LaTeX: Online module 1

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Topics to be covered

- Introduction
- Advantages over Microsoft Word
- Various editors
- Header of LaTeX document
- Examples
- Summary

Introduction

- TEX was written by Donald Knuth which is a high quality type setting program
- Some macros written by Leslie Lamport for using them in TEX were termed as LATEX
- All the commands in TEX and LATEX start with a backslash (\)
- LATEX looks more difficult to use than any word processor but displays much better appearance than them
- Both TEX and LATEX are high quality document preparation system

LaTeX (vs) Microsoft Word

- Subtle details of formatting are taken care by LaTeX
- Typesetting mathematical equations is far better in LaTeX
- Compatibility of LaTeX files are taken care off, but there might be either forward (or, backward) compatibility issue with different versions of word
- LaTeX is stable in handling large sized documents when compared to word
- Various packages are available with user defined macros
- Portable document format (PDF) documents are generated directly which can be distributed immediately across an organization

Disadvantages

- More commands to learn in the beginning
- At times, debugging of code could be more time consuming
- Sometimes it is hard to control placement of images on a page
- Less intuitive than using any word processors

Basic idea

Steps involved are the following:

1. Create a source file that has formatting commands using an editor and save the file with *.tex* extension, say, *sample.tex*
2. Compile the latex file *sample.tex*. If you find any error messages then type *X* to quit the program. Re-edit the file and compile again
3. You can preview the file on your screen in *.dvi* or *.pdf* format.
4. You can print it by converting into a *.pdf* file.

Various editors

- Windows platform
  1. Winedt (easy to use for beginners)
  2. Texworks
- Mac platform
  1. TexShop
  2. Texworks
- Unix platform
  1. Emacs
  2. Vi

Example

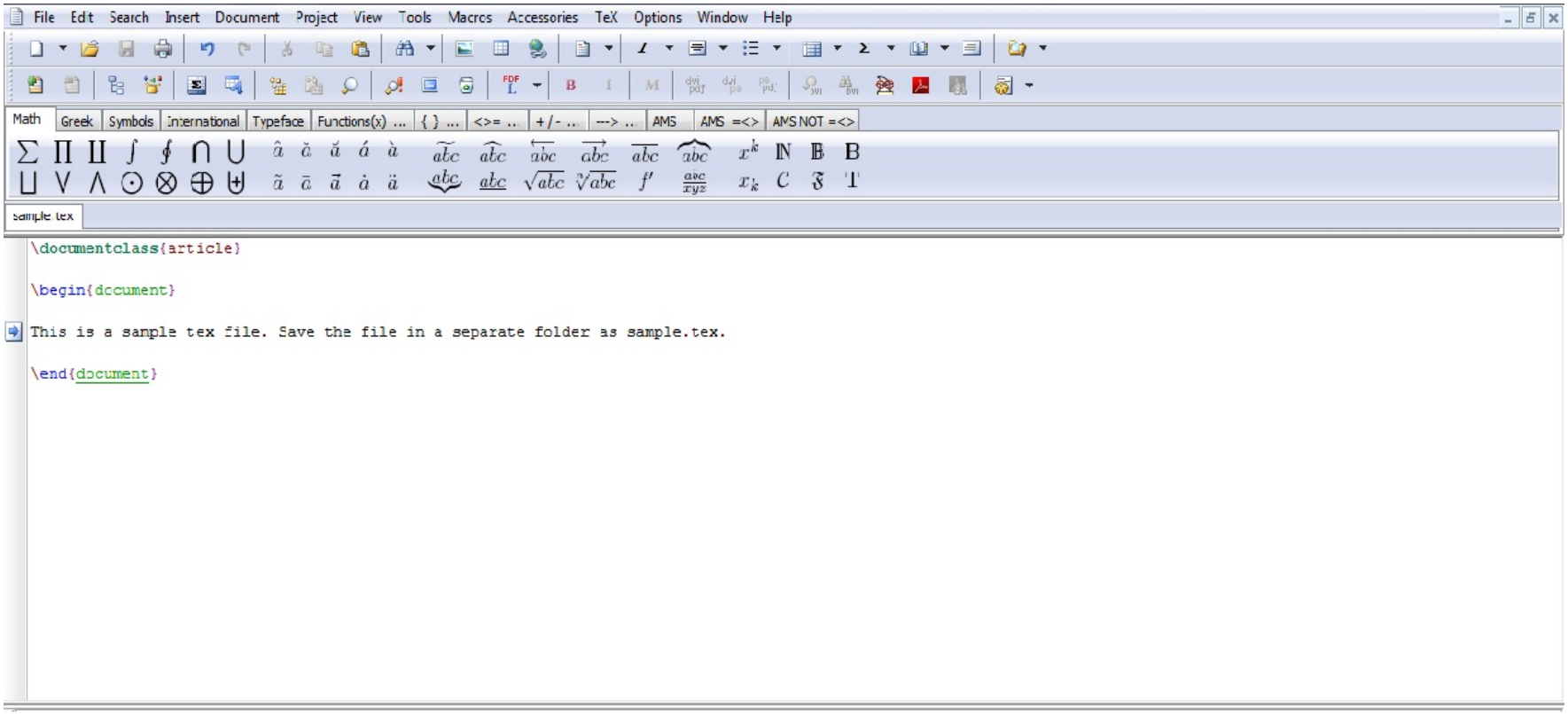

Fig1: Snap shot of a sample tex file created from Winedt editor on windows platform

contd...

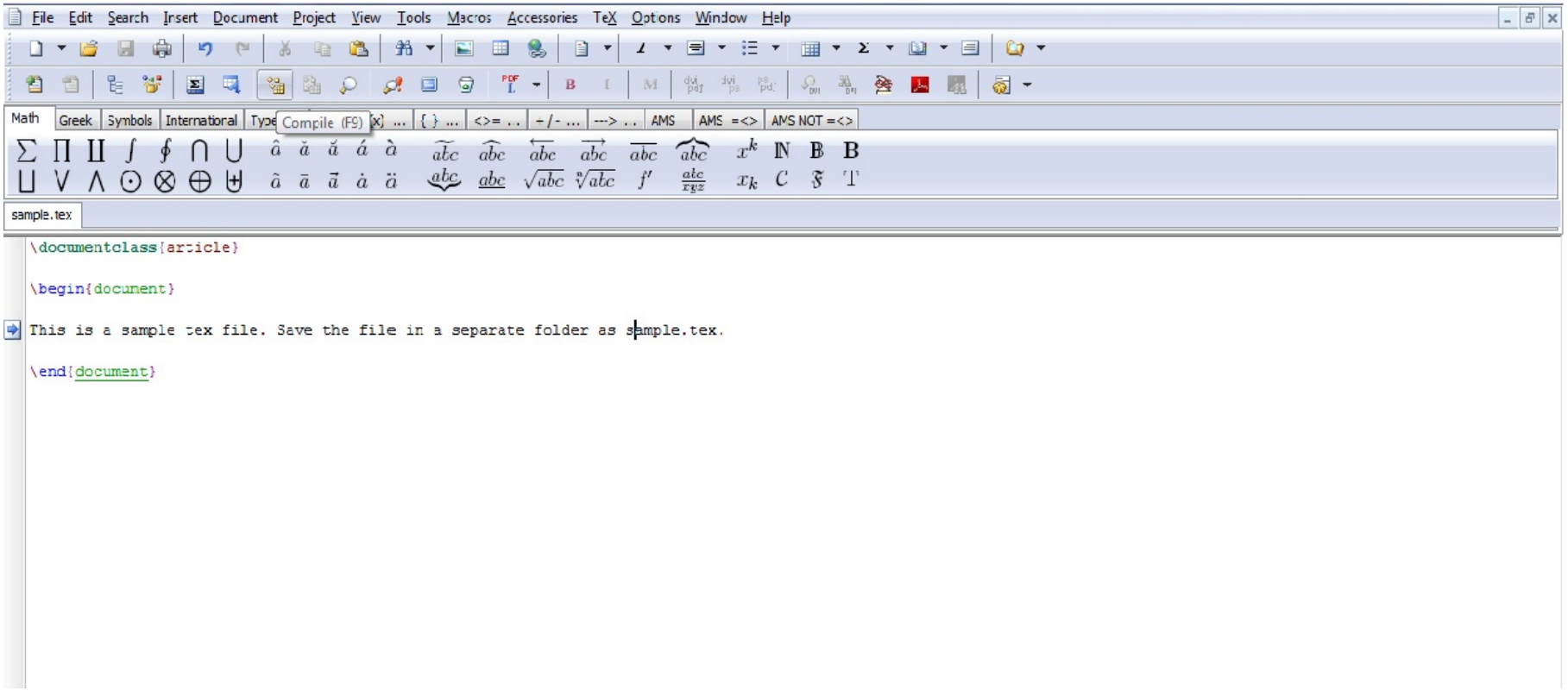

Fig2: Compile option highlighted in the above snap shot or press F9 for compiling the file

contd...

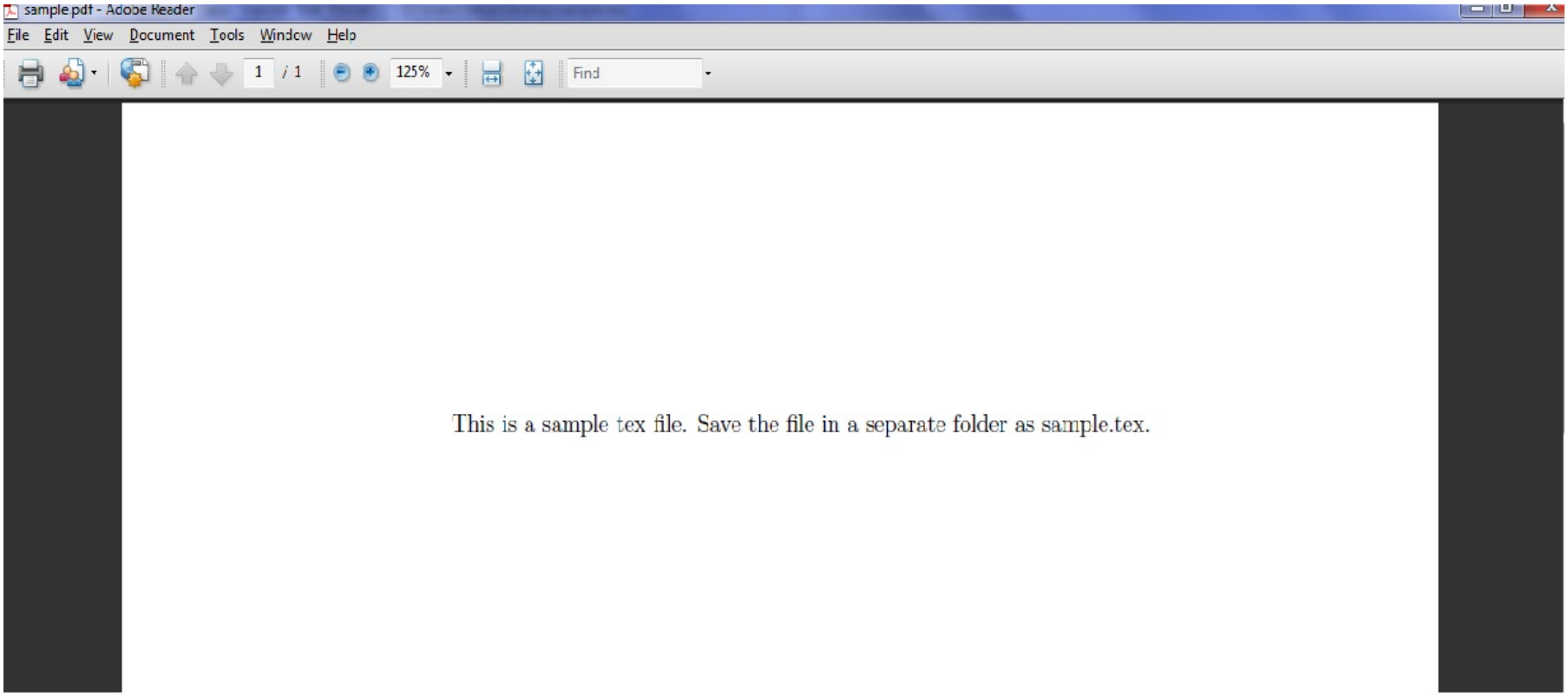

Fig3: Output of the sample tex file

Header of latex file

- All formatting commands start with back slash (look at the previous example).
- Command *documentclass* conveys to the program the kind of file to be compiled
  1. Article: journal papers (single or two column formats), reviews, tutorials
  2. Report: Thesis writing
  3. Slides: Used for slide preparation (for example, this file is prepared using Beamer class)
  4. Book: Used to write books.

contd...

Options can be specified for the document classes- article and report

- Points
  1. $11pt$: Specifies 11 point type size
  2. $12pt$: Specifies 12 point type size
- Column
  1. *Twocolumn*: Gives two column output
- $a4paper$: Produces $A-4$ page layout

Example: $\backslash documentclass[11pt, a4paper, twocolumn]\{report\}$
Output: Generates a report with 11 point type size and an $A-4$ page layout.

Example

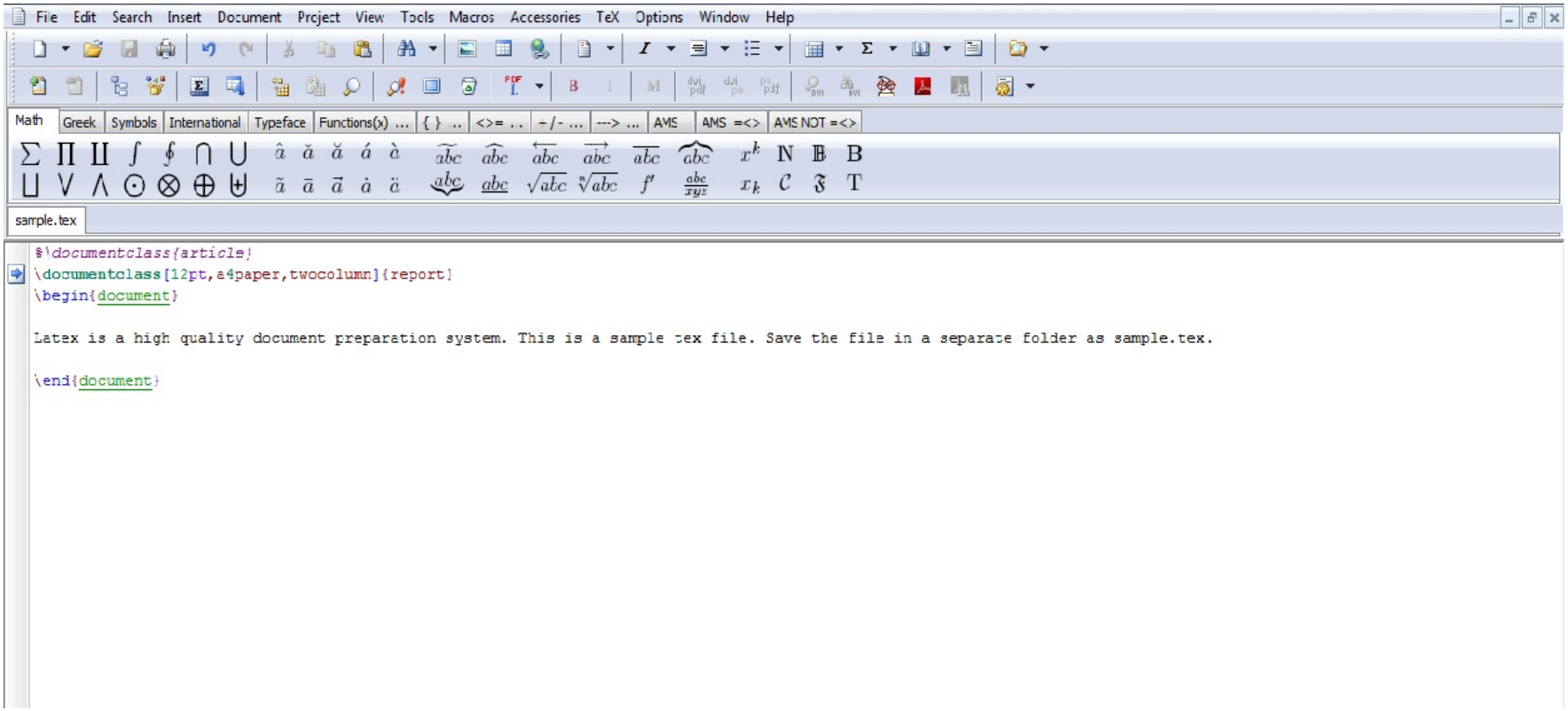

Fig4: Example of a LaTeX file using different options in the header

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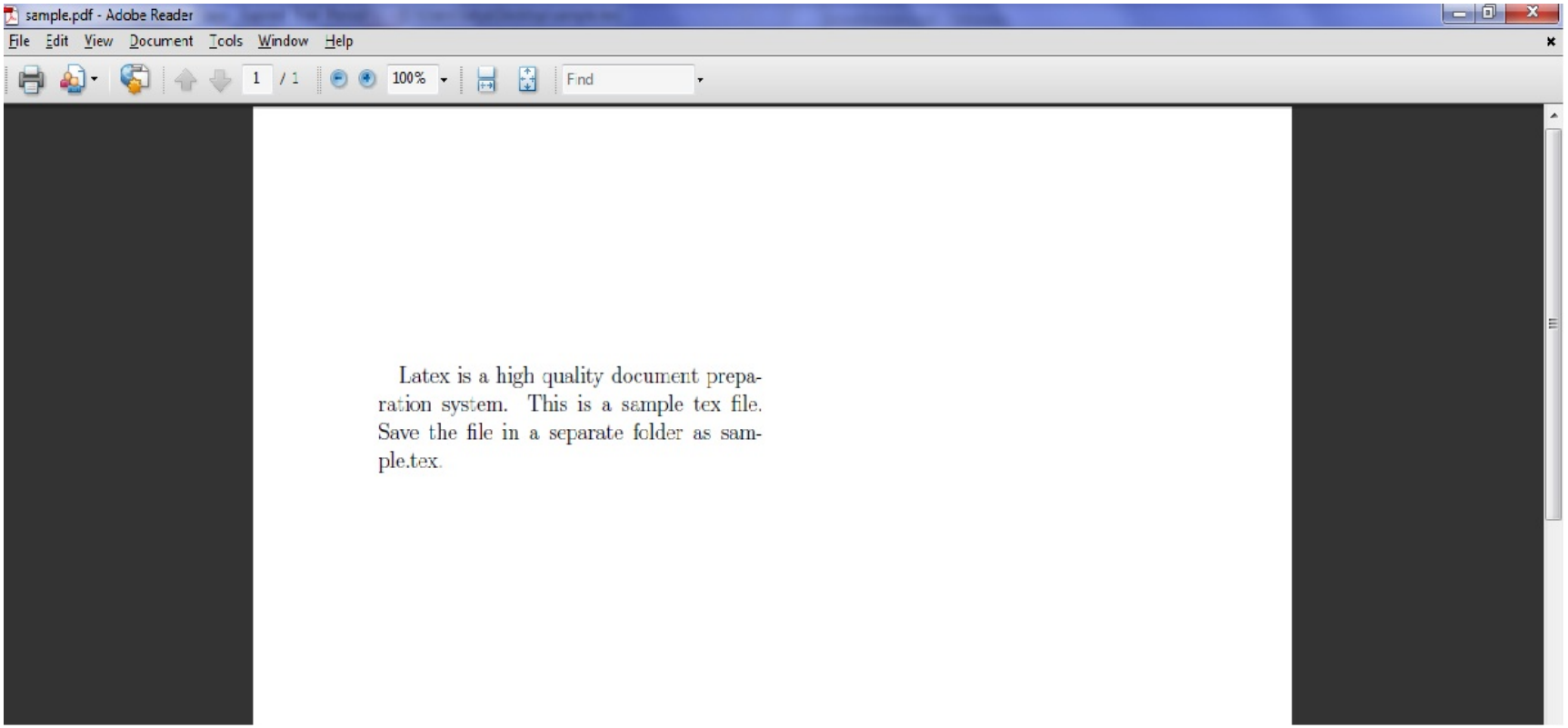

Fig5: Output of example from previous slide (11 point type size with two column format)

Packages

- Additional features to use in LaTeX are provided by *Packages*
- Package: Collection of files that has a bunch of commands used for LaTeX programming
- To include a package use the command: $\backslash usepackage\{packagename\}$ in the header
- There are several packages that get installed during the set-up of LaTeX

contd...

- If a package is missing, LaTeX will give a warning message saying that the package is missing and can be downloaded from `http://www.ctan.org`
- System gets connected automatically to the server and the package gets installed in your system (make sure your system is connected to the web)

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Most commonly used packages are the following:

- amssym: Adds symbols to be used in the math mode
- amsmath: Adds useful math environments to be used in programming
- graphicx: Include pictures (supports formats like .jpg, .png, .eps, .pdf, etc)
- wrapfig: Figures with text wrapping can be included in your document

Example

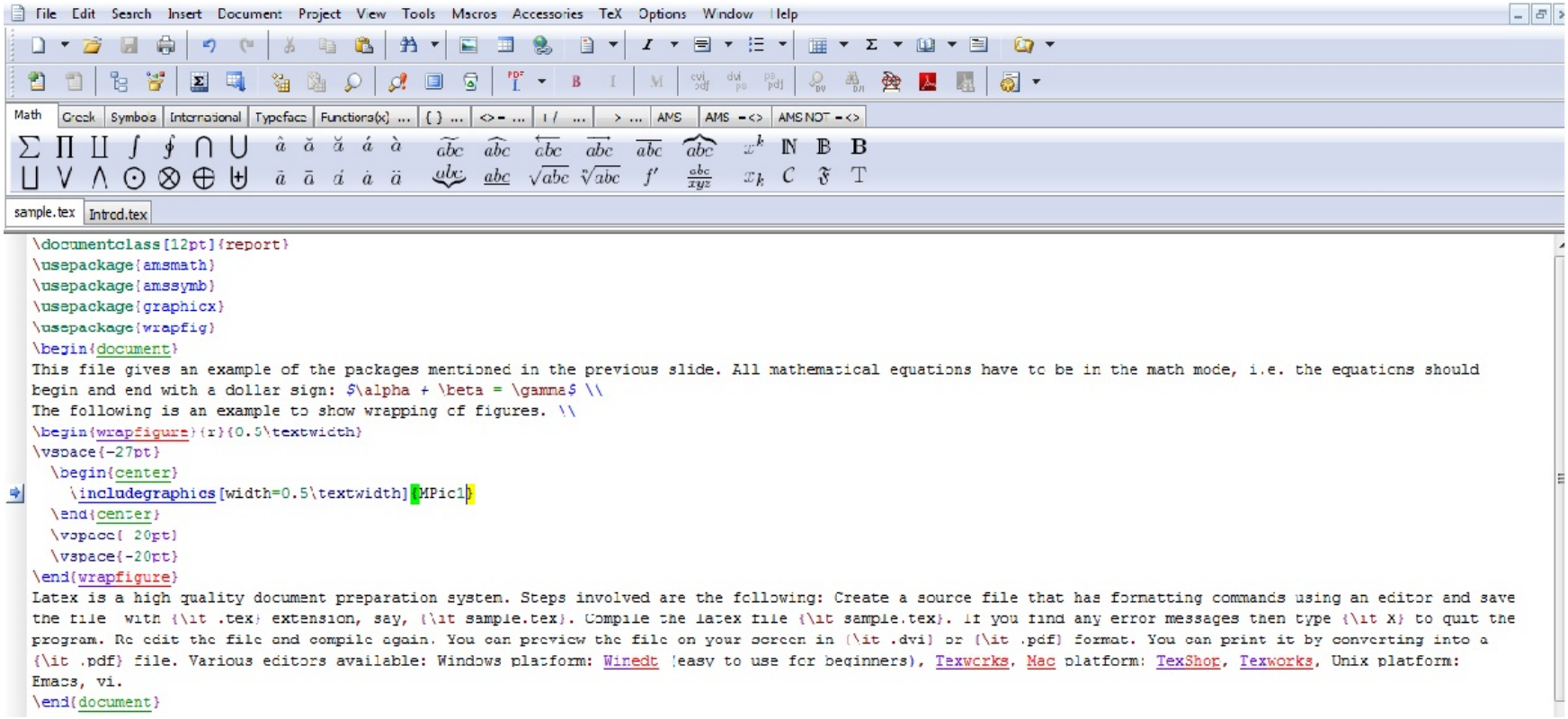

Fig6: Example that shows about including packages

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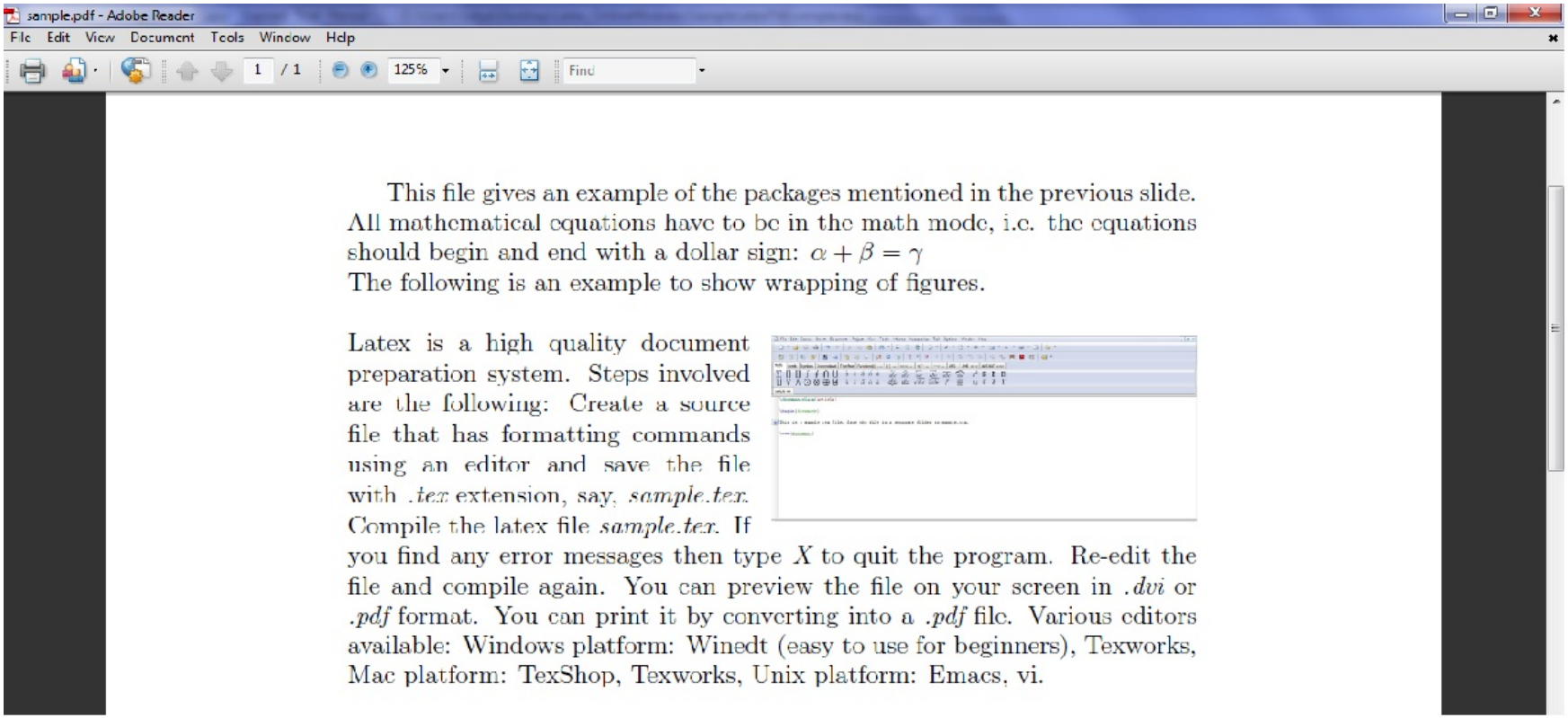

Fig7: Output of the previous example

Page set-up

- LaTeX sets the default values for dimensions of the page like margins length, space between two paragraphs, indentation length, etc.
- Painful process to set up manually (which might be required for special reports or articles), examples for such commands are:
  1. *parskip*- distance between any two paragraphs
  2. *parindent*- length of indentation before a paragraph
  3. *addtolength*- text size can be defined
- The body of the article should be within *begin*{*document*} and *end*{*document*}
- Any text written after *end*{*document*} will be neglected

Take away points

- LaTeX over Word
- Different editors available
- Format of a LaTeX file
- Understanding the header or preamble
- Packages to be used in the programming
- User defined page set up

References

For more references please visit the following websites:

1. http://www.latex-project.org/
2. http://en.wikibooks.org/wiki/LaTeX
3. http://www.ctan.org/