My First LaTeX Document

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1 Introduction

This is my very first LaTeX document. In this document, I've explored some of the fancy features of LaTeX.

1. The Preamble (Header)

   The Preamble of a LaTeX document is declared at the beginning using the following syntax:

   `\title{your-title-here}`

   `\author{name-of-author}`

   `\date{date}`

2. `\maketitle` command

   This command is usually written in LaTeX documents to display the Preamble. Omitting this line in the document will result in the Preamble not being displayed in the document.

3. `\section{your-text-here}` command

   Used to create sections in the document. To avoid the list numbering, the following syntax may be used: `\section*{your-text-here}`

2 Writing Mathematical Formulae

This section contains different (possibly incorrect) formulae, which are written solely to explore LaTeX Syntax.

1. In-line Formula

   The most beautiful equation in math is $e^{i\pi} + 1 = 0$. It relates beautifully, some of the most important constants in math, namely, e, π, 0, and 1.

2. Formula in a single line

- The Euler's constant e has various definitions, some of which include:

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

- Now, let's look at a continued fraction that describes the golden ratio φ:

$$\varphi = \cfrac{1}{1 + \cfrac{1}{1 + \cfrac{1}{1 + \cfrac{1}{1 + \ldots}}}}$$

3. Calculus!

- The following is the derivative of a function:

$$\frac{d}{dx}\left(\frac{sin(x^2)}{n} + cos^2(x)\right) = \frac{2xcos(x^2)}{n} - sin(2x)$$

- $\forall a, b, c \in \mathbb{R}; a \leq c \leq b$,

$$\int_a^b f(x)dx = \int_a^c f(x)dx + \int_c^b f(x)dx$$

4. Linear Algebra!

- Here is a vector:

$$\vec{v} = (v_1, v_2, ..., v_n)$$

- Here is the dot product of two vectors:

$$\vec{v} \cdot \vec{w} = (v_1 w_1, v_2 w_2, ..., v_n w_n)$$

- Here's a matrix:

$$A = \begin{bmatrix} a_{11} & a_{12} & a_{13} \\ a_{21} & a_{22} & a_{32} \end{bmatrix}$$

Conclusion

I find LaTeX to be an easy to use tool. The typeface is easy to learn and grasp. I look forward to having to work in it.