1 LaTeX Odds and Ends

\LaTeX{} is a package employing the typesetting language \TeX{} with the goal of separating the logical elements of a document from the actual formatting of those elements. For example, if you have a document with several sections, then you just tell \LaTeX{} the section title for each, and \LaTeX{} figures out how to format the title for you. Or you can tell \LaTeX{} that a certain body of text is a quote or a footnote, and \LaTeX{} will format accordingly. \LaTeX{} works in environments which often are started with a \texttt{\begin{...}} command to begin a particular environment, and and \texttt{\end{...}} command to end the environment. Examples of environments are sections (\texttt{\begin{section}...\end{section}}), enumerated (numbered) points (\texttt{\begin{enumerate} \item...\item...\end{enumerate}}) and itemized (bullet) points (\texttt{\begin{itemize} \item...\item...\item...\end{itemize}}). The whole document is also set apart in this way with a \texttt{\begin{document}} and \texttt{\end{document}} before and after the body of the document.

With that introduction, let us first see how a document is structured. Each document requires a class statement, to declare to what class the document belongs. Typical classes are “article”, “report”, and “book”. Our class designation will be “labreport”. After the class statement, there may be commands setting up various aspects of the formatting, followed by the \texttt{\begin{document}} statement. After the document is entered comes an \texttt{\end{document}} statement. Within the document, paragraphs are separated by a blank line. A document is therefore laid out as (for example using the document class labreport):

\begin{verbatim}
\documentclass{labreport}
\begin{document}
\end{document}
\end{verbatim}

The preamble is a place where some general commands can be given to set up certain formatting parameters, or to invoke packages (such as the graphicx package that will be used to include graphics).

In order to typeset separate paragraphs, simply skip a line. \LaTeX{} will automatically indent the paragraph for you (according to the currently allocated class rules) and typeset the paragraphs with appropriate space in between.

The math environment (“math mode”) is entered and exited by using $\langle$ and $\rangle$ within a paragraph, or $\{ [$ and $]$ to typeset a mathematical formula as a separate line containing the equations. Note also that $\langle$ and $\rangle$ can be replaced by $\$$ on each side of the equation. $\{ [$ and $]$ should not be replaced (with $$$ in place of each) however, because the formatting may be somewhat different. If we write, for example, $\int e^{-x} \, dx$ we will get the separate equation

$$\int e^{-x} \, dx.$$

Note that exponents can be written using the $^\text{ character, e.g.} e^{-x}$ comes out $e^{-x}$. If however we use $\langle$ and $\rangle$, we get the inline formula $\int e^{-x} \, dx$. Greek letters can be written using the backslash before the spelling of the greek letter. For example, a $\lambda$ is typeset using $\langle\lambda\rangle$, and to type an $\alpha$, use $\langle\alpha\rangle$. Many mathematical symbols can be found in the \LaTeX{} guide. Note that the curly brackets $\{ [$ and $]$ are used to enclose “groups”. Some other useful features: fractions can be created using the $\frac{a}{b}$ command, that creates fractions, taking two arguments, the numerator and denominator:

\[ \frac{a}{b} \]
is written $\frac{a}{b}$. Note that the arguments passed to $\frac$ are enclosed in curly brackets. Also, while in math mode, a number of functions such as sin, cos, and log can be written as $\sin$, $\cos$, and $\log$, respectively.

Thus $\sin(\theta)+\log(\cos(\alpha))$ translates into

$$\sin(\theta) + \log(\cos(\alpha)).$$

Note also: anything on a line after a % is a comment.

There are a few other things you will run into. For example, to typeset forward and backward quotes, you cannot simply use the double quote key, because it would be the same for both opening an closing quotes marks. (In order to avoid having to build in context sensitive methods which can err, \TeX uses fixed commands for each symbol.) So to open a quote, you need to use double back quotes (hit the back quote key two times) and for closing quotes, you can either use the double quote character, or twice the single quote character.

That should be enough for now. You can find much more in the \TeX Guide. Also check the physics website for links to further information about \TeX.