

Solutions for the GSNS L^AT_EX Workshop

T_EXniCie, A-Eskwadraat

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1 Exercise 1

Look at the following code.

```
\documentclass{article}

\title{Algebraic Geometry and Feynman Diagrams}
\author{Pepijn de Maat}

\begin{document}

\maketitle
% Maybe I should add a Table of Contents
\clearpage

\section{Introduction} %TODO
This subject is very important for TO DO reasons.

\paragraph{Physical Relevance}
TO DO, something with Cern.

\paragraph{Historical Interest}
TO DO, was there any?

\end{document}
```

1. The author is ‘Pepijn de Maat’, as visible from `\author{Pepijn de Maat}`.
2. If compiled on 01-09-2020, the title will say ‘September 1, 2020’.
3. Only the section ‘Introduction’ will make it into the table of contents, since paragraph titles are too low-level. If you want lower levels which do enter the table of contents, use subsections or subsubsections instead.
4. The % signifies a comment. In other words, any words typed after a % will not appear in the final PDF output. This is useful as remark for later considerations. In the screenshot it is also clear that TeXstudio automatically makes the combination %TODO green, which adds emphasis.

2 Exercise 2

The given PDF was compiled using the following code. Slight changes to the code will still give the same or a similar PDF output.

```
\documentclass{article}
\usepackage[margin=20mm]{geometry}

\author{J. J. J. \^Ur\‘ok}
\title{LaTeX sample file}
\date{September 2, 2020}

\begin{document}
\maketitle
\tableofcontents

\bigbreak
This is a work of fiction. Names, characters, places and incidents either are products
    of the author’s imagination or are used fictitiously. Any resemblance to actual
    events or locales or persons, living or dead, is entirely coincidental.

\section{Introduction}
This is just an arbitrary article to explore \LaTeX\ (this fancy LaTeX can be made
    using ‘\textbackslash LaTeX\textbackslash ’). By the way, the backslashes are made
    using \textbackslash textbackslash.
This is a new line within the same paragraph made with \textbackslash\textbackslash.
    Using this is considered bad practice.

This is a new paragraph. You can see the difference clearly; all the paragraphs except
    the first one have an indent. A paragraph can be created by using white-space (a
    ‘double enter’) in the .tex file, or by using the \textbackslash par command.
\bigbreak

Now I used a \textbackslash bigbreak, in order to create a whitespace. This can
    improve readability. The \textbackslash bigbreak command also creates a natural
    place for the compiler to end the page and continue on a new page.

\subsection{Historical remarks}
There are no historical remarks, for this is a very recently made article. Note how
    you need to compile twice before the table of contents has updated to include this
    new subsection.

\subsection{Previous Versions}
This is version 1.0.0. Version 0.9.0 didn’t use the Geometry package, which meant that
    the margins were huge compared to the current 2cm margins.

\subsection{Future Updates}
Things to add in future versions:
\begin{enumerate}
\item Use the Geometry package. [DONE]
\item Include an enumerate environment. [DONE]
\item Make the article ‘twocolumn’ using an optional argument [twocolumn] between
    \textbackslash documentclass and the ‘article’ between brackets. (Does this really
    make it look more professional?)
\item Add a picture. (Of what?)
\item Change the font to Comic Sans. (Might be too hard?)
\end{enumerate}

\end{document}
```

3 Exercise 3

The following formulas:

$$\int_{-\infty}^{\infty} e^{ax^2} = \sqrt{\frac{\pi}{a}}$$
$$R_{\mu\nu} - \frac{1}{2}Rg_{\mu\nu} + \Lambda g_{\mu\nu} = \kappa T_{\mu\nu}$$

comes from this code:

```
\begin{align*}
\int_{-\infty}^{\infty} e^{ax^2} &= \sqrt{\frac{\pi}{a}} \\
R_{\mu\nu} - \frac{1}{2}Rg_{\mu\nu} + \Lambda g_{\mu\nu} &= \kappa T_{\mu\nu}
\end{align*}
```

The same formula can also be achieved via alternate means, but this code is most likely the simplest.