

LaTeX-Template for zbMATH Open Reviews

Purpose of this template

This template shows how your review will look like at zbMATH Open. You can test whether your LaTeX-code will compile properly on our system. However, be aware that there might be manual changes to your review and its published version on zbMATH Open will look slightly different than on this template.

How to use this template

Delete all the text in `zb-review.tex` and write your review into this file. If you want, you can change the metadata information at `zb-metadata.tex`. This is optional and just gives you a feeling how the final pdf at zbmath.org will look like. Finally, compile `zb-main.tex` using XeLaTeX.

LaTeX Format

Please prepare your review in standard LaTeX. You might use functions and macros from the following packages:

- `amsmath`, `amsfonts`, `amssymb`
- `stmaryrd`
- `mathrsfs`
- `tikz-cd`
- `mathtools`
- `gensymb`
- `textcomp`

Furthermore, you might use the macros defined in `zb-basics.sty`, that are:

- `\Im` and `\Re` for the imaginary and real part of a complex number, for example, $\operatorname{Re}(x + iy) = x$ and $\operatorname{Im}(x + iy) = y$.
- `\Aut` for the automorphism group of a set, e.g., $\operatorname{Aut}(X)$ for a set X .
- `\Hom` for the hom-Functor, e.g., $\operatorname{Hom}(A, B)$ stands for the set of homomorphisms from a set A to a set B .
- `\ran` for the range or image of a vector space, e.g., $\ker A = (\operatorname{ran} A^*)^\perp$.
- `\1` for the indicator function of a set, e.g.

$$\mathbb{1}_A = \begin{cases} 1 & \text{if } x \in A \\ 0 & \text{if } x \notin A \end{cases}.$$

- `\fint` for f , e.g.,

$$\fint_A u(y) d\mu(y) = \frac{1}{\mu(A)} \int_A u(y) d\mu(y)$$

- `\Sha` for the Tate–Shafarevich group $\text{III}(A/K)$ of an abelian variety A defined over a number field K .

Please do not use any self-defined macros or packages not listed above. If you feel that there is a missing package that we should add, please let us know.

Our PDFs are compiled using XeLaTeX, which supports unicode characters in the source files. Unicode allows the user to include accents and special characters coming from different Asian and European languages. For example you may enter accented characters directly (e.g., Lévy instead of `L\`evy`). However, please avoid including unicode characters in mathematical mode. For example, when you type Greek characters for variables please use `\(\beta\)` or `$_\beta$` obtaining β , instead of typing the unicode character directly.

Please do not include tables, large diagrams, drawings or formulas of minor importance. Use alternative fonts (bold, italics etc.) only if necessary, e.g., in formulas or for highlighting the authors of cited publications.

Mathematical Typesetting

When writing equations or diagrams please avoid the automatic numbering environments and replace them with their `""` analogues. For example, use

`\begin{equation*} \end{equation*}`

instead of

`\begin{equation} \end{equation}`.

The numbers on equations, definitions, diagrams, etc. should be set manually. You can do this by typing, for instance, `\tag{1}` or `\tag{*}`.

For example

```
\begin{equation*}
  \sum_{n=1}^{\infty} \frac{1}{n^2} = \frac{\pi^2}{6} \tag{1} \label{eq:1}
\end{equation*}
```

gives

$$(1) \qquad \sum_{n=1}^{\infty} \frac{1}{n^2} = \frac{\pi^2}{6}$$

An equation can be referenced via `\ref{key}` if it is labeled by `\label{key}`. The formula above can be referenced via `\ref{eq:1}`:

Equation 1 was proven by Leonhard Euler in his paper *De summis serierum reciprocarum*.

For inline mathematical formula we prefer to use `\(...\)` over `$...$`. Similarly, we recommend to use `\[...\]` instead of `$$...$$`.

Matrices We give a short description how to type matrices with `amsmath`. For more details we refer to the documentation of [amsmath](#) on ctan.

`amsmath` provides several environments for matrices using different brackets. For example the code

```
\[
\begin{pmatrix} a & b \\ c & d \end{pmatrix} \quad
\begin{matrix} a & b \\ c & d \end{matrix} \quad
\begin{bmatrix} a & b \\ c & d \end{bmatrix} \quad
\begin{Bmatrix} a & b \\ c & d \end{Bmatrix} \quad
\begin{vmatrix} a & b \\ c & d \end{vmatrix} \quad
\begin{Vmatrix} a & b \\ c & d \end{Vmatrix}
\]
```

generates these four matrices

$$\begin{pmatrix} a & b \\ c & d \end{pmatrix} \quad \begin{matrix} a & b \\ c & d \end{matrix} \quad \begin{bmatrix} a & b \\ c & d \end{bmatrix} \quad \begin{Bmatrix} a & b \\ c & d \end{Bmatrix} \quad \begin{vmatrix} a & b \\ c & d \end{vmatrix} \quad \begin{Vmatrix} a & b \\ c & d \end{Vmatrix}.$$

If you want to use a matrix in inline math mode, then you might use `\smallmatrix`, e.g. $\begin{pmatrix} 1 & 2 \\ 3 & 4 \end{pmatrix}$ is typed via

```
\(\left(\begin{smallmatrix} 1&2 \\ 3&4 \end{smallmatrix}\right)\right).
```

Observe that you have to add your own delimiter to the `smallmatrix` environment, here we use `\left(` and `\right)`.

Commutative Diagrams The package `tikz-cd` is designed to draw commutative diagrams. They are constructed inside `\begin{tikzcd}...\end{tikzcd}`. Its usage is similar to the one of tables (`&` for columns and `\\` for rows). Arrows are drawn using the command `\arrow[options]`. The direction of an arrow is specified by a string of characters `r, l, u, d` (right, left, up, down) and labels are added using quotes `"<label>"`. We give examples of some commutative diagrams that occur regularly.

A short exact sequence $0 \longrightarrow A \xrightarrow{f} B \xrightarrow{g} C \longrightarrow 0$ can be easily typed using `tikz-cd` by

```
\begin{tikzcd}
0 \arrow[r] & A \arrow[r, "f"] & B \arrow[r, "g"] & C \arrow[r] & 0
\end{tikzcd}
```

The option `column sep` specifies the space between two consecutive columns. If we set this option to `small`

```
\begin{tikzcd}[column sep=small]
  0\arrow[r] & A \arrow[r, "f"] & B\arrow[r, "g"] & C\arrow[r] & 0,
\end{tikzcd}
```

the arrows of the short exact sequence $0 \rightarrow A \xrightarrow{f} B \xrightarrow{g} C \rightarrow 0$ are shorter.

Next, we give an example of a classical "square" commutative diagram, where we use `column sep` and `row sep` to specify the space between consecutive columns and rows, respectively. The diagram

$$\begin{array}{ccc} A & \xrightarrow{f} & B \\ \downarrow g & & \downarrow h \\ C & \xrightarrow{k} & D \end{array}$$

is generated by

```
\[
\begin{tikzcd}[column sep=large, row sep=large]
  A \arrow[r, "f"] \arrow[d, "g"] & B \arrow[d, "h"] \\
  C \arrow[r, "k"] & D
\end{tikzcd}
\].
```

A "triangular" diagram as

$$\begin{array}{ccc} A & \xrightarrow{f} & B \\ \pi \downarrow & \nearrow \tilde{f} & \\ A/\ker(f) & & \end{array}$$

can be drawn using

```
\[
\begin{tikzcd}[row sep = large]
  A\arrow[d, "\pi" '] \arrow[r, "f"] & B \\
  A/\ker(f)\arrow[ru, dashrightarrow, "\tilde{f} ' ] & 
\end{tikzcd}
\].
```

For more details on the use of [tikz-cd](#) we refer to its documentation on ctan where examples of more complicated diagrams are given.

References References to related work are always appreciated. When giving references, please try to be as specific and accurate as possible so that the references can

MSC:

- 90C10 Integer programming
- 90-01 Introductory exposition (textbooks, tutorial papers, etc.) pertaining to operations research and mathematical programming
- 90C05 Linear programming
- 11D04 Linear Diophantine equations
- 11Y16 Number-theoretic algorithms; complexity

Cited in **1** Review
Cited in **205** Documents

\textit{A. Schrijver}, Theory of linear and integer programming. Repr. Chichester: Wiley (1998; Zbl 0970.90052)

BibTeX

Cite

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Figure 1: Cite Button at zbmath.org.

be identified unambiguously. You may use the [zbMATH Document Search](#) or the [zbMATH Citation Matcher](#) to look up references. The Cite Button for the respective zbMATH item gives the reference in the proper format for a zbMATH Open review, see Figure 1.

Example 1: Book Article ([Zbl 0970.90052](#))

[A. Schrijver, Theory of linear and integer programming. Repr. Chichester: Wiley (1998; Zbl 0970.90052)]

Example 2: Journal Article ([Zbl 0239.05111](#))

[L. Lovász, Discrete Math. 2, 253–267 (1972; Zbl 0239.05111)]

Review Submission

We prefer to receive your review electronically via our [Web Submission Form](#). Just copy the text of `zb-review.tex` into the field for the review text, please do not copy anything from `zb-main.tex` or `zb-basics.sty` into this field. There are two extra fields for keywords and MSC codes, respectively.

Alternatively, you may send your review by e-mail to review-submission@zbmath.org or via mail to our [postal address](#).

For more information on the zbMATH Open Reviewer Service we refer to our [guide for reviewers](#).

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