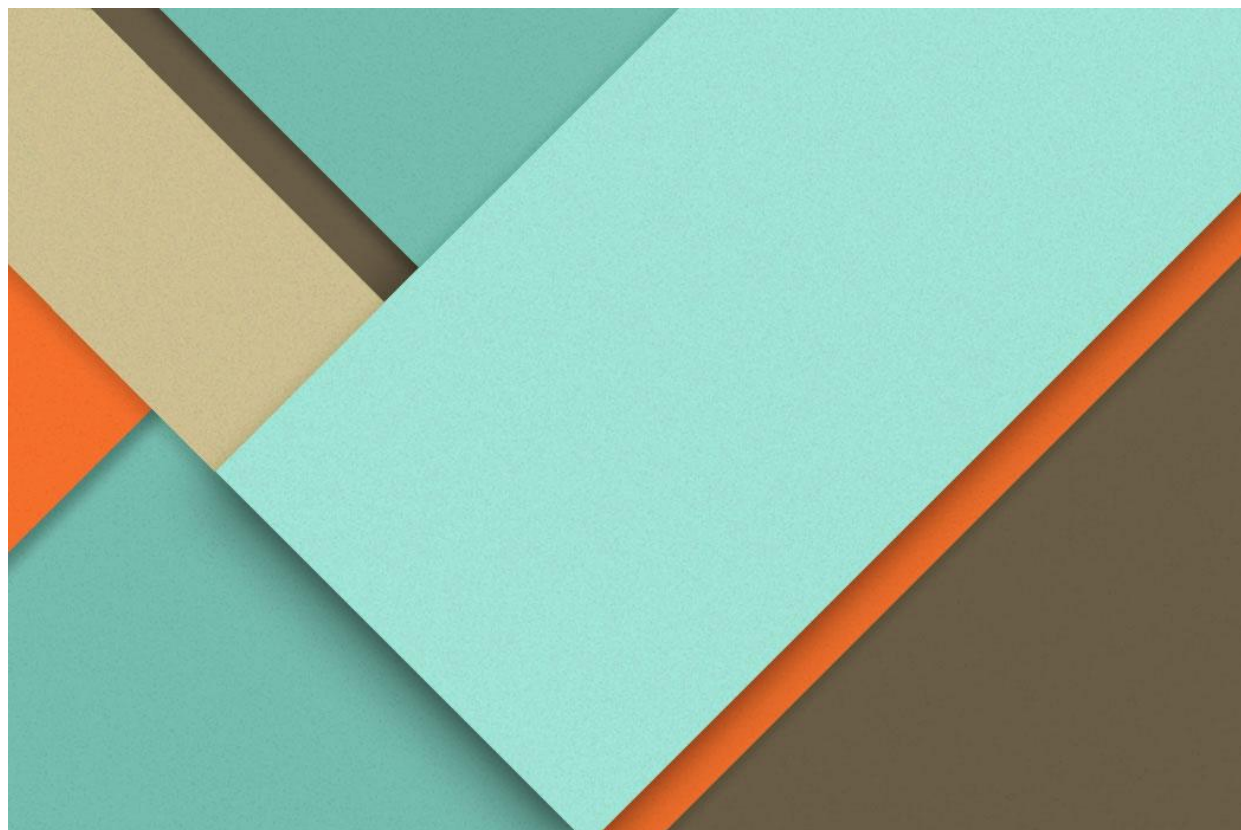




Latex—Beginner's Guide

September 2021

Centennial

National Math Honor Society

Overview

Overleaf is an online, easy to use, collaborative LaTeX editor that allows real-time collaboration in your browser to **create a well-formatted mathematical paper**. It provides a great platform to write out mathematical equations to prepare a professional document. The typesetting language, TeX, is easy to learn and you don't need any previous background knowledge. By the end of this LaTeX guide you will be able to create and write basic LaTeX documents and have the knowledge to start learning how to create more complex documents.

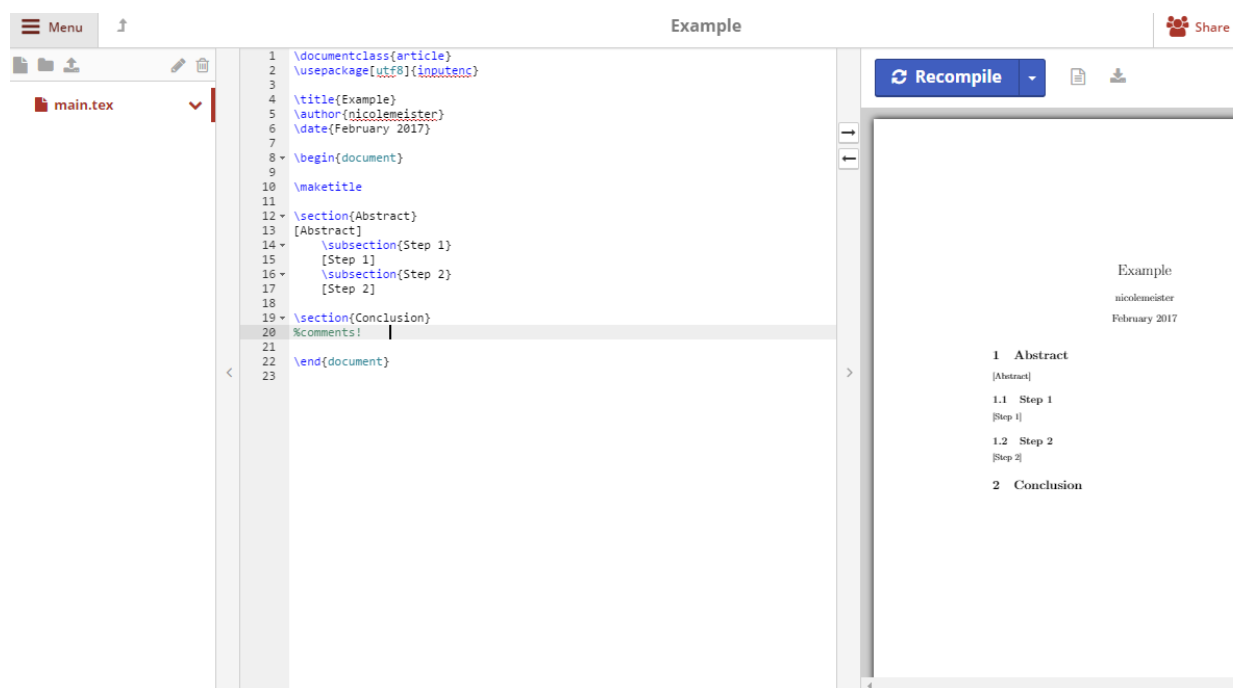
Why Learn LaTeX?

1. Format Math Journal articles ;)
2. Format Mu Alpha Theta Tournament questions (if on the Tournament Committee)
3. Used in universities to write papers for scientific journals
4. Free & Easy to use!

Creating Your First Document

Sign up for [overleaf.com](https://www.overleaf.com)

Register for an account on <https://www.overleaf.com/register> and click on "Create First Project" → "Blank Project".



The leftmost panel manages all the files and can import images. The middle portion is the code editor. The rightmost panel is the area to compile code and view the pdf product.

Introductory Commands

- `\maketitle` → Creates a title with the previous information (title, author, date)
- `\section{section_title}` → Creates numbered sections

- `\subsection{title}` → Creates numbered subsections
- `%` → Leave comments for other editors or as reminders for yourself

Mathematical Functions

The screenshot shows a LaTeX editor interface with a source code window on the left and a preview window on the right. The source code window displays a LaTeX document structure with various mathematical functions. The preview window shows the rendered output of the document, including a title page and two sections: '1 Basic Math Functions' and '2 Conclusion'.

Source Code (main.tex):

```

8 \begin{document}
9
10 \maketitle
11
12 \section{Basic Math Functions}
13 %Enclose all math functions in $ signs
14
15 \noindent Equation: $ 4x + 3 = 23$
16
17 \noindent Fraction: $\frac{3}{4}$
18
19 \noindent Multiplication: $ 4 \cdot 5 = 20$
20
21 \noindent Division: $ 20 \div 5 = 4$
22
23 \noindent Superscript: $ x^{2}$
24
25 \noindent Subscript: $x_{2}$
26
27 \noindent Integral: $\int_{a}^{b} x^2 dx$
28
29 \noindent Derivative: $ \frac{d}{dx}$
30
31 \noindent Square Root: $\sqrt{x}$
32
33 \noindent Summation: $\sum_{n=0}^{\infty} \ln(x)$
34
35 \subsection{Variables and Constants}
36 $\alpha$
37 $\beta$
38 $\gamma$
39 $\delta$
40 $\epsilon$
41 $\pi$
42 \subsection{Equation on a new line}
43 Enclose equations on a new line with two dollar signs
44
45 \noindent Summation: $\sum_{n=0}^{\infty}$
46
47 \noindent Integral: $\int_{a}^{b} x^2 dx$
48
49
50
51 \section{Conclusion}

```

Rendered Output (Example):

Example

nicolemeister

February 2017

1 Basic Math Functions

Equation: $4x + 3 = 23$

Fraction: $\frac{3}{4}$

Multiplication: $4 \cdot 5 = 20$

Division: $20 \div 5 = 4$

Superscript: x^2

Subscript: x_2

Integral: $\int_a^b x^2 dx$

Derivative: $\frac{d}{dx}$

Square Root: $\sqrt{x}$

Summation: $\sum_{n=0}^{\infty} \ln(x)$

1.1 Variables and Constants

$\alpha \beta \gamma \delta \epsilon \pi$

1.2 Equation on a new line

Enclose equations on a new line with two dollar signs

Summation:

$$\sum_{n=0}^{\infty}$$

Integral:

$$\int_a^b x^2 dx$$

2 Conclusion

➤ Enclose all in-line mathematical expressions in dollar signs or $\backslash(\dots \backslash)$

- Equation: $4x + 3 = 23$ or $\backslash(4x + 3 = 23 \backslash)$
- Multiplication: $\cdot$
- Division: $\div$
- Fraction: $\frac{x}{y}$
- Superscript: x^2
- Subscript: x_2
- Integral: $\int_a^b f(x) dx$
- Derivative: $\frac{d}{dx}$
- Square Root: $\sqrt{x}$
- Summation: $\sum_{n=0}^{\infty}$

➤ Variables & Constants

- α
- β
- γ
- δ
- ϵ
- π

➤ Equations in New line: enclose with two $\$$

- Summation: $\sum_{n=0}^{\infty}$
- Integral: $\int_a^b x^2 dx$

For symbols not listed above, they can likely be found online through a Google search.

Images

1. To Upload an Image, select the  upload icon in the top left corner and upload your image(s)
2. Create a new folder  named “images” and drag your uploaded images into that folder
3. In the code editor, before the `\begin{document}` command, type:
 - a. `\usepackage{graphicx}`
 - i. This is the package used to manage images
 - b. `\graphicspath{ {images/} }`
 - i. To tell LATEX that the images are stored in ‘images’ folder
4. In the space where you would like to insert your image:


```
\includegraphics[formatting*]{picture_name}
```

 - a. Formatting:
 - i. Scaling: `[scale = x]`
 1. ex: `\includegraphics[scale = 0.5]{picture_name}` will result in a displayed image that is half the size of the original
 - ii. Dimensions: `[height=xcm, width=y cm]` to alter the dimensions of the image
 1. Ex: `\includegraphics[height=3cm, width=4cm]{picture_name}`
 - iii. Rotation: `[angle=x]` to rotate the image counter-clockwise
 1. `\includegraphics[angle=45]{picture_name}`
 - b. Additional: you are able to caption and label the images

Nicole--Calc BC

Menu

Share History Chat

Recompile

Nicole--Calc BC

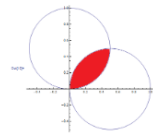
chsmhs
January 2017

1 Mu Alpha Theta Calc BC Multiple Choice

1. Solve $\lim_{x \rightarrow 1} \frac{x^2 - 2x + 1}{x^2 - 1}$

(A) $\ln 2$
(B) $2\ln 2$
(C) $\ln 4$
(D) 0
(E) NOTA

2. Find the area of the intersection of $r = \cos \theta$ and $r = \sin \theta$ graphed below



(A) π
(B) 2π
(C) $\frac{\pi}{4}$

Latex Format for CHS Mu Alpha Theta Questions

Mu Alpha Theta

chsmhs
January 2017

1 Multiple Choice

1. What is 2^3 ?

(A) Answer A
(B) Answer B
(C) Answer C
(D) Answer D
(E) Answer E

2. What is $4x + 3 = 23$?

(A) Answer A
(B) Answer B
(C) Answer C
(D) Answer D
(E) Answer E

2 Short Answer

1. Question 1
Answer: _____

2. Question 2
Answer: _____

Multiple Choice (Individual, Team Round)	Short Answer (Speed-Ciphering Round)
<pre>\begin{enumerate} \item What is 2^3? \begin{enumerate} \item [(A)] Answer A \item [(B)] Answer B \item [(C)] Answer C \item [(D)] Answer D \item [(E)] Answer E \end{enumerate} \item What is $4x + 3 = 23$? \begin{enumerate} \item [(A)] Answer A \item [(B)] Answer B \item [(C)] Answer C \item [(D)] Answer D \item [(E)] Answer E \end{enumerate} \end{enumerate}</pre>	<pre>\section{Short Answer} \begin{enumerate} \item Question 1 Answer: $\rule{1cm}{0.15mm}$ \item Question 2 Answer: $\rule{1cm}{0.15mm}$ \end{enumerate}</pre>

<pre> \item [(C)] Answer C \item [(D)] Answer D \item [(E)] Answer E \end{enumerate} \item What is \$ 4x+3 = 23\$? \begin{enumerate} \item [(A)] Answer A \item [(B)] Answer B \item [(C)] Answer C \item [(D)] Answer D \item [(E)] Answer E \end{enumerate} \end{enumerate} </pre>	<pre> Answer: \$\rule{1cm}{0.15mm}\$ \item Question 2 Answer: \$\rule{1cm}{0.15mm}\$ \end{enumerate} *{enumerate} numbers the questions </pre>
---	---

Notes

- If you are confused about the syntax, feel free to email us (chsnmhs@gmail.com) or search it up online! <https://www.overleaf.com/learn> has great resources and <http://tex.stackexchange.com/> is a great online community