

# Tips on Beamer, TikZ and BibTeX

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- 1 Introduction to Beamer
  - The preamble
  - Frames
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- 2 Tikz/PGF
  - A simple template
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  - “foreach” allows for some inline coding
- 3 BibTeX
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# Start to use L<sup>A</sup>T<sub>E</sub>X

The American Mathematical Society ( $\mathcal{AMS}$ ) and many other organizations worldwide accept manuscripts in L<sup>A</sup>T<sub>E</sub>X.

The best way to learn it is to start to use it. Examples:

- homework
- papers
- official documents

```
\begin{itemize}  
\item homework  
\item papers  
\item official documents  
\end{itemize}
```

# L<sup>A</sup>T<sub>E</sub>X: made to type-set math

You can write math in-line. For all  $x_i \in \mathcal{A}$ , there exists some  $c \in \mathbb{Z}$  such that  $x_i^2 \equiv f(x_i + c)^2 \pmod{p}$ , with  $p$  prime.

For all  $\$x_i\in\mathrm{\mathcal{A}}\$, there exists some  $\$c\in\mathrm{\mathbb{Z}}\$ such that  $\$x_i^2\equiv f(x_i+c)^2 \pmod{p}\$, with  $\$p\$ prime.$$$$

You can also separate equations, as in the following:

$$a^2+b^2 = \begin{cases} c^2 & \text{when } c \text{ is the hyp. of a right triangle,} \\ \sum_{i=1}^n \Delta(\varepsilon_i^{\sin(\alpha)}) & \text{when this makes no sense.} \end{cases} \quad (1)$$

```
\begin{equation}
a^2+b^2=
\begin{cases}
c^2 & \& \text{when } \$c\$ is the hyp. of a right triangle,}\\
\sum_{i=1}^n \Delta(\varepsilon_i^{\sin(\alpha)}) & \& \text{when this makes no} \\
& \text{sense}.
\end{cases}
\end{equation}
```

# The preamble

- A LaTeX file always starts with `\documentclass{}`, follows by the preamble where you may put your customized global commands, and arrived the body where you write your content on. The body of a LaTeX file should be placed between `\begin{document}` and `\end{document}`.
- A simple example:

```
\documentclass{beamer}
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
\usetheme{Warsaw}
\usecolortheme{dolphin}
\title{Tips on Beamer, Tikz and Bibtex}
%\subtitle{Tips on LaTeX}
\author{Fei Ye \inst{1} and Moshe Cohen \inst{2}}
\institute[Bar-Ilan University]{\inst{1, 2} Department of Mathematics\\
Bar-Ilan University}
\date{\color{blue}March 28, 2012}

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
\begin{document}
.....
\end{document}
```

# Frames

- The main input of beamer are frames.

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You can also use block environment for definitions, theorems, etc.

- ```
\begin{itemize}
\item<1-> The main input of beamer are frames.
\item<2-> \begin{theorem} Frames are back-bones of beamer slides. \end{theorem}
\item<3-> \begin{block}{This is a Block} block environment for
definitions, theorems, etc. \end{block}
\end{itemize}
```

# Title bar for this particular frame

It's as easy as beginning and ending each frame. Titles are easy, too.

```
%\begin{frame} <— take out %  
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- When you give a presentation using slides, try to keep the text short.
- You should explain in more detail as you speak.
- Don't just read what's on the slides.

- Print out handouts of your beamer by using

```
\documentclass[handout]{beamer}.
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\pgfdeclareimage[height=0.5cm]{university—logo}{biu—logo—en.pdf} and
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- A beamer quickstart <http://www.math.umbc.edu/~rouben/beamer/quickstart.html>

# Using color

Unlike in a research paper, **colors** are **useful** (if not **overdone**)!

|               |                                                    |                                                |
|---------------|----------------------------------------------------|------------------------------------------------|
| <b>gray</b>   | <code>\definecolor {gray}{rgb}{.5,.5,.5}</code>    | <code>\def\gray{\color{gray}}</code>           |
| <b>blue</b>   | <code>\definecolor {blue}{rgb}{0,0,1}</code>       | <code>\def\blue{\color{blue}}</code>           |
| <b>red</b>    | <code>\definecolor {red}{rgb}{1,0,0}</code>        | <code>\def\red{\color{red}}</code>             |
| <b>green</b>  | <code>\definecolor {green}{rgb}{0,1,0}</code>      | <code>\def\green{\color{green}}</code>         |
| <b>green</b>  | <code>\definecolor {darkgreen}{rgb}{0,.5,0}</code> | <code>\def\darkgreen{\color{darkgreen}}</code> |
| <b>yellow</b> | <code>\definecolor {yellow}{rgb}{1,1,.4}</code>    | <code>\def\yellow{\color{yellow}}</code>       |
| <b>gold</b>   | <code>\definecolor {gold}{rgb}{.5,.5,.2}</code>    | <code>\def\gold{\color{gold}}</code>           |
| <b>purple</b> | <code>\definecolor {purple}{rgb}{.5,0,.5}</code>   | <code>\def\purple{\color{purple}}</code>       |

You can define your own using **RGB** by including two lines before `\begin{document}` and then using `{\blue TEXT HERE}` in the document.

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- A cool example:

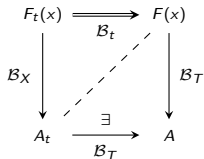


Figure: A simple commutative diagram by [Stefan Kottwitz](#)

```
\begin{tikzpicture}[font=\tiny]
  \matrix (m) [matrix of math nodes
    ,row sep=3em,column sep=4em,
    minimum width=2em]
  {F_t(x) & F(x) \\
    & \\
    A_t & A \\
  };
  \path[stealth]
    (m-1-1) edge node [left] {\mathcal{B}_X} (m-2-1)
    (m-1-1) edge node [right] {\mathcal{B}_t} (m-1-2)
    (m-2-1) edge node [below] {\mathcal{B}_T} (m-2-2)
    (m-1-2) edge node [below] {\mathcal{B}_T} (m-2-2)
    (m-1-2) edge node [right] {\mathcal{B}_T} (m-2-2)
    (m-1-2) edge [dashed,-] (m-2-1)
  ;
\end{tikzpicture}
```

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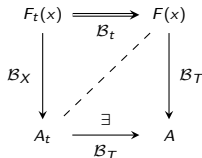


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```

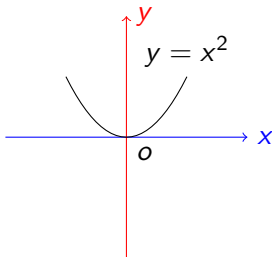
\begin{tikzpicture}[font=\tiny]
  \matrix (m) [matrix of math nodes
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  {F_t(x) & F(x) \\
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    (m-1-1) edge node [left] {\mathcal{B}_t} (m-1-2)
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    (m-1-2) edge node [below] {\mathcal{B}_T} (m-2-2)
    (m-1-2) edge node [right] {\mathcal{B}_T} (m-2-2)
    (m-1-1) edge [dashed,-] (m-2-2)
    ;
\end{tikzpicture}

```

- More cool examples:  
<http://www.texample.net/tikz/examples/>.

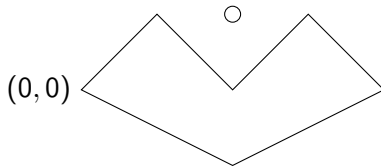
# A simple template

To use TikZ, we first need to add `\usepackage{tikz}` to the preamble. The following is example to plant TikZ picture in pdf by integrating TikZ sources into TeX files.



```
\begin{figure}[htbp]
\centering
\begin{tikzpicture}[scale=0.8, domain
=-2:2]
\draw[blue, ->] (-2, 0) -- (2, 0) node[
right]{$x$};
\draw[red, ->] plot (0, \x) node[right]
{$y$};
\draw[domain=-1:1] plot (\x, {\x*\x})
node[above]{$y=x^2$};
\draw (0, 0) node[below right]{$O$};
\end{tikzpicture}
\end{figure}
```

TikZ uses a grid system to create lines, circles, and other shapes.



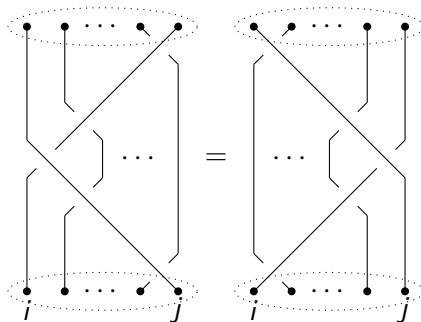
Text Block

```
\begin{figure}
\begin{center}
\begin{tikzpicture}
\draw (0,0) node[left] {$(0,0)$};
\draw (0,0)--(1,1)--(2,0)--(3,1)--(4,0)--(2,-1)--cycle;
\draw (2,1) circle (3pt);
\fill[color=green] (5,-.5) rectangle (7,.5);
\draw (6,0) node {Text Block};
\end{tikzpicture}
\end{center}
\end{figure}
```



The `\foreach \x` command lets you repeat several steps

```
\foreach \x/ \y in {0/3,1/2,3/0}  
{  
  \draw (\x,\y) — (\x+1,\y+1);  
  \draw[color=white, line width=10] (\x+1,\y) — (\x,\y+1);  
  \draw (\x+1,\y) — (\x,\y+1);  
}
```



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BibTeX stands for a tool and a file format used to process references in LaTeX

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- BibTeX format consists of entries and tags: e.g.

```
@article{A12,  
  author = "A, B",  
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  publisher = {Springer},  
  Year = 2012,  
}
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  Year = 2012,  
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```

- You can find bibtex formatted references online very easily and store (e.g. through JabRef) the information in a file yourfilename.bib. A bib file is like a database.

# How to use BibTeX

- Change display style of the bibliography: `\bibliographystyle {}` (put in preamble). Some packages (e.g. bibunits, natbib etc.) can create more fancy styles.

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- Generate bibliography: L-B-L-L. Put your bib file (e.g. bibliography.bib) in the same folder. Input the command `\bibliography{bibliography}` at the right place. Compile your LaTeX file in the order: latex/pdflatex→bibtex→latex/pdflatex → latex/pdflatex.

# Obtaining bibliographies from MathSciNet

If you are on a departmental computer, you can access MathSciNet through the  $\mathcal{AMS}$ : <http://www.ams.org/mathscinet/>

From here you can look up any published article or book.

Click the MR number to take you to the reference and “Select alternative format” from the drop-down menu to choose “BibTeX”

Copy and paste into your .bib file, change the reference tag, and delete (or comment out using %) the MRNUMBER line.



# Creating your .bib file

Open a new file in a TeX editor and save as `bibliographyname.bib`

If you read an article off arXiv.org, you can prepare your own reference:

```
@unpublished{KroMro,  
  AUTHOR = {Kronheimer, P. B. and Mrowka, T. S.},  
  TITLE = {Khovanov homology is an unknot-detector},  
  NOTE = {arXiv:1005.4346},  
  YEAR = {2010},  
  archivePrefix = arXiv,  
  eprint        = 1005.4346,  
  primaryClass  = math.GT,  
}
```

Make sure you put this file in the same folder as your .tex file.

Keep this .bib file updated with every book and paper you read, and you will never have to look for the references!

```
\bibliographystyle{amsalpha}  
\bibliography{11DecemberBibliography}
```



Béla Bollobás, *Modern graph theory*, Graduate Texts in Mathematics, vol. 184, Springer-Verlag, New York, 1998.



Louis H. Kauffman, *Formal knot theory*, Mathematical Notes, vol. 30, Princeton University Press, Princeton, NJ, 1983.