# Introduction to LaTeX for Mathematical Expressions

The goal of the lesson is to become familiar with the TeX language, specifically for the purpose of writing mathematical expressions.

#### 1. Introduction to LaTeX

#### What is LaTeX?

1. LaTeX is a high-quality typesetting system, primarily used for technical and scientific documents. It is particularly powerful for formatting complex mathematical equations and formulas, making it a preferred choice in academia and research.

### What are the advantages of LaTeX?

- 1. **Precision and Control**: LaTeX allows precise formatting of documents and mathematical expressions.
- 2. **Consistency**: LaTeX automatically manages references, labels, and numbering, ensuring consistency throughout your document.
- Professional Quality: Documents created in LaTeX look professional and are publicationready.

### **Getting Started:**

- 1. **Overleaf**: We will use Overleaf, a free online LaTeX editor, which allows you to write and compile LaTeX documents directly in your browser.
  - 1. Sign up at Overleaf.
  - 2. Overleaf offers collaborative features, version control, and a vast library of LaTeX templates.

#### **Basic Document Structure:**

```
\documentclass{article} % Specifies the document class (article, report, book, etc.)
\begin{document} % Begins the content of the document
% Your content goes here
\end{document} % Ends the content of the document
```

- 1. \documentclass{article}: Defines the overall layout and style of the document.
- 2. \begin{document} and \end{document}: Everything between these commands will be included in the output document.

# 2. Writing Basic Mathematical Expressions

#### Inline vs. Display Math

1. Inline Math: For mathematical expressions that appear within a line of text, use \$...\$.

```
1. E.g. E = mc^2 is written as E = mc^2 in LaTeX.
```

- 2. **Display Math**: For standalone equations, use \$\$...\$\$.
  - 1. E.g. To display  $\$\$E = mc^2\$\$$  on its own line, use  $\$\$E = mc^2\$\$$ .

## **Example**

\documentclass{article}
\begin{document}

The equation  $E = mc^2$  is famous in physics. It is so important that we can highlight  $E = mc^2$  by putting it to a separate line.

\end{document}

This code will became:

The equation  $E=mc^2$  is famous in physics. It is so important that we can highlight

 $E = mc^2$ 

by putting it to a separate line.

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