

Getting Started with LaTeX

A Brief Tutorial on how to access, install and begin use of LaTeX

Section I: What is LaTeX?

Briefly put, LaTeX is a text editing and typesetting platform designed especially for the use in Mathematics, Engineering, Science and Industry. However, it should be noted that LaTeX is not only restricted to these fields.

What is the purpose of LaTeX?

LaTeX is a tool that can be used to produce professional quality documents that employ symbolic representation, charts and notation for quantitative and mathematical ideas and concepts. It can also be used to compose high quality presentations in power points, publish journal papers and books.

What are its benefits?

For the working mathematician, engineer or scientist, LaTeX has a library of commands which relay standard symbolic and notational conventions which allow for ease in representing and conveying mathematical constructs in a clear and easy manner.

Section II: How to Access and Acquire LaTeX.

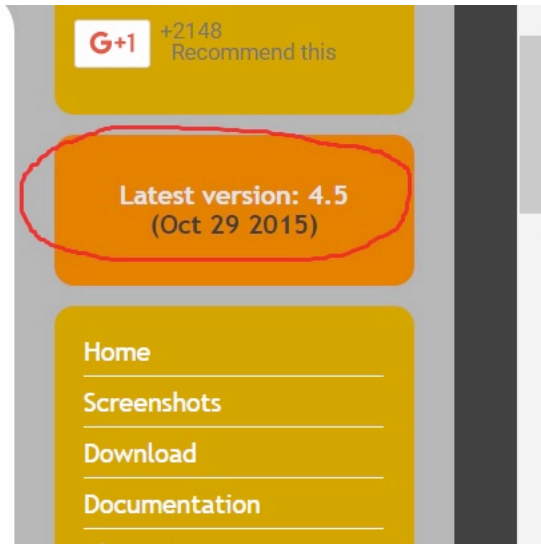
There are many popular LaTeX editors that are free and available as shareware. Some of the most popular are:

TeXMaker(Windows and Mac)

t integrates many tools needed to develop
ver with syntex support and continuous view



www.xm1math.net/texmaker/



For quick access, place your bookmarks here on the bookmarks bar. [Import bookmarks now...](#)

texmaker | The universal LaTeX editor

Free cross-platform LaTeX editor since 2003 (Windows, MacOSX, Linux)

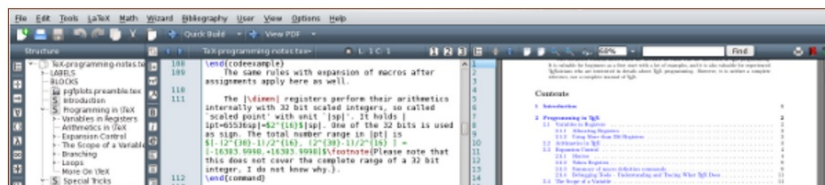
Summary

Texmaker is a free, modern and cross-platform LaTeX editor for linux, macosx and windows systems that integrates many tools needed to documents with LaTeX, in just one application.

Texmaker includes unicode support, spell checking, auto-completion, code folding and a built-in pdf viewer with syntex support and con mode.

Texmaker is easy to use and to configure.

Texmaker is released under the GPL license .



WinEDT(Windows)

<http://www.winedt.com/>

WinEdt 10

Created with WinEdt™

WinEdt is a powerful and versatile all-purpose text editor for Windows with a strong predisposition towards the creation and compilation of LaTeX documents...

WinEdt is used as a front-end (*integrated development environment*) for compilers and typesetting systems, such as TeX, HTML or NSIS. WinEdt's highlighting schemes can be customized for different modes and its spell checking functionality supports multilingual setups, with dictionaries (word lists) for many languages available on WinEdt's Community Site www.winedt.org. Contributions are welcome!



Although reasonably suitable as an all-purpose text editor, WinEdt has been specifically designed and configured to integrate seamlessly with a TeX System (such as [MiKTeX](#) or [TeX Live](#)). However, WinEdt's documentation does not cover TeX-related topics in depth; you'll find introductions and manuals on typesetting with TeX, as well as links to other recommended accessories, on TeX's Community Site ([TUG](#)). For LaTeX-related issues visit [LaTeX Community Forum](#): questions are welcome and help is forthcoming!



New: WinEdt 10.1

WinEdt 10.1 is now the *official* version of the program. It supports (customizable) *auto completion* and *code folding*, it is unicode/utf8-capable, and it integrates seamlessly with the latest accessories and TeX Systems (such as SumatraPDF viewer, MiKTeX 2.9 and TeX Live 2016). It has been extensively tested under Windows 10, 8 and 7 (32-bit and 64-bit).

TexWrangler (Mac)

<http://www.barebones.com/products/textwrangler/>

www.barebones.com/products/TextWrangler/

s, place your bookmarks here on the bookmarks bar. [Import bookmarks now...](#)

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[BBEdit](#) [Yojimbo](#) [Yojimbo for iPad](#) [TextWrangler](#)

TextWrangler

TextWrangler is an all-purpose text and code editor for Mac OS X, based on the same award-winning technology as [BBEdit](#), our leading professional HTML and text editor.

We're encouraging everyone currently using or interested in using TextWrangler to install and use [BBEdit](#).

We've put together a [handy chart](#) comparing BBEdit and TextWrangler, to help you out. And of course, we have a fully functional [demonstration version](#) so that you can try out BBEdit.

[Should I upgrade to BBEdit?](#)

Each of these provides an editing environment to use LaTeX code and compose documents. It can also make documents in many different formats, from pdf to power point.

To produce documents, you'll need to also download MikTeX. It's a companion software which allows the tex-editors to compile and create the documents. This can be found here.

<http://miktex.org/>

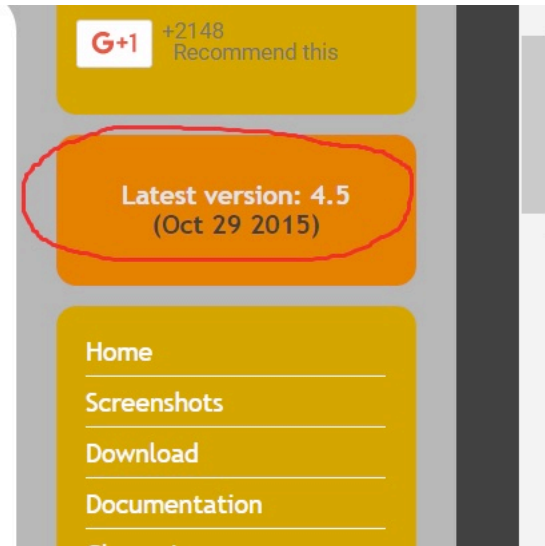
The screenshot shows the MikTeX website homepage. At the top, the browser address bar displays "miktex.org". Below the address bar, a navigation menu includes links for Home, About, Download, Portable, Help, Contact, and Give Back. The main content area features a "Welcome" message: "Welcome to the MiKTeX project page!". Below this, there are links for "New here? Learn more about MiKTeX..." and "Want to install MiKTeX? Start with a tutorial:". Two "Howto" links are provided: "Howto: Install MiKTeX on your Windows computer" and "Howto: Rollout MiKTeX in your organization". On the left side, there is a sidebar with the Qlik logo and the text "Visualize your data. Find insights that matter. Qlik Sense Desktop".

For this tutorial, we will focus on use and installation of Texmaker in conjunction with MikTeX.

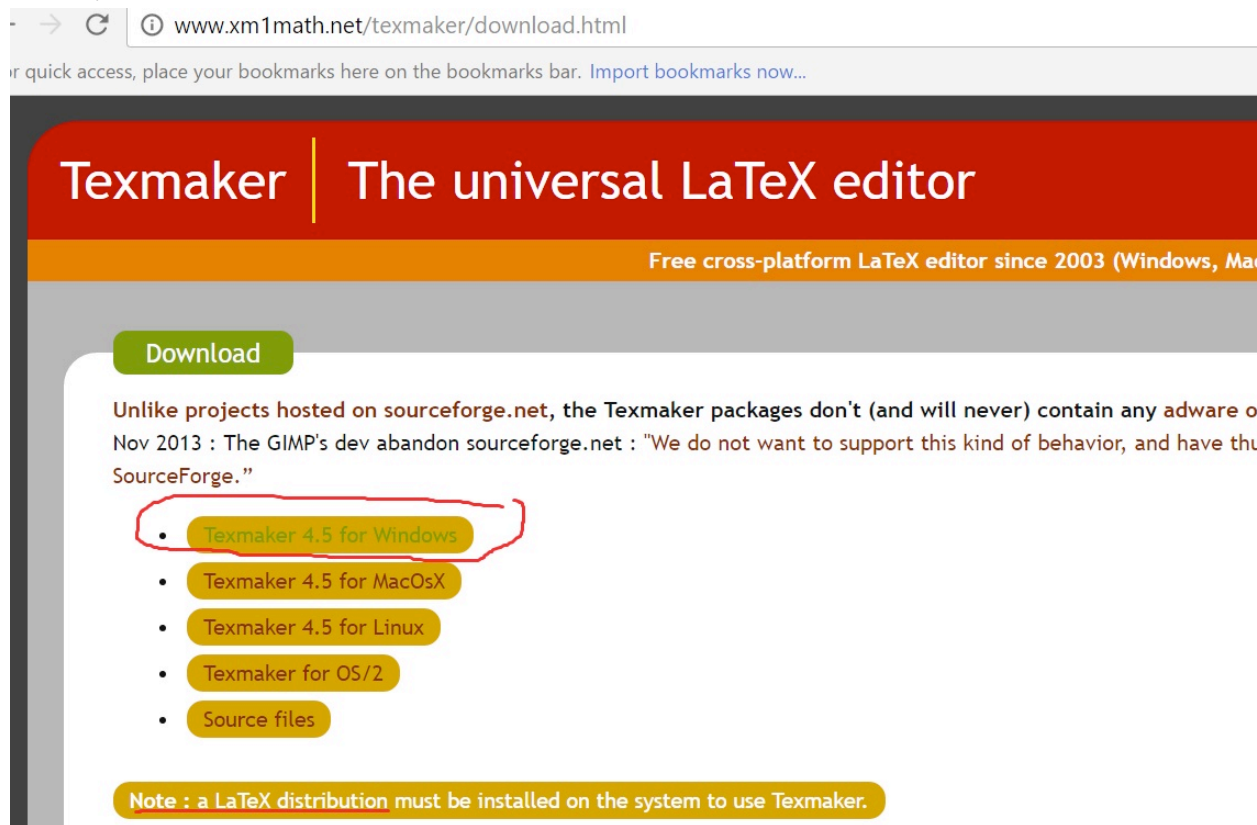
Installing TexMaker

1) In the TexMaker weblink, from the previous section, search for the tab/link labeled “latest version” on the side panel of the page as shown below and click on the link

t integrates many tools needed to develop
ver with syntex support and continuous view

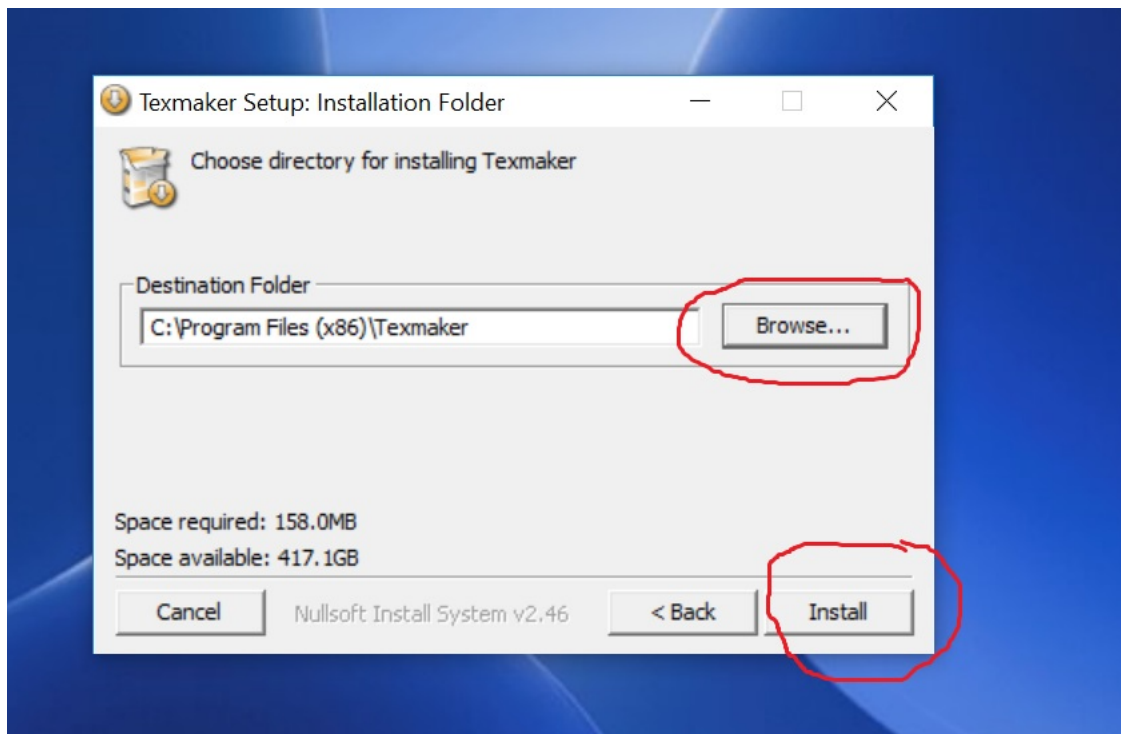
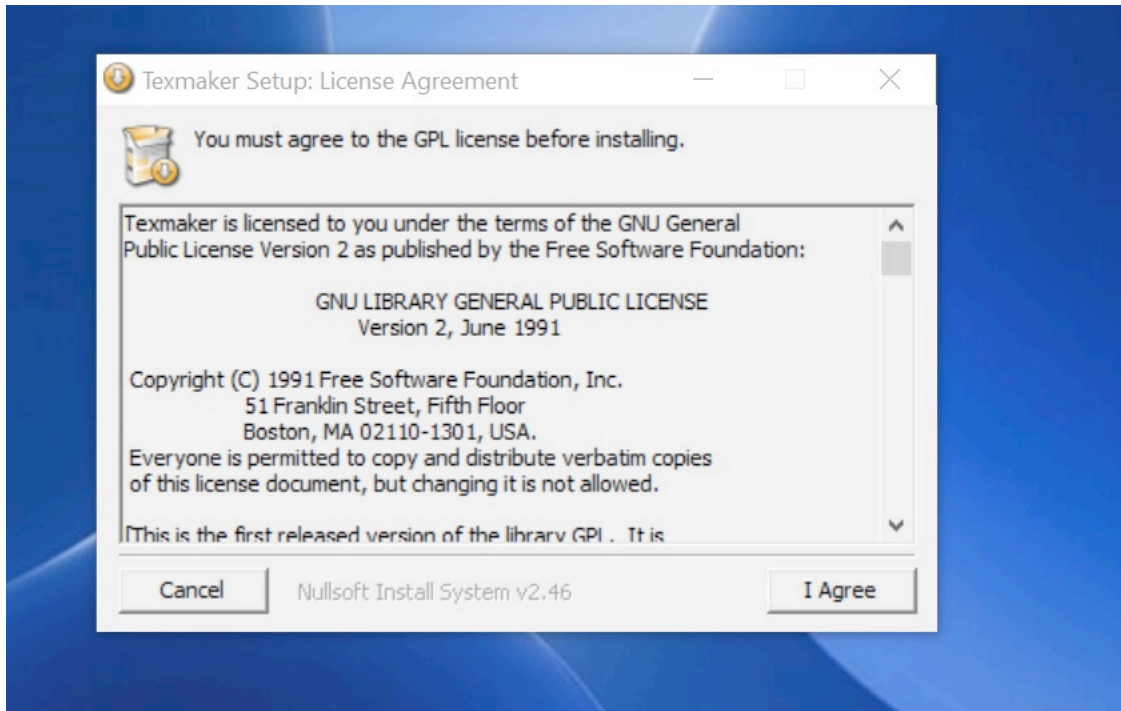


2) Upon clicking it should immediately take you to this page. For Windows users, click the circled link.

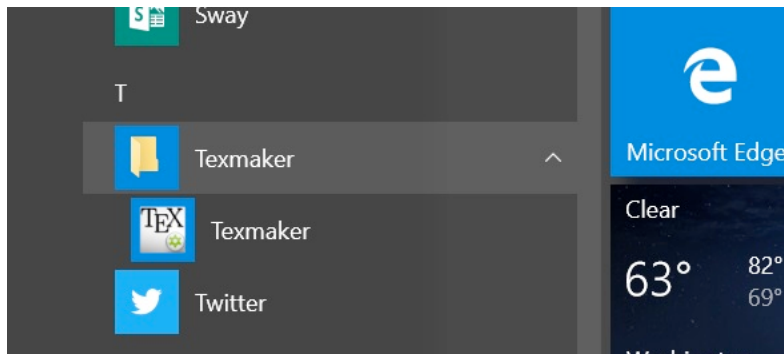


3) Upon clicking the link, you'll be taken to the download and installation page. Select *texmakerwin32_install.exe* and begin installing your program

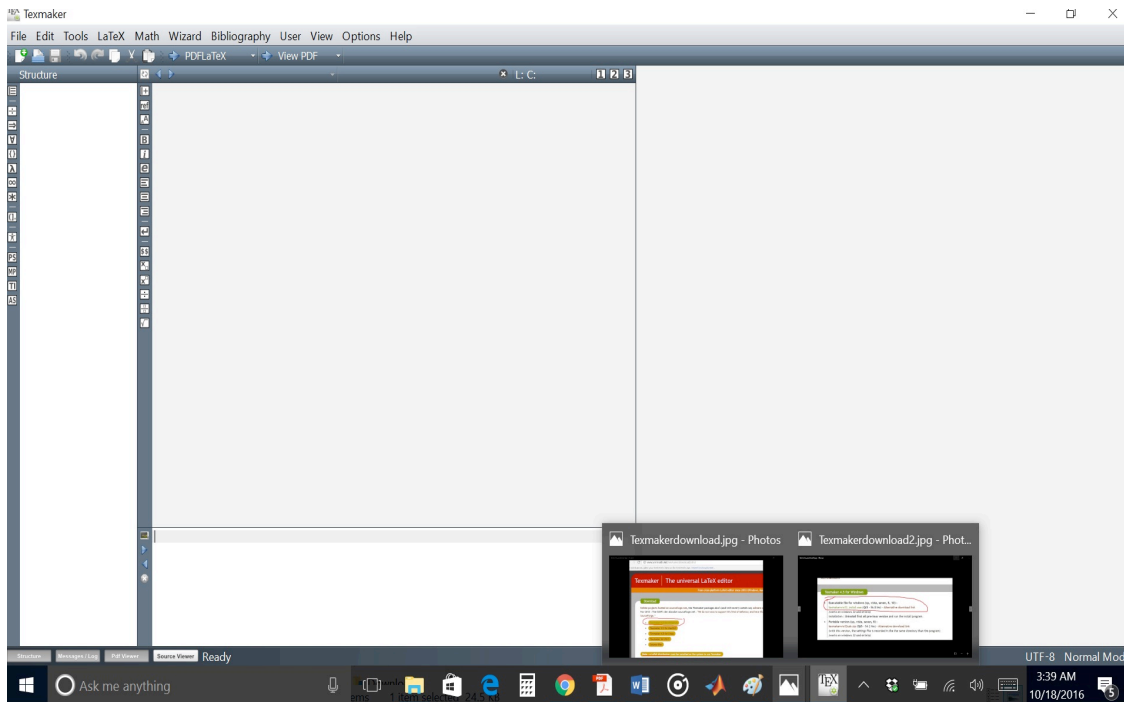
4.) Once downloaded, locate the .exe file and begin the installation process. Follow the prompt to install Texmaker to a directory, typically in 'Program Files'. Make sure your system has enough memory to load 158 MB for the installation.



5) Once completed, you can find Texmaker on your Windows Start Menu. Then clicking on the icon will start the program.



Once started the editor screen will look like this.



For TexMaker to operate, we now need to install MikTeX

Welcome

Welcome to the MiKTeX project page!

New here? [Learn more](#) about MiKTeX...

Want to install MiKTeX? Start with a tutorial:

[Howto: Install MiKTeX on your Windows computer](#)

[Howto: Rollout MiKTeX in your organization](#)

Want to support the project? Please [give back!](#)

The MiKTeX page has its own installation tutorial or you can follow the guide given here.

Download MiKTeX

Download and run the Basic MiKTeX installer to setup a basic TeX/LaTeX system on your computer. Please read the [tutorial](#) guidance.

If you want to install MiKTeX on many client computers, then you should use the MiKTeX Setup Utility to deploy MiKTeX in ; read the [deployment tutorial](#), if you want step-by-step guidance.

When you have installed MiKTeX, it is recommended that you [run the update wizard](#) in order to get the latest updates.

 [Basic MiKTeX Installer, 64-bit](#)

 [Basic MiKTeX Installer, 32-bit](#)

 [MiKTeX Net Installer, 64-bit](#)

 [MiKTeX Net Installer, 32-bit](#)

 [MiKTeX Setup Utility, 64-bit](#)

Once you click on the download link from the first page, MikTek has several download options depending on the system. Pick the option which best suits your system requirements. Note there are two programs listed, MikTek Installer and MikTek Set Up Utility. Get MikTek Installer as this will be sufficient for use of Texmaker.


 [Basic MiKTeX Installer, 32-bit](#)

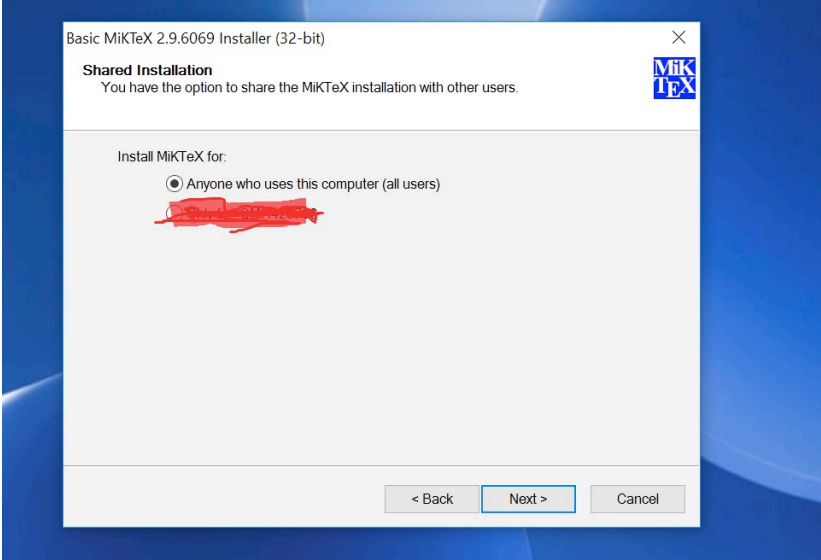
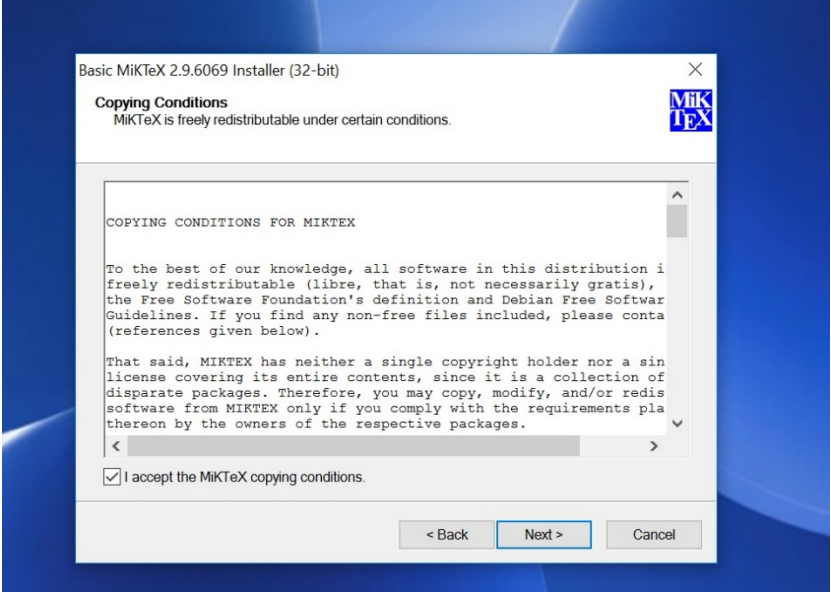
To install a basic TeX/LaTeX system, download and run this installer. MiKTeX has the ability to install needed packages automatically (on-the-fly), i.e., this installer is suitable for computers connected to the Internet.

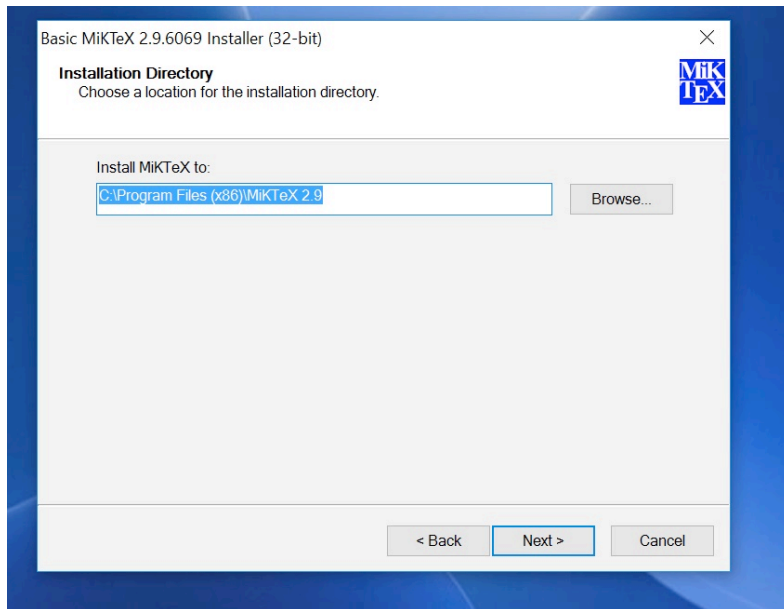
Date: 8/16/2016

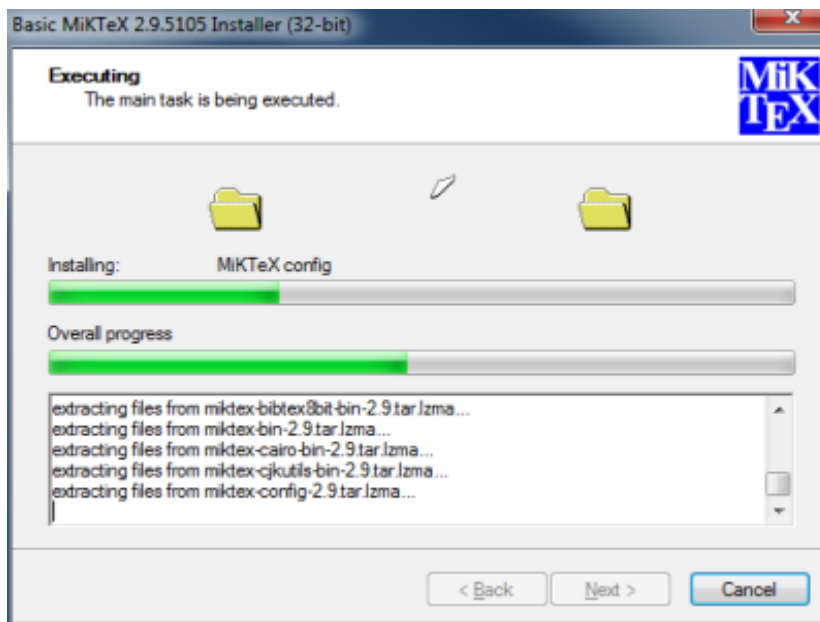
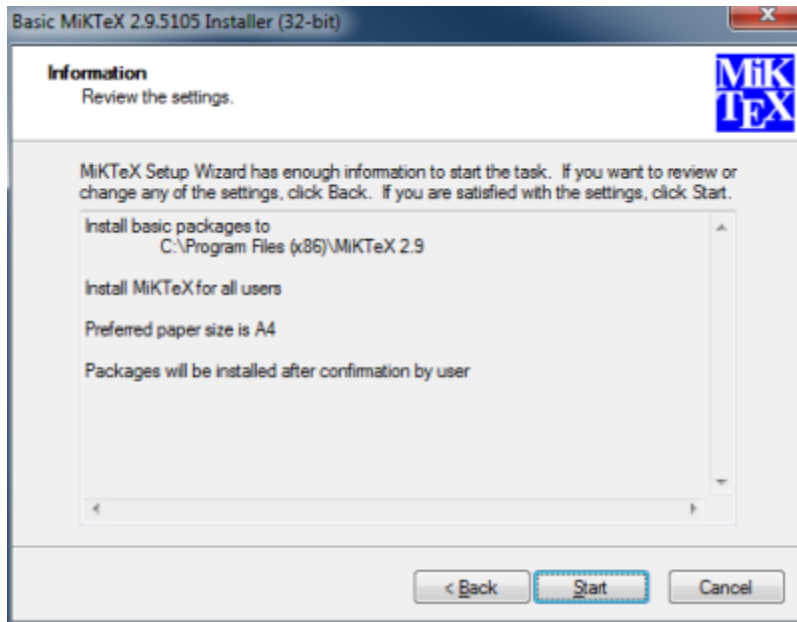
File name: basic-miktex-2.9.6069.exe

Size: 183.06 MB

 [Download](#)

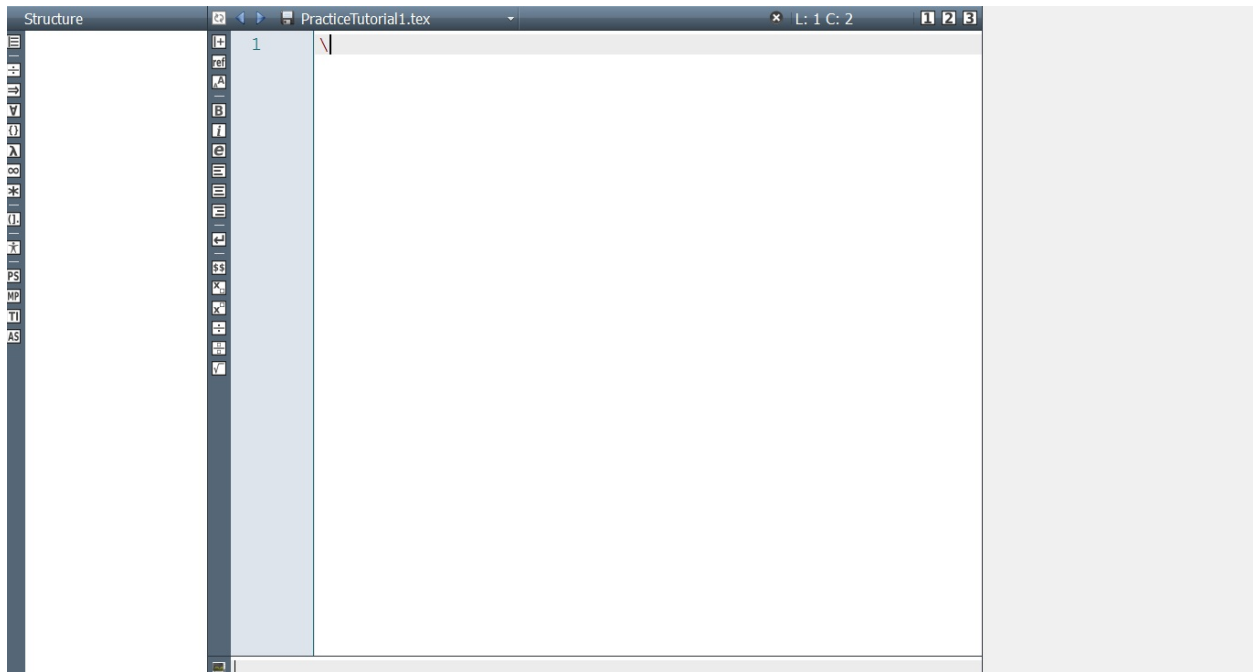






Once MikTeX is installed, it does not need to be initiated for use of TexMaker.

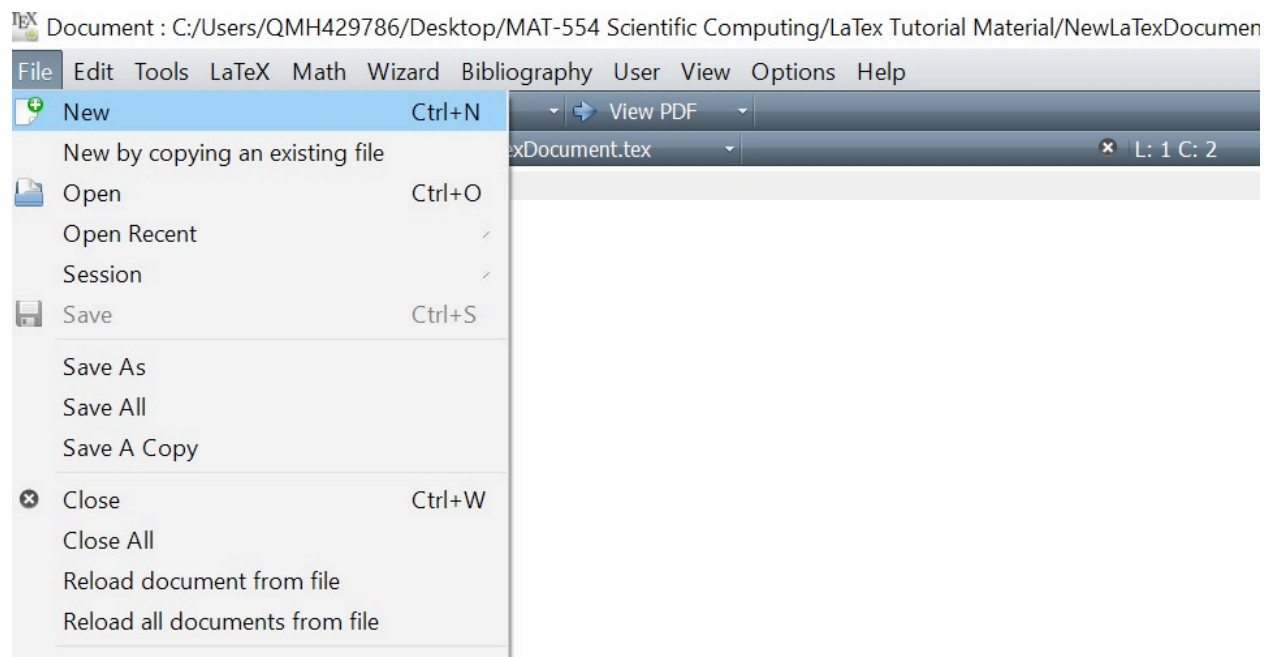
3. Using the TexMaker GUI (Graphical User Interface)



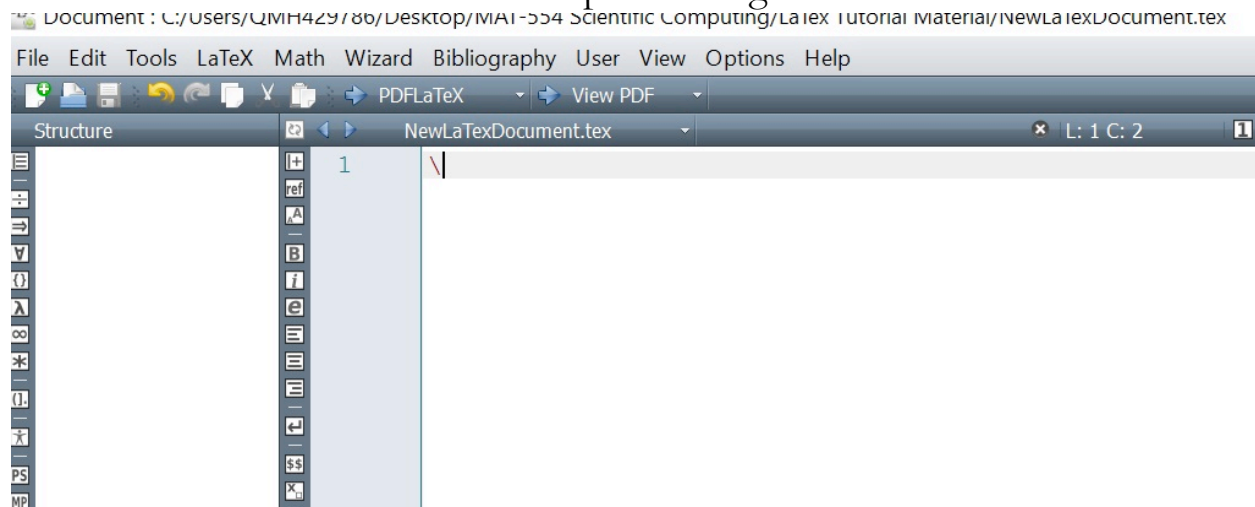
4. Configuring TexMaker for Beginning Users

5.) Basic LaTeX Commands

To begin a LaTeX document open TexMaker and start a new file



Once initiated, to begin input we must apply a backslash “\” to indicate to TexMaker that we want to start implementing commands



Once we have done this , we can implement commands using LaTeX Code

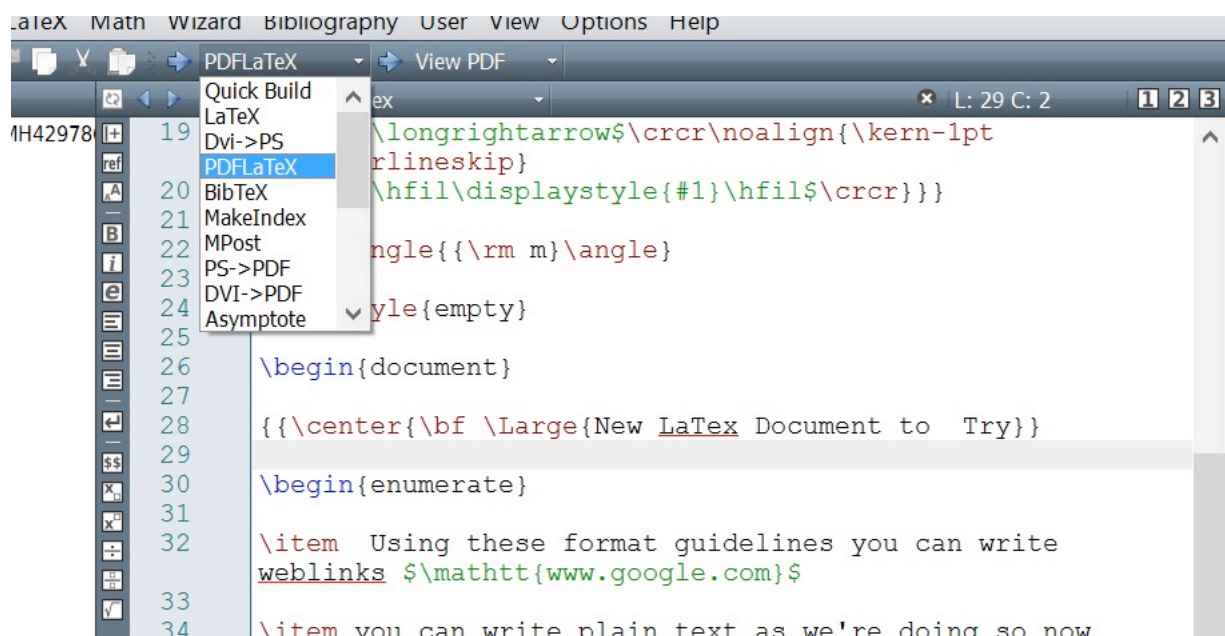
```
8 \usepackage{amsmath}
9 \usepackage{amsthm}
10 \usepackage{amssymb}
11 \usepackage{latexsym}
12 \usepackage{graphicx}
13
14 \def\linne#1{\vbox{\ialign{##\crcr
15     $\longleftarrow$\crcr\noalign{\kern-1pt
16     \nointerlineskip}
17     $\hfil\displaystyle{#1}\hfil$\crcr}}
18
19 \def\ray#1{\vbox{\ialign{##\crcr
20     $\longrightarrow$\crcr\noalign{\kern-1pt
21     \nointerlineskip}
22     $\hfil\displaystyle{#1}\hfil$\crcr}}
23
24 \def\mangle{{\rm m}\angle}
25
26 \pagestyle{empty}
27
28 \begin{document}
29
30 {\center{\bf \Large{New LaTeX Document to Try}}}
31
32 \begin{enumerate}
33
34 \item Using these format guidelines you can write
35 \uweblinks $\mathtt{www.google.com}$
```

```

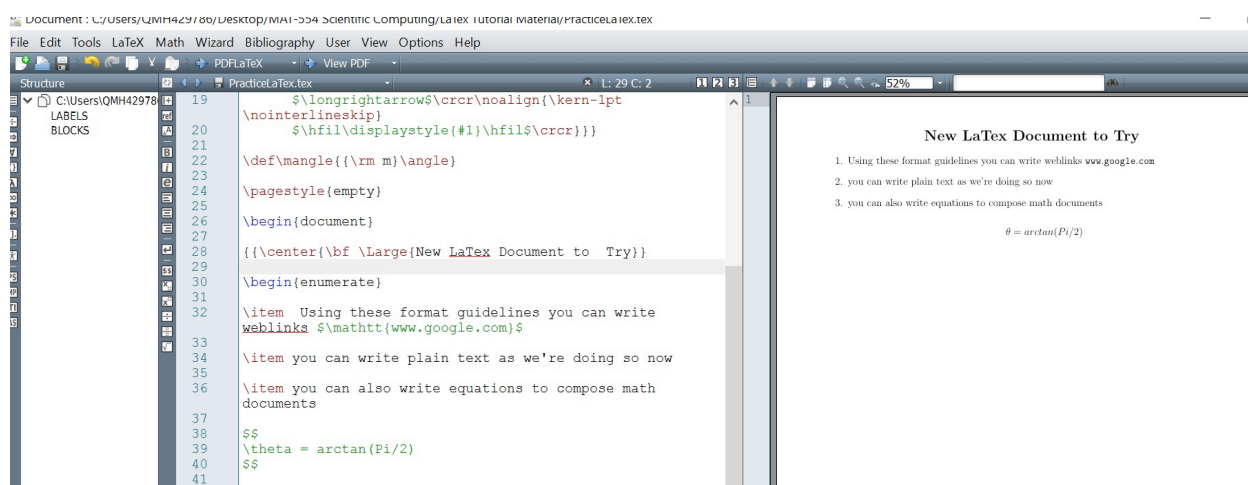
8 \usepackage{amsmath}
9 \usepackage{amsthm}
10 \usepackage{amssymb}
11 \usepackage{latexsym}
12 \usepackage{graphicx}
13
14 \def\linne#1{\vbox{\ialign{##\crcr
15     $\longleftarrow$\crcr\noalign{\kern-1pt
\nointerlineskip}
16     $\hfil\displaystyle{#1}\hfil$\crcr}}}
17
18 \def\ray#1{\vbox{\ialign{##\crcr
19     $\longrightarrow$\crcr\noalign{\kern-1pt
\nointerlineskip}
20     $\hfil\displaystyle{#1}\hfil$\crcr}}}
21
22 \def\mangle{{\rm m}\angle}
23
24 \pagestyle{empty}
25
26 \begin{document}
27
28 {\center{\bf \Large New LaTeX Document to Try}}
29
30 \begin{enumerate}
31
32 \item Using these format guidelines you can write
weblinks $\mathtt{www.google.com}$
33
34 \item you can write plain text as we're doing so now
35

```

Once you have your code set, then make sure the editor is set to either PDFLaTeX, LaTeX or Quick Build. Then hit the right arrow “View PDF”



This is what your PDF should look like once compiled.



Summary of Basic Mathematical Commands Using LaTeX

Although we have introduced the notion that LaTeX can be used for numerous applications within and outside of mathematics, our main focus here is to emphasize its power in producing mathematical documents. To

begin we should become familiar with basic LaTeX commands. There are several tutorials and documents available that list a library of commands that can be used for reference. Here we will implement the most fundamental commands.

Formulating an equation

Here we will write an equation in LaTeX on the left and show its output on the right

```
\begin{equation} x^2=y*\sin x-4\label{eq:xdef}
\end{equation}

$$
```

Practice LaTeX Commands

$$x^2 = y * \sin x - 4 \quad (1)$$

Here we see that after the backslash we can label and number equations as we have demonstrated in the output.

Equations can also be written as arrays. Here we show the implementation of both the use of numbering and listing equations in an array

```
\begin{equation}
\begin{array}{l}
\displaystyle \int 1 = x + C \\
\displaystyle \int x = \frac{x^2}{2} + C \\
\displaystyle \int x^2 = \frac{x^3}{3} + C
\end{array}
\label{eq:xdef}
\end{equation}
```

Practice LaTeX Commands

$$\begin{array}{l} \int 1 = x + C \\ \int x = \frac{x^2}{2} + C \\ \int x^2 = \frac{x^3}{3} + C \end{array} \quad (1)$$

The placing of the number label can also be shifted down as so:

```
\begin{document}
\begin{eqnarray}
& \int 1 = x + C \nonumber \\
& \int x = \frac{x^2}{2} + C \nonumber \\
& \int x^2 = \frac{x^3}{3} + C \label{eq:xdef}
\end{eqnarray}

\end{document} [document]
```

Practice LaTeX Commands

$$\begin{array}{l} \int 1 = x + C \\ \int x = \frac{x^2}{2} + C \\ \int x^2 = \frac{x^3}{3} + C \end{array} \quad (1)$$

Here we demonstrate the use of braces

```
\begin{document}

$$\begin{matrix} \right[ 0,1 \\ \left] \\ + \lceil x \rfloor - \langle x,y \rangle \end{matrix}$$

\end{document} [document]
```

Practice LaTeX Commands
 $0,1] + [x] - (x,y)$

Building Reference Pages and Citations Using LaTeX

Often times LaTeX is not only used to simply produce documents, but more importantly develop and typeset scholarly papers. This incorporates citations, footnotes and a bibliography within the body or at the end of a page or a text.

Bibliography:

To initialize a bibliography, we'll need to call first call `\documentclass` and the proper document packages applying the `\usepackage` command and then finally `\addresource{}` to prepare our bibliography document before beginning.

```
\begin{document}
Here we will cite a a journal paper by Einstein's journal
\cite{einstein} and then a physics \cite{dirac}
book by Dirac \cite{dirac}
```

```
\bibliographystyle{siam}
\bibliography{sample}
```

```
\end{document}
```



Here we will cite a a journal paper by Einstein's journal [2] and then a physics [1] book by Dirac [1]

References

- [1] P. A. M. DIRAC, *The Principles of Quantum Mechanics*, International series of monographs on physics, Clarendon Press, 1981.
- [2] A. EINSTEIN, *Zur Elektrodynamik bewegter Körper. (German) [On the electrodynamics of moving bodies]*, Annalen der Physik, 322 (1905), pp. 891–921.

LaTeX can also create tables; there are several formats which can be used as per the user's preference.

Example 1

```
.begin{center}
\begin{tabular}{|l|c|c|c|l|}
\hline
Col1 & Col2 & Col2 & Col3 & \\ \hline\hline
1 & 6 & 87837 & 787 & \\ \hline
2 & 7 & 78 & 5415 & \\ \hline
3 & 545 & 778 & 7507 & \\ \hline
4 & 545 & 18744 & 7560 & \\ \hline
5 & 88 & 788 & 6344 & \\ \hline
\end{tabular}
\end{center}
```

Col1	Col2	Col2	Col3
1	6	87837	787
2	7	78	5415
3	545	778	7507
4	545	18744	7560
5	88	788	6344

Here we demonstrate images in LaTeX. It is important to note that it is optimal to save images in png format. Images should also be saved in the same folder as the TeX file for the compiler to call it in the compilation of the LaTeX document.


PDFLaTeX VIEW PDF
LaTeXImage.tex L: 17 C: 1 54%

```
1 \documentclass{article}
2 \usepackage{amsmath}
3 \usepackage{amssymb}
4 \usepackage{graphicx}
5
6 \begin{document}
7 \title{ImageinLaTeX}
8
9 \author{WCUPAMathDept}
10
11 We can see here how LaTeX produces images within documents
12
13 \includegraphics{cosmos.png}
14
15
16 \end{document}
17
```

1

We can see here how LaTeX produces images within documents

The universe is immense and it seems to be homogeneous, in a large scale, everywhere we look at.



There's a picture of a galaxy above