



# A guide to the beamer package kthpq

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General information

Customization and special commands

Long section title to showcase different line wrapping options, and some math showcases



# General information

# Introduction

- **kthpq** is a beamer template that implements the KTH Brand guidelines published in October 2023.
  - The starting point is the provided PowerPoint template, although some liberties have been taken regarding beamer-specific elements, such as block environments and math formatting.
- The name pays homage to **PQ** (Promenadorquestern och med Baletten Paletten), KTH's student jazz band :)

## General description

kthpq is not too special, but there are some things to note:

- Slides either contain line patterns from KTH's Brands, or they can be added with the command `\insertlines`. Some level of customization of the line patterns is possible; see next section.
- The header and footer are rather minimal.
  - The header shows the current section. This can be removed by adding `\def\insertsection{}` in the preamble.
  - The footer can be customized with the commands `\deffootline` and `\setfootline`. There are three arguments, which correspond to the left, middle, and right parts of the footer.
- Title and section slides contain neither the header nor the footer and are created by new commands `\inserttitlepage` and `\insertsectionpage`.

## In the background

- All extra files are found in the kthpq-files directory.
- kthpq requires compiling with **LuaLaTeX** in order to use the required font, **Figtree**.
  - For some reason the package fontspec used to load fonts is very verbose in its warnings, so it is called with the quiet option.
- Figtree is actually quite limited in scope, so kthpq also uses **Fira Math** for sans serif math symbols and **Bera Mono** for monospace fonts. The fonts are located in the fonts/ directory.
- KTH's visual elements are stored in the figs/ directory.

## How to use

- To use kthpq, add the command `\usepackage{kthpq}` in the preamble, probably towards the end.
- There are two options you can add when loading the theme:
  - `engine=lualatex` or `engine=pdflatex`. The default and recommended engine for compiling with kthpq is `lualatex`, which is the only way to get the recommended fonts Figtree and Georgia. The option `pdflatex` should be faster, but uses Helvetica and Bitstream Charter.
  - `mathshape=sf` or `mathshape=rm`. This determines the shape used for math. The default is `sf`, sans-serif, and `rm` corresponds to serif.

## License

- The source code of kthpq is distributed under the MIT license. See `LICENSE.txt` for more information, although if you are just using this template for a presentation, you shouldn't need to worry about it :)



## What is not included?

The following features are not included:

- Other types of headers or footers that are commonly used, such as miniframes, split, or infolines.
- Frame subtitles and sidebars.
- Article mode.
- Different sized slides: the template is designed for  $254 \times 143\text{mm}$  (16:9) slides. The options [17pt, lua $\text{\LaTeX}$ ] are highly recommended, and the option [t] is recommended, following the guidelines.

## Reporting issues

- This package is actively maintained by me (Isaac Ren), at least for the next few years (this is written in 2023).
- If you encounter any issues or have any feature requests, please contact me by email. I'm not sure who will see this, so I won't write my email out here: it's `firstlast@kth.se`.



# Customization and special commands

## New commands

- The title slide is inserted using the command `\inserttitlepage[template]`.
  - The default template option for title slides is center. There is currently one other option, left, which is shown on the next slide.
- The similar commands `\insertsectionpage` and `\insertendpage` insert section pages and end pages, respectively.
- You can also insert lines in any frame environment by adding the command `\insertlines`. See further for more detailed explanations.
- The commands `\deffootline` and `\setfootline` both take three arguments, which correspond to the left, middle, and right parts of the footer.



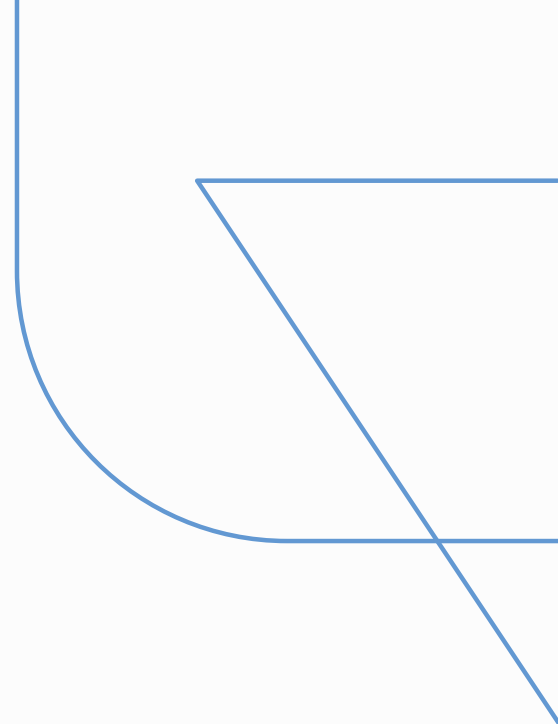
# A left-aligned title

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# Lines

- KTH's Brand guidelines allow users to insert certain abstract line patterns on slides.
- kthpq comes with premade selections of lines. These are contained in macros of the form `\linescardinal`, where *cardinal* is one of the following: northwest, northeast, east, southeast (with some variants). These can be found in `kthpq-files/beamerinnerthemekthpq.sty`.
- The command `\insertlines` will insert `\linesnortheast`. This is what you see on this slide.



# Smaller changes

The following small features are also included and can be customized:

- The `\emph` command has been changed to **bold** instead of *italic*. A new beamer color `emph` has also been added, which is used by the command
- All of KTH's recommended colors have been introduced and can be used to customize the color theme. See `kthpq-files/beamercolorthemekthpq.sty` for details.



Long section title to showcase different line wrapping options, and some math showcases





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# Prime numbers

## Theorem

There is no largest prime number.

## Proof.

1. Suppose  $p$  were the largest prime number.
2. Consider  $q := p! + 1$ .
3.  $q$  is not divisible by any number  $\leq p$ , so either it is prime or it is divisible by a prime number strictly greater than  $p$ .
4. Contradiction, so there is no largest prime number.





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## Examples

The following are **prime numbers**:

2, 3, 5, 7, 11, 13, 17, 19, 23.

## Warning

The number 1 is not prime!

## A more complicated formula [Rie59]

Defining the **logarithmic integral** and **Riemann's prime-power counting function** respectively as

$$\operatorname{li}(x) := \int_0^x \frac{dt}{\ln t} \quad \text{and} \quad \Pi_0(x) := \frac{1}{2} \left( \sum_{p,n:p^n < x} \frac{1}{n} + \sum_{p,n:p^n \leq x} \frac{1}{n} \right),$$

where  $p$  spans prime numbers, we have the equation

$$\Pi_0(x) = \operatorname{li}(x) - \sum_{\rho} \operatorname{li}(x^{\rho}) - \ln 2 + \int_x^{\infty} \frac{dt}{t(t^2 - 1) \ln t},$$

where  $\rho$  spans the nontrivial zeros of the Riemann zeta function and  $x > 1$ .



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## References

- [Rie59] G. F. B. Riemann, **Über die Anzahl der Primzahlen unter einer gegebenen Größe**, Monatsberichte der Königlich Preußischen Akademie der Wissenschaften (Nov. 1859), 671–680.

