

# An Introduction to L<sup>A</sup>T<sub>E</sub>X

# Outline

- 1 Introduction
- 2 How to Get  $\text{\LaTeX}$
- 3 Text Mode
- 4 Math Modes
- 5 Document Structure
- 6 Extra Stuff

# Introduction

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**Proof:** All of these claims are trivial. Those wishing to verify the final claim may download this presentation and all related documents at the following address.

`www.jasonbhill.com/mathematics/latex`

# What is $\text{\LaTeX}$ ?

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- It was created because typesetting of mathematical and other technical documents had become very inconsistent and frustrating.
- It is a scripting/programming language, not WYSIWYG.

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- It is free.
- It makes math formulae easy to write.

# How to Get L<sup>A</sup>T<sub>E</sub>X

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We'll discuss each topic briefly:

- Installing on your own machine.
  - Mac OS-X
  - Linux
  - Windows
- Using Euclid.

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- Grad students Nathan Wakefield and Joshua Wiscons can assist with  $\LaTeX$  and related programs installation/use on Mac OS-X systems.

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- Grad students Tyson Gern and Ryan Grover can assist with  $\text{\LaTeX}$  and related programs installation/use on Windows systems. Grad student Jason B. Hill can assist with installing Linux and  $\text{\LaTeX}$ .

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- All of the Red Hat office desktops have Kile and TeXLive.
- In a pinch, you can also SSH to euclid.

## **Text Mode**

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- By default, while writing  $\text{\LaTeX}$ , you are in text mode.
- While in text mode, you can write mostly anything except:

#	macro parameter symbol
\$	starts/ends inline math-mode
%	comment character
~	non-breaking space character
\	command character
_	math subscript character
{	begin argument delimiter
}	end argument delimiter

The following types of fonts are available in text mode:

- Plain Text
- Roman Font
- Sans Serif Font
- Typewriter Font
- **Bold Font**
- *Italic Font*
- *Slant Font*
- SMALL CAPS FONT

The following font sizes are available.

- tiny
- scriptsize
- footnotesize
- small
- normalsize
- large
- Large
- huge
- Huge



There are several different list environments in  $\text{\LaTeX}$ .

- This is an itemized list.
- This is the second item in this itemized list.

1 We can also enumerate items in our list.

**23b** And we can control how the items are enumerated.

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- To include more than one “thing” as a subscript/superscript, put curly brackets around the entire subscript/superscript.

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## **Inline Math Mode Example:**

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## **Block Math Mode Example:**

```
\[  
\int_0^1 \sin(x) dx  
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```

$$\int_0^1 \sin(x) dx$$

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- Arguments/options are given to a command with { }
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$$\sum_{k=1}^n k^2 = \frac{n(n+1)(2n+1)}{6}$$

is written with the commands

$$\backslash\text{sum}_{\{k=1\}}^n k^2 = \backslash\text{frac}\{n(n+1)(2n+1)\}\{6\}$$

See the  $\LaTeX$  ‘cheat sheet’.

# Math Mode Environments

Various math mode specific environments exist:

- Align and Align\*

$$\begin{aligned}\sum_{k=1}^5 (k^2 + 2) &= (1^2 + 2) + (2^2 + 2) + (3^2 + 2) + (4^2 + 2) + (5^2 + 2) \\ &= 3 + 6 + 11 + 18 + 27 \\ &= 65.\end{aligned}$$

# Math Mode Environments

- Matrices can be drawn with the Array environment.

$$\begin{pmatrix} a & b & c \\ d & e & f \\ g & h & i \end{pmatrix}$$

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- See Section 4 of document.

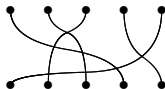
## **Extra Stuff**

Many packages are available to draw diagrams, graphs, etc. These can take some practice. Each package comes with a new set of commands to learn.

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- Various other packages accomplish specific tasks.



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The main commands used in a beamer presentation are:

- `\begin{frame} . . . \end{frame}`
- `\frametitle{This Frame Title}`
- `\pause\uncover{Uncover This Now}`

```
\end{document}
```