

Session 2. Text and Math

Digital Skills for Research

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1 Explore the interface of your desktop T_EX editor

- line numbers are useful for fixing errors
- use the toolbar to insert typical commands, if you prefer

2 Text formatting

2.1 Languages

International language support

```
\usepackage[T1, T2A]{fontenc}
\usepackage[french, russian, main=english]{babel}
```

See specific packages names for individual languages [here](#).

For example, you need `\usepackage{arabxetex}` and `\usepackage[LFE, LAE]{fontenc}` for Arabic.

T1 encoding for Latin script

T2A encoding for Cyrillic script

- You might want to install languages to your **local** T_EXdistribution on Linux with
`sudo apt install texlive-lang-polish`
or install them all `sudo apt-get install -y texlive-lang-all`
- You might need to specifically import fonts for other languages.

- NB! main (or last one) in `\usepackage[french,russian,main=english]{babel}` is the language for automatic structural elements (e.g. Contents)
- In some templates short text snippets in non-main language are inserted with `\foreignlanguage{spanish}{.}`.

Examples in Spanish and Russian:

Sección Introductoria

Спасибо.

Sección Introductoria Спасибо.

2.2 Fonts and colours

font style roman (serif), bold, italics, typewriter, sans serif, small caps respectively in

`\textrm`, `\textbf`, `\textit`, `\texttt`, `\textsf`, `\textsc`

e.g. ENCYCLOPEDIA GALACTICA

Don't Panic

font size `\tiny`, `\scriptsize`, `\footnotesize`, `\small`, `\normalsize`, `\large`, `\Large`, `\LARGE`, `\huge`,

e.g. cf. `\huge{text formatting}` and `\tiny{text formatting}`:

text formatting

text formatting

underline Google strikethrough!

font colour `{\color{red!50!white}your_coloured_text}`

e.g. my pink text

2.3 Special characters

The following characters are reserved to have special meaning in L^AT_EX:

`$` `%` `&` `~` `^` `{` `}` `_` `\`

To print them literally you need to escape them with backslash (`\`), except

- for `\` itself use `\backslash`
- for `~` and `^` Use them inside `\verb|`

Formatting conventions:

- double quotes: tilde key (left uppermost key under Esc) without SHIFT and single quote twice → “ and ”
- `\lq` and `\rq` or tilde key + single quote → ‘ and ’ or ‘ and ’
- non-breaking space (SHIFT + tilde key): Fig.`\ref{fig:logo}`
- dots: `\ldots` → ...
- dash: `--` → –
- superscripts and subscripts: `2^2` and `C0_2` → 2², CO₂
e.g. Proceedings of the 11th conference...
- accents: `\^{a}`, `\'o`, `\v{c}`, `\"e`, `\~o` → â, ó, č, ë, ã
- language-specific ligatures: `\ss`, `\l`, `\L` → ß, ł, Ł

Useful tool: [Detexify](#) (**CLICK ME! I am linked!**) symbol table and classifier

3 Math

3.1 Mathmode

- inline: `$your_formula$`
- on a separate line: `\[your_formula\]`
- special environment with a counter in label: `\begin{equation}\label{eq:entropy} ... \end{equation}`

This formula $f(x) = 5x$ is incorporated in the body of text.

This is the same formula on a separate line:

$$f(x) = 5x$$

This is the same formula in the environment (notice the number on the right/left!). See equation 1. You can move the number to the left by adding `leqno` as an optional argument to the class definition `\documentclass[a4paper,11pt,leqno]{article}`

(1) $f(x) = 5x$

3.2 Fractions

`\[\frac{1+\frac{4}{2}}{6} = 0,5\]`

$$\frac{1 + \frac{4}{2}}{6} = 0,5$$

3.3 Brackets

`\[\left(2+\frac{9}{3}\right) \times 5 = 25 \]`

$$\left(2 + \frac{9}{3}\right) \times 5 = 25$$

$$[2 + 3]$$

`\[\{2+3\} \]`

$$\{2 + 3\}$$

3.4 Standard functions

`$\sin x = 0$, $\cos x = 1$, $\ln x = 5$` $\sin x = 0, \cos x = 1, \ln x = 5$

3.5 Symbols

`$2\times 2 \neq 5$`

$2 \times 2 \neq 5$

$A \cap B, A \cup B$

3.6 Characters from other scripts

ϵ , ϕ

$\Phi = 1$

ϵ , ϕ

There are useful tools that reduce the sufferings:

1. [Online Equation Editor](#)
2. **Copy formatted formulas from html source code** (Inspect → Copy → Copy element):
[Second Law of Thermodynamics](#)

$$dS = \frac{\delta Q}{T} - \frac{1}{T} \sum_j \Xi_j \delta \xi_j$$

Task 2. Reproduce a pdf formatting, inc. formulas

- Reproduce text formatting on this [page](#)
- Link your resulting pdf for Task 2 in the [Achievement Tracker](#)