This is LaTeX

A playground

Astro

November 2023

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1 Introduction

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Hello world! I am groot. The flag illustrated in figure (1) is pretty . $e^{i\pi} + 1 = 0$ where e is:

$$e = \lim_{n\to\infty} \left(1 + \frac{1}{n}\right)^n = \lim_{n\to\infty} \frac{n}{\sqrt[n]{n!}} = \sum_{n=0}^{\infty} \frac{1}{n!} \tag{1}$$

This is a tcolorbox

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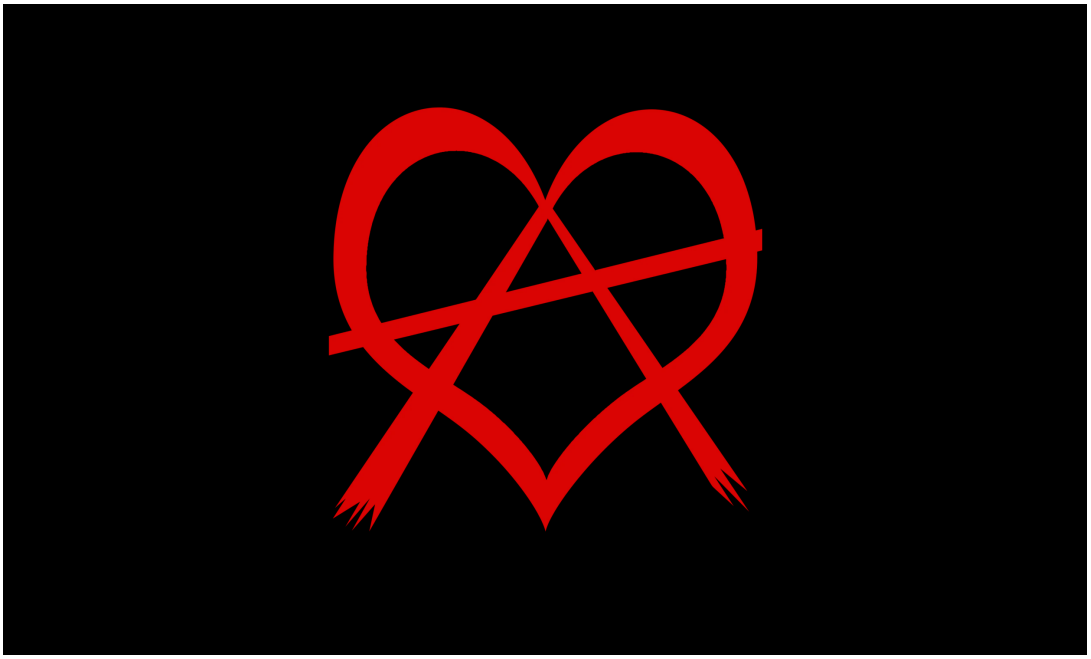

FIGURE 1 – relationship anarchy

Proposition 1.1. $\forall x, y \in \mathbb{R}^n, \quad \big|\|x\| - \|y\|\big| \leq \|x - y\|.$

Démonstration. Ecrivons $x = x - y + y$, alors par l'inégalité triangulaire on a

$$\|x\| = \|x - y + y\| \leq \|x - y\| + \|y\| \iff \|x\| - \|y\| \leq \|x - y\|.$$

Réciproquement,

$$\|y\| = \|y - x + x\| \leq \|y - x\| + \|x\| \iff \|y\| - \|x\| \leq \|y - x\| \iff \|x\| - \|y\| \geq -\|x - y\|.$$

On a donc $-\|x - y\| \leq \|x\| - \|y\| \leq \|x - y\|$. Ce qui montre que $\big|\|x\| - \|y\|\big| \leq \|x - y\|$. □

1. equation (1) is interesting
   (a) bla
   (b) bla
2. bla

2 Chapitre 1

Théorème 2.1 (Chapter 1)**.** *this is chapter 1.*
Nam dui ligula, fringilla a, euismod sodales, sollicitudin vel, wisi. Morbi auctor lorem non justo. Nam lacus libero, pretium at, lobortis vitae, ultricies et, tellus.

Démonstration. the proof is left as an exercise to the reader □

Corollaire 2.2. *Nam dui ligula, fringilla a, euismod sodales, sollicitudin vel, wisi. Morbi auctor lorem non justo. Nam lacus libero, pretium at, lobortis vitae, ultricies et, tellus.*

$$\iiint_a^b f(x, y, z)\, dx\, dy\, dz \tag{2}$$

- this is **bold text**

- bla
  - $\rightleftharpoons$ bla

- this is *italic text*
- this is underlined text
- L'équations (1) et (2) sont intéressantes

$$x \notin \mathbb{R} \text{ or } \mathbb{R}^{2\times 3}$$

header	column 1 (m/s)	column 2 (s)
cell 0	cell 1	cell 2
cell 0	cell 1	cell 2
cell 0	cell 1	cell 2
cell 0	cell 1	cell 2

TABLE 1 – this is a table

3 Including TeX files

When to use `\input` or `\include`?

3.1 Input

The `\input{<filename>}` macro is basically the same as pasting the target code where the command was used.
Mentionable properties of `\input` are:

- You can use `\input` basically everywhere with any content. It is usable in the preamble, inside packages and in the document.
- You can nest `\input` macros. You can use `\input` inside a file which is read using `\input`.
- The only thing `\input` does is to input the file. You don't have to worry about any side effects, but don't get any extra features.

3.2 Include

`\include` does basically the following thing:

- It uses `\clearpage` [1] before and after the content of the file. This ensure that its content starts on a new page of its own and is not placed together with earlier or later text.
- It opens a new .aux file for the given file. There will be a filename.aux file which contains all counter values, like page and chapter numbers etc...(so they can be compiled separately). Such *part* .aux files are read by the main .aux file.
- It then uses `\input` internally to read the file's content.

Mentionable properties of `\include` are:

- It can't be used anywhere except in the document and only where a page break is allowed. Because of the `\clearpage` and the own .aux file `\include` doesn't work in the preamble, or inside packages. Using it in restricted modes or math mode won't work properly, while `\input` is fine there.
- You can't nest `\include` files. You can't use `\include` inside a file which is read by `\include`.
- **Biggest benefit:** You can use `\includeonly{<filename1>,<filename2>,...}` in the preamble to only include specific `\include` files. Because the state of the document (i.e. above mentioned counter values) was stored in an own .aux file all page and sectioning numbers will still be correct. This is very useful in the writing process of a large document because it allows you to only compile the chapter you currently write on while skipping the others. There is also the excludeonly package which provides an `\excludeonly` to exclude only certain files instead of including all other files.

A Appendix

1. `\clearpage` is just like `\newpage` but it forces float objects to print before the new section.