

Introduction to \LaTeX

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1 Introduction

In this workshop, we'll be looking at how to create a basic document in \LaTeX that includes some math. There are a few important things to mention before we get underway:

\LaTeX is not WYSIWYG, or What You See Is What You Get, like Microsoft Word. You must write and compile code to create a document, usu-

2 Document Structure

2.1 A Basic Document

You can do this by simply omitting the commands to create the title and section heading and adding code to create a specially-formatted line in the document:

```
\documentclass{article}
\begin{document}
\bigskip
{\fontfamily{serif}\fontseries{em Set 1}\fontshape{normal}\fontsize{12pt}\today}
\bigskip

```

Hello

Try copying and pasting the command sequence into a document file to see the effect.

2.3 Font Families and Sizes

```
\end{document}
```

The asterisk tells us not to number a section. The same rule applies for equations and other numbered environments.

3 Including Math

There are several ways to include math in \LaTeX .

3.1 Inline Math

One method of including math is "in-line," by using $\$$ symbols around your math. For example, to create the line:

Consider the equation $x^2 + y = 1$

I would type the following:

Consider the equation $x^2+y=1$.

This allows me to include small math objects in a paragraph of text. Try adding an inline expression or equation to your document.

3.2 Equation Environment

You may also use the equation environment. To create the following:

$$x + 1 = y \tag{1}$$

I would use these commands:

```
\begin{equation}
x + 1 = y
\end{equation}
```

Notice that \LaTeX automatically centers your equation and adds a reference number. We can add a label so that we can refer to that equation later:

```
\begin{equation} \label{eu_eqn}
e^{\pi i} + 1 = 0
\end{equation}
```

Equation \ref{eu_eqn} is known as Euler's equation.

The code above should produce the following output:

$$e^i + 1 = 0 \tag{2}$$

Equation 2 is known as Euler's equation.

3.3 Align Environment

Perhaps you want to line up equations on one element, like an equals sign. To create the following,

$$\begin{aligned} y &= 3.1415 \\ x + y &= 21.10 \\ x + (x + 1) &= 5791.1 \\ x &= 0.05 \end{aligned}$$

I would use these commands:

```
\begin{align*}
y&=3.1415 \\
x+y&=21.10 \\
x+(x+1)&=5791.1 \\
x&=0.05
\end{align*}
```

If you try this now, you might get an error message. The `align` environment is part of a package called `amsmath`. If it's not already there, scroll up to the top of your document and add `\usepackage{amsmath}` to the preamble.

Can you figure out how to align on the decimal point instead?

$$y = 3.1415$$

$$x + y = 21.10$$

$$x + (x + 1) = 5791.1$$