# Some LaTeX examples

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## 1 Mechanics

This file contains some examples to get you started using LaTeX to typeset mathematics. It is the premiere software for technical publications. Good places to get started with tutorials:

- `http://www.latex-tutorial.com/`
- `http://www.stdout.org/~winston/latex/latexsheet.pdf`

To compile a LaTeX file, `myfile.tex` to `myfile.pdf`, in the labs, simply enter the following command in a terminal window:

```
pdflatex myfile.tex
```

or use a GUI such as TexWorks or TexStudio.

You can also get your LaTeX processed online, for example, at

- `https://www.overleaf.com/`
- `www.sharelatex.com`

## 2 Some example text

Here is some inline math: $\sum_{i=1}^{n} i^2$ and here is the same thing with display math:

$$\sum_{i=1}^{n} i^2$$

Here is a set of equations lined up nicely:

$$\begin{aligned}(a+b)^2 &= (a+b)(a+b) \\ &= a(a+b)+b(a+b) \\ &= a^2+ab+ba+b^2 \\ &= a^2+2ab+b^2\end{aligned}$$

You can talk about the real numbers, $\mathbb{R}$, the integers $\mathbb{Z}$, the rational numbers $\mathbb{Q}$, and the natural numbers, $\mathbb{N}$, using nice fonts. Notice how I made new commands for some of these in the preamble, to simplify typing. Here is an enumerated list:

1. $\mathcal{P}(\{1,2,3\}) \subseteq \mathcal{P}(\{1,2,3,4\})$
2. $\bigcup_{i\in\mathbb{N}} i^2 = \{0,1,4,9,\ldots\}$
3. $$\bigcap_{i\in\mathbb{N}} i^2 \neq \{0,1,4,9,\ldots\}$$

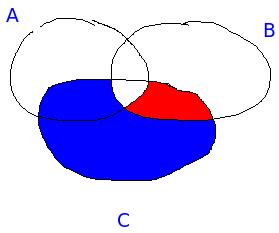
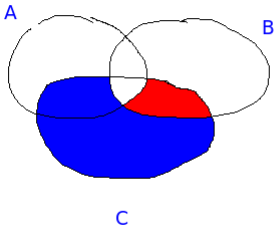



Figure 1: A diagram of some sets.

## 3 Figures

You can also include and scale figures. I drew the picture shown in Figure 1 with a simple paint program, saved it as a `.png` file, and imported it into this document.




You can also include figures inline, like this: but it looks weird sometimes.

Later on, we'll see how to make spectacular diagrams using the `tikz` package.