

Mathematical Software - Introduction

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- 1 What?
 - Latex
 - Sage

- 2 When?

- 3 How?

What

- **Latex** for writing scientific text
- **Sage** for computations

L^AT_EX



L^AT_EX

- A typesetting system, has been around since the 1980s
- Currently the best way to write scientific texts (Math, Physics...)
- Can be used for lecture notes, homework, articles, books, graphics (with TikZ), this presentation...
- “What you get is what you *mean*”, rather than what you see

Latex - Example

An equation like this:

$$e^x = \sum_{n=0}^{\infty} \frac{x^n}{n!} \\ = 1 + x + \frac{x^2}{2} + \frac{x^3}{6} + \dots$$

is written in LaTeX as:

```
\begin{align*}
e^x &= \sum_{n=0}^{\infty} \frac{x^n}{n!} \\
&= 1 + x + \frac{x^2}{2} + \\
&\quad \frac{x^3}{6} + \dots
\end{align*}
```



- Free and open source Mathematical software
- Basically python with a lot of Math libraries
- Builds up on existing software such as Pari/GP, NumPy, R...
- Popular for Computational Algebra (Number Theory, Cryptography...)

When

February 19	14:00 – 17:30	Introduction, LaTeX fundamentals
March 12	14:00 – 17:30	More advanced LaTeX topics
March 26	14:00 – 17:30	LaTeX: presentations, graphics
April 2	14:00 – 17:30	??? (LaTeX or Sage)
April 23	14:00 – 17:30	Sage (???)
May 7	14:00 – 18:15	Sage (???)
May 21	14:00 – 18:15	Sage (???)

- **Remote teaching** at least until April 2 included (probably always).
- **Learn by doing** graded homework (4-5 assignments), non-graded exercises, free practice. No final exam.