ .
\end{document}
```

# Packages

Often you want to do something cool and chances are someone else already did.

To add a document, before the `\begin{document}` line add something like: `\usepackage{amsmath}`

This package gives you lots of math symbols, for instance  $\mathbb{R}$  is described by

`$$\mathbb{R}$$`

# Physics

The "physics" package has slightly simpler commands for matrices, derivatives and more.

```
\mqty[...] or \mqty(...) instead  
of \begin{pmatrix}...\end{pmatrix}  
and \begin{bmatrix}...\end{bmatrix}
```

Similarly, partial derivatives can be typed faster,

```
\dv[2]{x}, \pdv{f}{x}, \pdv{f}{x}{y}
```

turns into

$$\frac{d^2}{dx^2}, \frac{\partial f}{\partial x}, \frac{\partial^2 f}{\partial x \partial y}$$

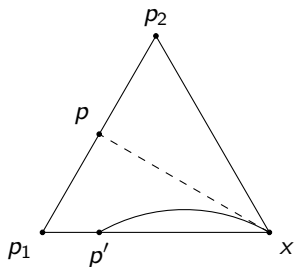
Short summary pdf found online:

[mirrors.ibiblio.org/CTAN/macros/latex/contrib/physics/physics.pdf](http://mirrors.ibiblio.org/CTAN/macros/latex/contrib/physics/physics.pdf)



## tikz

In short you can make more professional sketches, like the following.



## graphicx

It's pretty easy to insert images with

```
\includegraphics [width=50mm] {figure.png}
```

Example:

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**Welcome to the Cornell Math Club**

We are dedicated to making mathematics accessible and fun to all Cornell students, and to enhancing the experience of undergraduate math study.

**We organize:**

- Various talks given by Cornell students and faculty
- Weekly meetings in Muller 5th Floor Lounge (Muller 532) open on Thursdays consisting of puzzles or game sessions, always with pizza.
- Annual Krewel Lectures delivered by prominent mathematicians from other institutions.
- An [ads page here](#). I am pretty sure we do not sell your data to google but there's no way to know for sure. Contact the webmaster to purchase an ad spot on this page.
- A compilation of online [resources](#) on this site.
- Other miscellaneous mathy undergraduate events.
- COVID-19 UPDATE: We are still meeting weekly at 4pm EDT. The meetings are now on Zoom, the link to which is emailed to the listserve every week. To join the listserve email [rho95@cornell.edu](mailto:rho95@cornell.edu).

To see a full list of upcoming and past events, please visit the [events](#) page. If you have any questions please see the [contact](#) page. Finally, if you are interested in meeting and/or seeing cool gifts you can visit a previous version of this site [here](#).

**Upcoming and Recent Events**

# enumitem

Often there will be multiple parts in a math problem. “enumitem” package gives you a nice way to do this.

```
\begin{enumerate}[label=\alph*]  
  \item Hello  
  \item Goodbye  
\end{enumerate}
```

That compiles to

- a** Hello
- b** Goodbye

# Need to find a symbol?

- 1 If you can draw it but want the code - detexify (<https://detexify.kirelabs.org/classify.html>)
- 2 If you know the common name, googling is fairly effective (or use DuckDuckGo for more privacy and lower quality)

# Spacing

`\\` is short for the newline command.  
`\quad` and `\qquad` insert 4 and 8 spaces,  
which can be useful for equations etc.

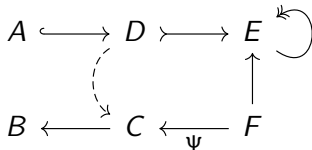
# Commutative Diagrams

tikz-cd is solid but can be time consuming.

Highly recommend <https://tikzcd.yichuanshen.de/>.

It translates drawings into the package tikz-cd.

Example (took 30 seconds to draw):



# Presentations with Beamer

- 1 This slideshow was created in Beamer.
- 2 If slides aren't compiling try adding "fragile" tag

```
\begin{frame}[fragile]{title}
```

- 3 If you would like, copy and paste this code to get started.

# Macros

Certain things are sometimes annoying to type. You can add your own command by something like

```
\newcommand{\R}{\mathbb{R}}
```



## Dynamic updating

$$3 + 4 = 7 \tag{1}$$

Look at equation (1).

Code for the above stuff:

```
\begin{equation}
3+4=7
\label{hello}
\end{equation}\
```

You can do similar things with theorems etc. by adding

```
\label{falsetheorem}
```

and then reference it by

```
The result follows from Theorem \label{falsetheorem}
```



# Bibliographies

- 1 There's a couple ways of doing bibliographies.