

Simple guide to using $\text{KAT}_{\text{E}}\text{X}$

[HTML version](#)
[LaTeX file](#)
[JavaScript file](#)
[Katex Live Demo](#)

Requirements

This shows how to use $\text{KAT}_{\text{E}}\text{X}$ using pure JavaScript without installing extra programs, so will work on any machine.

1. katex files in [GitHub KaTeX Downloads](#), katex.zip or katex.tnar.gz
You only need katex.min.css, katex.min.js and the fonts and images folders (see [Font Options](#))
Alternatively you can include the files from Cloudflare CDN (see [README.md](#)).
2. smrender.js

Firefox Fonts

Firefox possibly might not allow the fonts folder to be in a separate directory.

Either

put a copy of katex.min.css and the fonts folder in the same directory as the HTML document

Note that, from Firefox 68, this won't work if the file is a local one so URI is `file:///`,

See [Reason: CORS request not HTTP](#). In this case use katex.min.css from the CDN [README.md](#).

or

use one of the solutions at [Cross Domain Fonts](#)

Implementation

(Taken from [\[2\]](#) If you have only a few equations on your page, you can proceed as follows:

```
<span id="mykatex1">...</span>
<script>
katex.render("f(a,b,c) = (a^2+b^2+c^2)^3", mykatex1);
</script>
```

which gives

$$f(a, b, c) = (a^2 + b^2 + c^2)^3$$

This will place the equation into your Web page, as properly rendered maths. A second equation would need a new id on the span, and in the script, like this:

```
<span id="mykatex2">...</span>
<script>
katex.render("f(a,b,c) = (a^2+b^2+c^2)^3", mykatex2);
</script>
```

$$f(a, b, c) = (a^2 + b^2 + c^2)^3$$

Autorendering

If you have lots of equations on the page you need auto-rendering which renders the equations inside prescribed delimiters (Katex does have an autorendering plugin in the contrib subfolder you may wish to use). The work is done by *smrender.js* (see [below](#)) following an idea from [\[2\]](#) and there are two rendering modes:

Displayed formula

The following alternatives have the same effect

```
<div class="maths">...</div>
\[...\] (auto changed to div)
```

Inline formula

These have the same effect

```
<span class="maths">...</span>
$ ... $ (auto changed to span - use \$ for actual dollar sign in text or \\$ in maths)
\\( ...\\> (auto changed to span)
<p class="maths">...</p>
```

Examples

Displayed formula

Aligned at equals sign

```
\begin{aligned}
\int_0^1 \frac{x^4(1-x)^4}{1+x^2} dx &= \frac{22}{7} - \pi \\
\int_{-\infty}^{\infty} e^{-x^2} dx &= \sqrt{\pi}
\end{aligned}
```

$$\int_0^1 \frac{x^4(1-x)^4}{1+x^2} dx = \frac{22}{7} - \pi$$

$$\int_{-\infty}^{\infty} e^{-x^2} dx = \sqrt{\pi}$$

Inline formula

$\int_{-\infty}^{\infty} e^{-x^2} dx = \sqrt{\pi}$ is a well-known result.

Formulae can be on more than one line

```
\sum_{i=1}^{\infty} \frac{1}{n^2}
=\frac{\pi^2}{6}
```

gives $\sum_{i=1}^{\infty} \frac{1}{n^2} = \frac{\pi^2}{6}$

Errors

\LaTeX errors are shown in red. For example, wrong spelling of ∞ :

```
\[
\int_{-\infinity}^{\infinity} e^{-x^2} dx = \sqrt{\pi}
\]
```

ParseError: KaTeX parse error: Expected '}', got '\infinity' at position 16: int_{-\infinity}^{\infinity} e^{-

Errors should not stop rendering of further correct formulae: $|x| = \begin{cases} x, & x \geq 0, \\ -x, & x < 0. \end{cases}$

Note

Using less than signs before a letter such as $a < b$ will cause strange \LaTeX errors. This is because HTML misreads $a < b$ so passes a malformed string to \LaTeX .

The solution is to use spaces in $a < b$ to get $a < b$. Alternatively, \LaTeX recognises \lt and $a \text{\lt} b$ gives $a < b$

Copy and Paste

Loading the optional copy-tex files allows the reader to copy the formula and paste into a text editor to recover the LaTeX syntax. This is done by adding

```
<script src="copy-tex.min.js"></script>
<link rel="stylesheet" href="copy-tex.min.css">
```

to the head element and works in most browsers, though not Edge or Internet Explorer. You can try it with the formulæ on this page. See [Copy-tex extension](#) for full details.

KaTeX Commands

These are listed in KaTeX's Wiki at [Function Support in KaTeX](#)

[Sample KaTeX Document](#) and its source code show how to implement automatic equation numbering, referencing and bibliography numbering.

Minimal autorender page

```
<!DOCTYPE html>
<html lang="en">
<head>
<title>Minimal example</title>
<link rel="stylesheet" href="katex.min.css">
<script src="katex.min.js"></script>
<script src="smrender.js"></script>
<style>
/* optional - uncomment and customise next line to change maths font size
.katex { font-size: 1em !important; }
*/
</style>
</head>

<body onload="myRender()">
This is inline  $\left\{\frac{1}{n^2}\right\}$ 
but this is displayed  $\int_0^1 \frac{x^4(1-x)^4}{1+x^2} dx = \frac{22}{7} - \pi$ 
centred on its own line.
</body>
</html>
```

smrender.js

smrender.js goes through the html file automatically rendering all the formulae. Here are the contents with comments:

```
function myRender()
{
  // replace text dollar signs by %% temporarily then
  // replace $...$ by <span class="maths">...</span>
  // regular expression  $([sS]+?)\$/g$  consists of all whitespace  $\backslash s$ 
  // and non-whitespace characters  $\backslash S$  between the dollar signs. See [4]
document.body.innerHTML = document.body.innerHTML.replace(/\\\$/g, '%\%');
document.body.innerHTML = document.body.innerHTML.replace(/\\$([sS]+?)\$/g, '<span class="maths\>');
  // replace  $[ ... \]$  by <div class="maths"> ... </div>
  // but don't replace eg  $\llbracket 1ex \rrbracket$  so temporarily rename them
document.body.innerHTML = document.body.innerHTML.replace(/\\\[ \]/g, '%\%');
document.body.innerHTML = document.body.innerHTML.replace(/\\\[ \]/g, '<div class="maths\>');
document.body.innerHTML = document.body.innerHTML.replace(/\\\[ \]/g, '</div\>');
  // put back eg  $\llbracket 1ex \rrbracket$ 
document.body.innerHTML = document.body.innerHTML.replace(/%\%\/g, '\\\[ \]');
  // replace  $( ... )$  by <span class="maths"> ... </span>
```

```

document.body.innerHTML = document.body.innerHTML.replace(/\\\(/g, '<span class="maths\">');
document.body.innerHTML = document.body.innerHTML.replace(/\\\)/g, '</span>');
// put back text dollar signs
document.body.innerHTML = document.body.innerHTML.replace(/%\%/g, '\$');

// Get all <div or span or p class = "maths"> elements in the document
var x = document.getElementsByClassName('maths');

// go through each of them in turn
for (var i = 0; i < x.length; i++) {
try {
if(x[i].tagName == "DIV"){
t= katex.render(x[i].textContent,x[i],{ displayMode: true });
} else {
t= katex.render(x[i].textContent,x[i]);
}
}
catch(err) {
x[i].style.color = 'red';
x[i].textContent= err;
}
}

// Optional. Allows use of delimiters in document without them being replaced
// Use \$ or %% for $, %[ for \[, %] for \], %( for \(\, %) for \)
// the following will convert them to the appropriate delimiters
document.body.innerHTML = document.body.innerHTML.replace(/%\%[/g, '\\\[');
document.body.innerHTML = document.body.innerHTML.replace(/%\%]/g, '\\\]');
document.body.innerHTML = document.body.innerHTML.replace(/%\%[/g, '\\\[');
document.body.innerHTML = document.body.innerHTML.replace(/%\%]/g, '\\\]');
}

```

References

I am grateful to the following as without them this simple guide could not have existed

- [1] [KaTeX](#)
- [2] [KaTeX - a new way to display math on the Web](#)
- [3] [KaTeX Demo](#)
- [4] [JavaScript RegExp Reference](#)

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