

The unicode-math test suite

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1 Preamble

The following pieces of output are generated from the code shown. As well as being good minimal examples, these tests are useful to ensure that new bugs don't affect old behaviour. When the test suite is run, the new output is compared pixel by pixel with that shown here and warnings produced if the outputs are not identical.

2 Test files for both engines

Only the Lua^AT_EX output is shown; there will be (usually only) negligible differences between the outout between the two engines.

2.1 Test F-active-sscripts-L

```
\input{umtest-preamble}
\usepackage{unicode-math}
\setmathfont{Cambria Math}
\setlength\parskip{12pt}
\begin{document}
 $\$x_{012}\$ \quad \$x_{123}\$ \quad \$x_{234}\$ \quad \$x_{345}$ 

 $\$x_{9+-}\$ \quad \$x_{+-(}\$ \quad \$x_{-(=}\$ \quad \$x_{(=}$ 

 $\$x^{0\frac{1}{2}+})^{\frac{1}{2}2}\$ \quad \$x^{\frac{1}{2}+})^{\frac{1}{2}2}\$ \quad \$x^{\frac{1}{2}2}\$ \quad \$$ 

 $\$x_{34}^{2\frac{1}{2}+})^{\frac{1}{2}2}\$$ 
\end{document}
```

$$\begin{array}{l} x_{012} x_{123} x_{234} x_{345} x_{456} x_{567} x_{678} x_{789} x_{89+} \\ x_{9+-} x_{+--} (x_{--} = x_{(=)} x_{=})_a x_{)ae} x_{a eo} x_{e ox} x_{ox0} x_{x01} \\ x_{789}^{0(i+)+n_2} x_{89+}^{1(i+)+n_2} x_{+}^{n_2} x^{2(i+)+n} \\ x_{789}^{2(i+)+n} x_{89+}^{2(i+)+n} x_{+}^{2(i+)+n} x^{2(i+)+n} \end{array}$$

2.2 Test F-alpha-spaces-L

<pre> \input{umtest-preamble} \usepackage{amsmath} \usepackage[math-style=ISO]{unicode-math} \setmathfont{xits-math.otf} \setmathfont[range=\mathit/{latin, greek, Greek}]{Asana-Math.otf} \begin{document} \$abc\$ \$ABC\$ \$\alpha\beta\gamma\$ \$\Alpha\Beta\Gamma\$ \end{document} </pre>	$abc\ ABC\ \alpha\beta\gamma\ AB\Gamma$
---	---

 $abc \ ABC \ \alpha\beta\gamma \ AB\Gamma$

2.3 Test F-arrow-accents-L

```
\input{umtest-preamble}
\usepackage{unicode-math}
\begin{document}
\setmathfont{XITS Math}
\[ \vec{a} \quad \vec{a} \quad \vec{abc} \quad \overrightarrow{abc} \quad \underline{abc}
\overrightarrow{abc} \quad \underrightarrow{abc} \quad \]

\setmathfont{Cambria Math}
\[ \vec{a} \quad \vec{a} \quad \vec{abc} \quad \overrightarrow{abc} \quad \underline{abc}
\overrightarrow{abc} \quad \underrightarrow{abc} \quad \]
\end{document}
```

\vec{a} \vec{a} \vec{abc} \overrightarrow{abc} \underline{abc}

\vec{a} \vec{a} \vec{abc} \overrightarrow{abc} \underline{abc}

2.4 Test F-mathstyle-french-L

```
\input{umtest-preamble}
\usepackage[math-style=french]{unicode-math}
\setmathfont{Cambria Math}
\begin{document}
\[\text{\LATINText}\]
\[\text{\latintext}\]
\[\text{\LATINmath}\]
\[\text{\latinmath}\]
\end{document}
```

ABCDEFGHIJKLMNOPQRSTUVWXYZ

abcdefghijklmnopqrstuvwxyz

ABCDEFGHIJKLMNOPQRSTUVWXYZ

abcdefghijklmnopqrstuvwxyz

2.5 Test F-mathstyle-iso-L

```
\input{umtest-preamble}
\usepackage[math-style=ISO]{unicode-math}
\setmathfont{Cambria Math}
\begin{document}
\[\text{\LATINText}\]
\[\text{\latintext}\]
\[\text{\LATINmath}\]
\[\text{\latinmath}\]
\end{document}
```

ABCDEFGHIJKLMNOPQRSTUVWXYZ

abcdefghijklmnopqrstuvwxyz

ABCDEFGHIJKLMNOPQRSTUVWXYZ

abcdefghijklmnopqrstuvwxyz

2.6 Test F-mathstyle-literal-L

```
\input{umtest-preamble}  
\usepackage[math-style=literal]{unicode-math}  
\setmathfont{Cambria Math}  
\begin{document}  
\[ \text{LATINtext} \]  
\[ \text{latin} \]  
\[ \text{LATINmath} \]  
\[ \text{latin} \]  
\end{document}
```

ABCDEFGHIJKLMNOPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz
ABCDEFGHIJKLMNOPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz

2.7 Test F-mathstyle-tex-L

```
\input{umtest-preamble}  
\usepackage[math-style=TeX]{unicode-math}  
\setmathfont{Cambria Math}  
\begin{document}  
\[ \text{LATINtext} \]  
\[ \text{latin} \]  
\[ \text{LATINmath} \]  
\[ \text{latin} \]  
\end{document}
```

ABCDEFGHIJKLMNOPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz
ABCDEFGHIJKLMNOPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz

2.8 Test F-mathstyle-upright-L

```
\input{umtest-preamble}  
\usepackage[math-style=upright]{unicode-math}  
\setmathfont{Cambria Math}  
\begin{document}  
\[ \text{LATINtext} \]  
\[ \text{latin} \]  
\[ \text{LATINmath} \]  
\[ \text{latin} \]  
\end{document}
```

ABCDEFGHIJKLMNOPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz
ABCDEFGHIJKLMNOPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz

2.9 Test F-mathversion-L

```
\input{umtest-preamble}
\usepackage{unicode-math}
\setmathfont{xits-math.otf}
\setmathfont[version=bold,Colour=009900]{xits-math.otf}
\begin{document}
\[
(x+y)^{\{z+c\}^{\{a+b\}}}
\]
\mathversion{bold}
\[
(x+y)^{\{z+c\}^{\{a+b\}}}
\]
\end{document}
```

$$(x+y)^{z+c^{a+b}}$$

$$(x+y)^{z+c^{a+b}}$$

2.10 Test F-nolimits-spec-L

```
\input{umtest-preamble}
\usepackage{unicode-math}
\setmathfont{xits-math.otf}
\begin{document}
\[ \iiint_V \]
\removenolimits\iiint
\[ \iiint_V \]
\addnolimits\iiint
\[ \iiint_V \]
\end{document}
```

$$\iiint_V$$

$$\iiint_V$$

$$\iiint_V$$

2.11 Test F-over-under-2-L

% see <http://github.com/wspr/unicode-math/issues/212>

```
\input{umtest-preamble}
\usepackage{unicode-math}
\setmathfont[Colour=FF0000]{xits-math.otf}
\setmathfont
[range={\mathop},Colour=0000FF]
{xits-math.otf}

\begin{document}

\[ \underbrace{\int x \, dx}_{xyz} \]
\quad
\overbrace{\int x \, dx}^{xyz} \]

\end{document}
```

$$\underbrace{\int x dx}_{xyz} \quad \overbrace{\int x dx}^{xyz}$$

2.12 Test F-over-under-L

```
\input{umtest-preamble}
\usepackage{unicode-math}
\setmathfont{xits-math.otf}
\begin{document}
\[
\overbrace{a+b+c+d}^{e/f/g/h}
\overbracket{a+b+c+d}^{e/f/g/h}
\overparen{a+b+c+d}^{e/f/g/h}
\]
\[
\underbrace{a+b+c+d}_{e/f/g/h}
\underbracket{a+b+c+d}_{e/f/g/h}
\underparen{a+b+c+d}_{e/f/g/h}
\]
\end{document}
```

$$\begin{array}{c} \overbrace{a+b+c+d}^{e/f/g/h} \overbrace{a+b+c+d}^{e/f/g/h} \overbrace{a+b+c+d}^{e/f/g/h} \\ a+b+c+d \ a+b+c+d \ a+b+c+d \\ \overbrace{a+b+c+d}^{e/f/g/h} \overbrace{a+b+c+d}^{e/f/g/h} \overbrace{a+b+c+d}^{e/f/g/h} \\ a+b+c+d \ a+b+c+d \ a+b+c+d \\ \underbrace{a+b+c+d}_{e/f/g/h} \underbrace{a+b+c+d}_{e/f/g/h} \underbrace{a+b+c+d}_{e/f/g/h} \\ a+b+c+d \ a+b+c+d \ a+b+c+d \end{array}$$

2.13 Test F-pkg-url-L

```
\input{umtest-preamble}
\usepackage{unicode-math}
\setmainfont{TeX Gyre Pagella}
\setsansfont{TeX Gyre Adventor}
\setmonofont{TeX Gyre Cursor}
\setmathfont{Cambria Math}
\usepackage{url}
\begin{document}
\centering\obeylines
\url{http://www.lmgtfy.com/}
\url{?q="~!@#$$%^&*()<>`'`}
\urlstyle{rm}
\url{http://www.lmgtfy.com/}
\url{?q="~!@#$$%^&*()<>`'`}
\urlstyle{sf}
\url{http://www.lmgtfy.com/}
\url{?q="~!@#$$%^&*()<>`'`}
\end{document}
```

```
http://www.lmgtfy.com/
?q="~!@#$$%^&*()<>`'`
http://www.lmgtfy.com/
?q="~!@#$$%^&*()<>`'
http://www.lmgtfy.com/
?q="~!@#$$%^&*()<>`'
```

2.14 Test F-primes-1-L

```
\input{umtest-preamble}
\usepackage{amsmath,unicode-math}
\setmathfont{Cambria Math}
\begin{document}
[{$\backslash\prime\prime\prime$}]
[{$\backslash\prime\prime\prime\prime\prime\prime\prime\prime$}]
[{$x'$}]
[{$x''$}]
[{$x''''$}]
[{$x\prime$}]
[{$x\prime\prime$}]
[{$x\prime\prime\prime\prime\prime\prime\prime\prime$}]

$x\prime\prime\prime\prime$
$x\prime\prime\prime\prime$
$x\prime\prime$
$x\prime$
\end{document}
```

$$\begin{array}{c} [x'''] [x'''''] [x'] [x'''] [x'''''] [x'] [x'''] [x'''''] \\ x'''''' x'''''' x''' x''' \end{array}$$

2.15 Test F-primes-2-L

```
\input{umtest-preamble}
\usepackage{unicode-math}
\setmathfont{Asana Math}
\begin{document}
[$x_{\{x\}}'$]
[$x_{\{x\}}\boxminus$]
[$x_{\{x\}}\backprime$]
[$x_{\{x\}}\`$]
[$x_{\{x\}}\backprime$]

[$x'_x$]
[$x_{\boxminus}$]
[$x\backprime_x$]
[$x\`_x$]
[$x\backprime_x$]

[$x_{\{x'\}}$]
[$x_{\{x\boxminus\}}$]
[$x_{\{x\backprime\}}$]
[$x_{\{x'\}}$]
[$x_{\{x\backprime\}}$]

\end{document}
```

$$\begin{array}{ccccc} [x'_x] & [x'_x] & [x_x'] & [x'_x] & [x_x\backslash] \\ [x'_x] & [x'_x] & [x'_x] & [x'_x] & [x\backslash_x] \\ [x_{x'}] & [x_{x'}] & [x_{x'}] & [x_{x'}] & [x_{x\backslash}] \end{array}$$

2.16 Test F-primes-back-L

```
\input{umtest-preamble}
\usepackage{amsmath,unicode-math}
\setmathfont{Asana Math}
\begin{document}
[$\{x\backprime\backprime\backprime\}$]
[$\{x\backprime\backprime\backprime\backprime\backprime\backprime\}$]
[$\{x'\}$]
[$\{x'\'\}$]
[$\{x'\'\'\}\$]
[$\{x\boxminus\}$]
[$\{x\boxminus\boxminus\}$]
[$\{x\boxminus\boxminus\backprime\boxminus\}$]

$x'\boxminus\boxminus\boxminus$
$x\boxminus\boxminus\boxminus\`$
$x\boxminus\boxminus$
$x\boxminus$

\end{document}
```

$$\begin{array}{ccccccc} [x\backslash\backslash] & [x\backslash\backslash\backslash\backslash] & [x'] & [x'''] & [x'''''] & [x'] & [x'''] & [x'''''\backslash] \\ [x\backslash\backslash\backslash\backslash\backslash\backslash\backslash\backslash] & [x\backslash\backslash\backslash\backslash\backslash\backslash\backslash\backslash\backslash\backslash\backslash\backslash\backslash\backslash\backslash\backslash] & & & & & & \end{array}$$

2.17 Test F-query-mathstyle-L

```
\input{umtest-preamble}

\usepackage{unicode-math}
\setmathfont[Colour=FF0000]{xits-math.otf}

\begin{document}

\ExplSyntaxOn
[$\l_um_mathstyle_tl$]\
[$\mathrm{\l_um_mathstyle_tl}$]\
[$\mathup{\l_um_mathstyle_tl}$]\
[$\mathit{\l_um_mathstyle_tl}$]\

[$\mathbf{\l_um_mathstyle_tl}$]\
[$\mathbf{fit}\l_um_mathstyle_tl$]\
[$\mathbf{fup}\l_um_mathstyle_tl$]\

[$\mathsf{\l_um_mathstyle_tl}$]\
[$\mathsf{fit}\l_um_mathstyle_tl$]\
[$\mathsf{fup}\l_um_mathstyle_tl$]\

[$\mathbf{fsf}\l_um_mathstyle_tl$]\
[$\mathbf{fsfit}\l_um_mathstyle_tl$]\
[$\mathbf{fsfup}\l_um_mathstyle_tl$]\

\end{document}
```

\l_um $\mathit{\l_um}$ $\mathbf{\l_um}$ $\mathbf{fit}\l_um$ $\mathbf{fup}\l_um$ $\mathsf{\l_um}$ $\mathsf{fit}\l_um$ $\mathsf{fup}\l_um$ $\mathbf{fsf}\l_um$ $\mathbf{fsfit}\l_um$ $\mathbf{fsfup}\l_um$

2.18 Test F-range-prime-check-L

```
%
% See http://github.com/wspr/unicode-math/issues/171
%
% The fix is related to the fact that primes use the `mathactive'
% section of the unicode-math code, which is now controlled by
% the parsing range feature (as it always should have been).  $f(x) = \int f'(x)dx$ 

\input{umtest-preamble}
\usepackage{unicode-math}
\setmathfont[Colour=FF0000]{xits-math.otf}
\setmathfont
  [range=\mathop,Colour=0000FF]
  {xits-math.otf}

\begin{document}
\[ f(x) = \int f'(x) dx \]
\end{document}
```

2.19 Test F-slash-delim-2-L

```
\input{umtest-preamble}
\usepackage{unicode-math}
\begin{document}
\newcommand\ARRAY[4]{%
  \begin{array}{cc}
    #1 & #2 \\
    #3 & #4
  \end{array}}
\def\test{\[
  \left.\left[\ARRAY a b c d\right]
  \middle\slash
  \left[\ARRAY 1 1 1 {\mathsf 0}\right]
  \right.\]}
\setmathfont
  [slash-delimiter=frac]{Cambria Math}
\setmathfont
  [range={\mathsfup},
   Color=0000FF]
  {STIXGeneral}
\test
\setmathfont
  [slash-delimiter=frac,
   range="2044,
   Color=FF0000]
  {Cambria Math}
\test
\end{document}
```

$$\left[\begin{array}{cc} a & b \\ c & d \end{array}\right] \bigg/ \left[\begin{array}{cc} 1 & 1 \\ 1 & 0 \end{array}\right]$$

$$\left[\begin{array}{cc} a & b \\ c & d \end{array}\right] \bigg/ \left[\begin{array}{cc} 1 & 1 \\ 1 & 0 \end{array}\right]$$

2.20 Test F-sqrt-L

```
\input{umtest-preamble}
\usepackage{unicode-math}
\setmathfont{Cambria Math}
\begin{document}
\[ \sqrt{\sin^2 x + \cos^2 x} = 1 \quad \backslash
\backslash \sqrt{1 + \sqrt{1 + \sqrt{1 + \sqrt{1 + x}}}} \backslash
\end{document}
```

$$\sqrt{\sin^2 x + \cos^2 x} = 1$$

$$\sqrt{1 + \sqrt{1 + \sqrt{1 + \sqrt{1 + x}}}}$$

2.21 Test F-sqrt-n-L

```
\input{umtest-preamble}
\usepackage{unicode-math}
\setmathfont{Cambria Math}
\begin{document}
\[ \sqrt[n]{1 + \sqrt[n]{1 + \sqrt[n]{1 + \sqrt[n]{1 + \sqrt[n]{1 + x}}}}} \backslash
\end{document}
```

$$\sqrt[n]{1 + \sqrt[n]{1 + \sqrt[n]{1 + \sqrt[n]{1 + \sqrt[n]{1 + x}}}}}$$

2.22 Test F-sscript-features-L

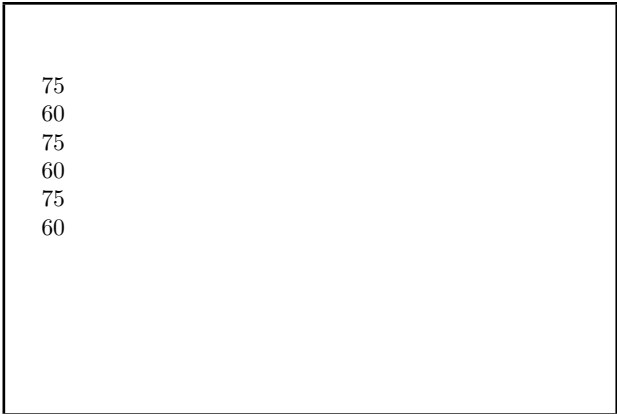
```
\input{umtest-preamble}
\usepackage{unicode-math}
\setmathfont[script-font      = {Asana Math},
              script-features = {Style=MathScript,Colour=FF0000},
              sscript-font    = {Cambria Math},
              sscript-features= {Style=MathScriptScript,Colour=0000FF}]
              {XITS Math}
\begin{document}
\[123456789^{123456789^{123456789}}\]
\end{document}
```



3 Lua^AT_EX test files

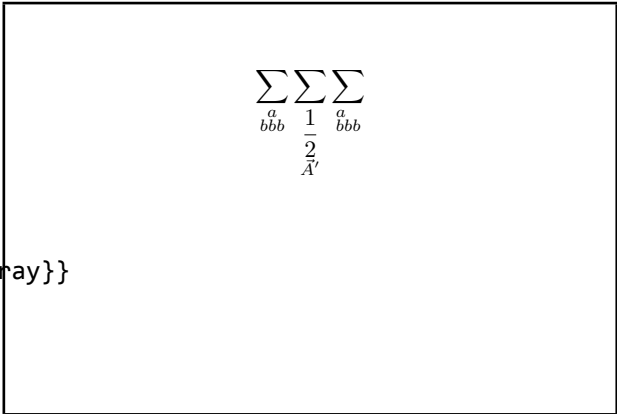
3.1 Test L-sscale-dimen

```
\input{umtest-preamble}
\usepackage{unicode-math}
\setmathfont{XITS Math}
\begin{document}
$ $ \\\
\number \fontdimen 10 \textfont 0 \\\
\number \fontdimen 11 \textfont 0 \\\
\number \fontdimen 10 \scriptfont 0 \\\
\number \fontdimen 11 \scriptfont 0 \\\
\number \fontdimen 10 \scriptscriptfont 0 \\\
\number \fontdimen 11 \scriptscriptfont 0
\end{document}
```



3.2 Test L600a

```
\input{umtest-preamble}
\usepackage{amsmath}
\begin{document}
\[
\sum_{\substack{a \\ bbb}} \sum_{\substack{1 \\ 2 \\ A'}} \sum_{\substack{a \\ bbb}}
\end{document}
```



3.3 Test L600b

```
\input{umtest-preamble}
\usepackage{amsmath}
\usepackage{unicode-math}
\setmathfont{Cambria Math}
\begin{document}
\[
\sum_{\substack{a \\ bbb}} \sum_{\substack{1 \\ 2 \\ \vec{A}'}} \sum_{\substack{a \\ bbb}}
\sum_{\substack{\dfrac{1}{2} \\ \vec{A}'}} \sum_{\substack{a \\ bbb}} \sum_{\substack{1 \\ 2 \\ \vec{A}'}} \sum_{\substack{a \\ bbb}}
\sum_{\begin{subarray}{l} a \\ bbb \end{subarray}} \sum_{\begin{subarray}{l} a \\ bbb \end{subarray}} \sum_{\begin{subarray}{l} a \\ bbb \end{subarray}}
\]
\end{document}
```

$$\sum_{\substack{a \\ bbb}} \sum_{\substack{1 \\ 2 \\ \vec{A}'}} \sum_{\substack{a \\ bbb}}$$

3.4 Test L600c

```
\input{umtest-preamble}
\usepackage{amsmath}
\usepackage{unicode-math}
\setmathfont{Asana Math}
\begin{document}
\[
\sum_{\substack{a \\ bbb}} \sum_{\substack{1 \\ 2 \\ \vec{A}'}} \sum_{\substack{a \\ bbb}}
\sum_{\substack{\dfrac{1}{2} \\ \vec{A}'}} \sum_{\substack{a \\ bbb}} \sum_{\substack{1 \\ 2 \\ \vec{A}'}} \sum_{\substack{a \\ bbb}}
\sum_{\begin{subarray}{l} a \\ bbb \end{subarray}} \sum_{\begin{subarray}{l} a \\ bbb \end{subarray}} \sum_{\begin{subarray}{l} a \\ bbb \end{subarray}}
\]
\end{document}
```

$$\sum_{\substack{a \\ bbb}} \sum_{\substack{1 \\ 2 \\ \vec{A}'}} \sum_{\substack{a \\ bbb}}$$

3.5 Test L600f

```
\input{umtest-preamble}
\usepackage{amsmath}
\usepackage{unicode-math}
\setmathfont{XITS Math}
\begin{document}
\[
\sum_{\substack{a \\ bbb}} \sum_{\substack{1 \\ 2 \\ \vec{A}'}} \sum_{\substack{a \\ bbb}}
\sum_{\substack{\dfrac{1}{2} \\ \vec{A}'}} \sum_{\substack{a \\ bbb}} \sum_{\substack{1 \\ 2 \\ \vec{A}'}} \sum_{\substack{a \\ bbb}}
\sum_{\begin{subarray}{l} a \\ bbb \end{subarray}} \sum_{\begin{subarray}{l} a \\ bbb \end{subarray}} \sum_{\begin{subarray}{l} a \\ bbb \end{subarray}}
\]
\end{document}
```

$$\sum_{\substack{a \\ bbb}} \sum_{\substack{1 \\ 2 \\ \vec{A}'}} \sum_{\substack{a \\ bbb}}$$

3.6 Test L601a

```

\input{umtest-preamble}
\usepackage{mathtools}
\begin{document}
\[
\frac{a^2 + b^2}{a^2 + b^2}
\frac{\cramped{a^2 + b^2}}{a^2 + b^2}
\frac{a^2 + b^2}{\cramped{a^2 + b^2}}
\]
\[
\frac{a^2 + b^2}{a^2 + b^2}
\frac{\cramped{a^2 + b^2}}{a^2 + b^2}
\frac{a^2 + b^2}{\cramped{a^2 + b^2}}
a^{\{
\frac{a^2 + b^2}{a^2 + b^2}
\frac{\cramped{a^2 + b^2}}{a^2 + b^2}
\frac{a^2 + b^2}{\cramped{a^2 + b^2}}
\}}
a^{\{
a^{\{
\frac{a^2 + b^2}{a^2 + b^2}
\frac{\cramped{a^2 + b^2}}{a^2 + b^2}
\frac{a^2 + b^2}{\cramped{a^2 + b^2}}
\}}
\}
\]
\end{document}

```

$$\frac{a^2 + b^2}{a^2 + b^2} \frac{a^2 + b^2}{a^2 + b^2} \frac{a^2 + b^2}{a^2 + b^2} a^{\frac{a^2+b^2}{a^2+b^2}} a^{\frac{a^2+b^2}{a^2+b^2}} a^{\frac{a^2+b^2}{a^2+b^2}} a^{\frac{a^2+b^2}{a^2+b^2}} a^{\frac{a^2+b^2}{a^2+b^2}}$$

3.7 Test L601b

```

\input{umtest-preamble}
\usepackage{mathtools}
\usepackage{unicode-math}
\setmathfont{Cambria Math}
\begin{document}
\[
\frac{a^2 + b^2}{a^2 + b^2}
\frac{\cramped{a^2 + b^2}}{a^2 + b^2}
\frac{a^2 + b^2}{\cramped{a^2 + b^2}}
\]
\[
\frac{a^2 + b^2}{a^2 + b^2}
\frac{\cramped{a^2 + b^2}}{a^2 + b^2}
\frac{a^2 + b^2}{\cramped{a^2 + b^2}}
a^{\{
\frac{a^2 + b^2}{a^2 + b^2}
\frac{\cramped{a^2 + b^2}}{a^2 + b^2}
\frac{a^2 + b^2}{\cramped{a^2 + b^2}}
\}}
a^{\{
a^{\{
\frac{a^2 + b^2}{a^2 + b^2}
\frac{\cramped{a^2 + b^2}}{a^2 + b^2}
\frac{a^2 + b^2}{\cramped{a^2 + b^2}}
\}}
\}}
\]
\end{document}

```

$$\frac{a^2 + b^2}{a^2 + b^2} \frac{a^2 + b^2}{a^2 + b^2} \frac{a^2 + b^2}{a^2 + b^2} a \frac{a^2 + b^2}{a^2 + b^2} \frac{a^2 + b^2}{a^2 + b^2} \frac{a^2 + b^2}{a^2 + b^2} a \frac{a^2 + b^2}{a^2 + b^2} \frac{a^2 + b^2}{a^2 + b^2} \frac{a^2 + b^2}{a^2 + b^2}$$

3.8 Test L601f

```

\input{umtest-preamble}
\usepackage{mathtools}
\usepackage{unicode-math}
\setmathfont{XITS Math}
\begin{document}
\[
\frac{a^2 + b^2}{a^2 + b^2}
\frac{\cramped{a^2 + b^2}}{a^2 + b^2}
\frac{a^2 + b^2}{\cramped{a^2 + b^2}}
\]
\(\frac{a^2 + b^2}{a^2 + b^2}\)
\(\frac{\cramped{a^2 + b^2}}{a^2 + b^2}\)
\(\frac{a^2 + b^2}{\cramped{a^2 + b^2}}\)
a^{
  \frac{a^2 + b^2}{a^2 + b^2}
  \frac{\cramped{a^2 + b^2}}{a^2 + b^2}
  \frac{a^2 + b^2}{\cramped{a^2 + b^2}}
}
a^{
  a^{
    \frac{a^2 + b^2}{a^2 + b^2}
    \frac{\cramped{a^2 + b^2}}{a^2 + b^2}
    \frac{a^2 + b^2}{\cramped{a^2 + b^2}}
  }
}
\end{document}

```

$$\frac{a^2 + b^2}{a^2 + b^2} \frac{a^2 + b^2}{a^2 + b^2} \frac{a^2 + b^2}{a^2 + b^2}$$

3.9 Test L602b

```
\input{umtest-preamble}

\usepackage{unicode-math}

\setmathfont{xits-math.otf}

\ExplSyntaxOn

\NewDocumentCommand \mathstylename { } {
  \mathtt {
    \prg_case_int:nnn { \luatexmathstyle } {
      { \displaystyle } { \token_to_str:N \displaystyle }
      { \luatexcrampeddisplaystyle } { \token_to_str:N \crampeddisplaystyle }
      { \textstyle } { \token_to_str:N \textstyle }
      { \luatexcrampedtextstyle } { \token_to_str:N \crampedtextstyle }
      { \scriptstyle } { \token_to_str:N \scriptstyle }
      { \luatexcrampedscriptstyle } { \token_to_str:N \crampedscriptstyle }
      { \scriptscriptstyle } { \token_to_str:N \scriptscriptstyle }
      { \luatexcrampedscriptscriptstyle } { \token_to_str:N \crampedscriptscriptstyle }
    } {
      outside math
    }
  }
}

\ExplSyntaxOff

\begin{document}


$$\frac{\mathstylename}{\mathstylename}$$



$$\frac{\mathstylename}{\mathstylename}$$



$$\frac{\mathstylename}{\mathstylename}$$


\end{document}
```

`\input{umtest-preamble}`

$$\backslash\mathrm{setmathfont}\{\mathrm{xits-math.otf}\}$$

```
\NewDocumentCommand \mathstylename { } {
```

[illegible]

```
\begin{document}
```

 $\frac{\text{mathstylename}}{\text{mathstylename}}$
$$\frac{\mathcal{A}}{\mathcal{B}}$$
 $\binom{\mathit{style}}{\mathit{style}}$

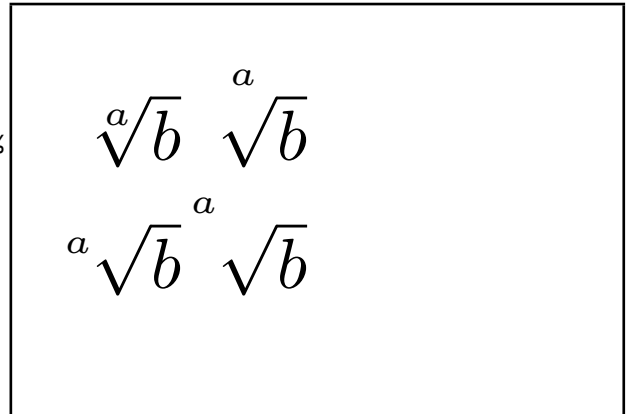
\end{document}

\end{document}

3.11 Test L604a

```
\input{umtest-preamble}
\usepackage{amsmath}
\usepackage{graphicx}
\newcommand*{\test}[1]{%
  \parbox[b][50pt][50pt]{\scalebox{3}{\$#1\$}}%
}
\begin{document}
\test{\sqrt[a]{b}}
\test{\sqrt[\uproot{10}a]{b}}

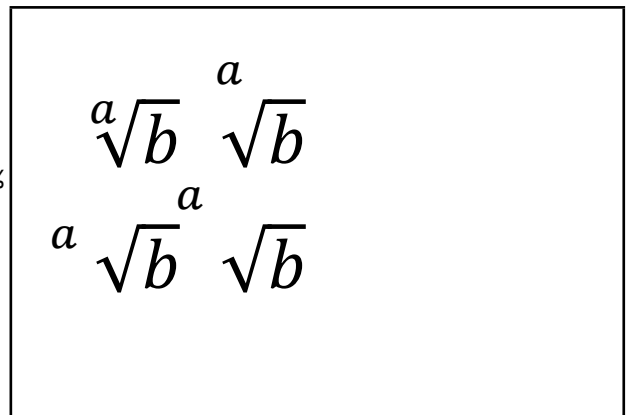
\test{\sqrt[\leftroot{10}a]{b}}
\test{\sqrt[\leftroot{10}\uproot{10}a]{b}}
\end{document}
```



3.12 Test L604b

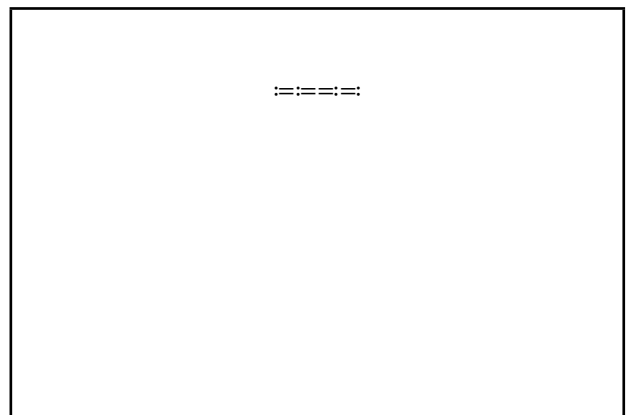
```
\input{umtest-preamble}
\usepackage{unicode-math}
\usepackage{amsmath}
\usepackage{graphicx}
\setmathfont{Cambria Math}
\newcommand*{\test}[1]{%
  \parbox[b][50pt][50pt]{\scalebox{3}{\$#1\$}}%
}
\begin{document}
\test{\sqrt[a]{b}}
\test{\sqrt[\uproot{10}a]{b}}

\test{\sqrt[\leftroot{10}a]{b}}
\test{\sqrt[\leftroot{10}\uproot{10}a]{b}}
\end{document}
```



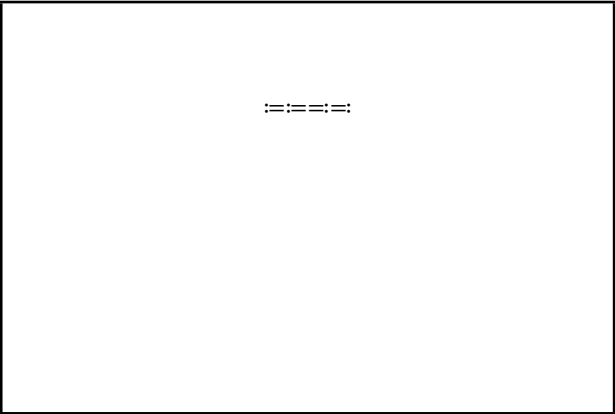
3.13 Test L650a

```
\input{umtest-preamble}
\usepackage{unicode-math}
\usepackage{mathtools}
\setmathfont{Cambria Math}
\begin{document}
\[
\coloneq
\coloneqq
\eqcolon
\eqqcolon
\]
\end{document}
```



3.14 Test L650b

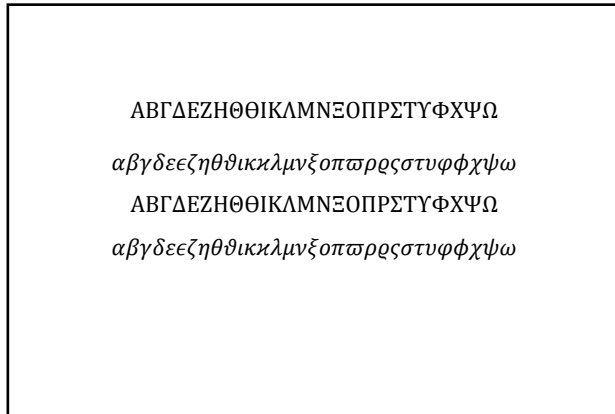
```
\input{umtest-preamble}
\usepackage{unicode-math}
\usepackage{colonequals}
\setmathfont{Cambria Math}
\begin{document}
\[
\coloneq
\colonequals
\eqcolon
\equalscolon
\]
\end{document}
```



4 X_YL^AT_EX test files

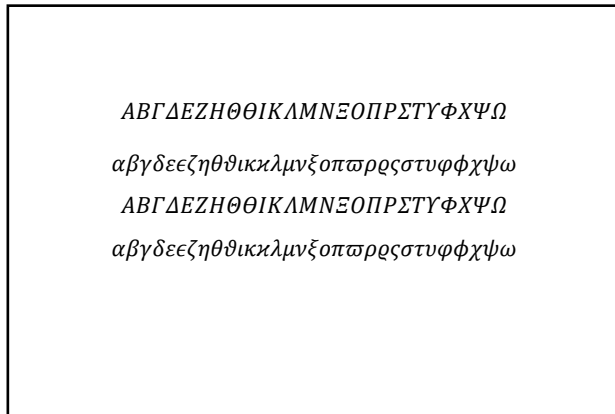
4.1 Test X002a

```
\input{umtest-preamble}
\usepackage[math-style=TeX]{unicode-math}
\setmathfont{Cambria Math}
\begin{document}
\[\GREEKtext\]
\[\greektext\]
\[\GREEKmath\]
\[\greekmath\]
\end{document}
```



4.2 Test X002b

```
\input{umtest-preamble}
\usepackage[math-style=ISO]{unicode-math}
\setmathfont{Cambria Math}
\begin{document}
\[\GREEKtext\]
\[\greektext\]
\[\GREEKmath\]
\[\greekmath\]
\end{document}
```



4.3 Test X002c

```
\input{umtest-preamble}  
\usepackage[math-style=literal]{unicode-math}  
\setmathfont{Cambria Math}  
\begin{document}  
\[\GREEKtext\  
\[\greektext\  
\[\GREEKmath\  
\[\greekmath\  
\end{document}
```

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4.4 Test X002d

```
\input{umtest-preamble}  
\usepackage[math-style=french]{unicode-math}  
\setmathfont{Cambria Math}  
\begin{document}  
\[\GREEKtext\  
\[\greektext\  
\[\GREEKmath\  
\[\greekmath\  
\end{document}
```

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4.5 Test X002e

```
\input{umtest-preamble}  
\usepackage[math-style=upright]{unicode-math}  
\setmathfont{Cambria Math}  
\begin{document}  
\[\GREEKtext\  
\[\greektext\  
\[\GREEKmath\  
\[\greekmath\  
\end{document}
```

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αβγδεεζηθθικλμνξοπωρρςστυφφχψω

4.6 Test X003a

```
\input{umtest-preamble}  
\usepackage[bold-style=TeX]{unicode-math}  
\setmathfont{Cambria Math}  
\begin{document}  
\[\mathbf{A}\]  
\[\mathbf{B}\]  
\[\mathbf{a}\]  
\[\mathbf{b}\]  
\[\mathbf{0}\]  
\end{document}
```

ABCDEFGHIJKLMNOPQRSTUVWXYZ
ABCDEFGHIJKLMNOPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz
abcdefghijklmnopqrstuvwxyz
0123456789

4.7 Test X003b

```
\input{umtest-preamble}  
\usepackage[bold-style=TeX]{unicode-math}  
\setmathfont{Cambria Math}  
\begin{document}  
\[\mathbf{A}\]  
\[\mathbf{B}\]  
\[\mathbf{a}\]  
\[\mathbf{b}\]  
\end{document}
```

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αβγδεζηθικλμνξοπρρςστυφφχψω

4.8 Test X003c

```
\input{umtest-preamble}  
\usepackage[bold-style=TeX]{unicode-math}  
\setmathfont{Cambria Math}  
\begin{document}  
\[\mathbf{A}\]  
\[\mathbf{B}\]  
\[\mathbf{a}\]  
\[\mathbf{b}\]  
\[\mathbf{0}\]  
\end{document}
```

ABCDEFGHIJKLMNOPQRSTUVWXYZ
ABCDEFGHIJKLMNOPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz
abcdefghijklmnopqrstuvwxyz
0123456789

4.9 Test X003d

```
\input{umtest-preamble}
\usepackage[bold-style=TeX]{unicode-math}
\setmathfont{Cambria Math}
\begin{document}
\[\mathbf{\GREEKmath\}]
\[\mathbf{\GREEKtext\}]
\[\mathbf{\greekmath\}]
\[\mathbf{\greektext\}]
\end{document}
```

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αβγδεεζηθθικκλμνξοπωρρςστυφφχψω

4.10 Test X003e

```
\input{umtest-preamble}
\usepackage[bold-style=ISO]{unicode-math}
\setmathfont{Cambria Math}
\begin{document}
\[\LATINmathbfup\]
\[\LATINmathbfit\]
\[\latinmathbfup\]
\[\latinmathbfit\]
\[\numbersmathbfup\]
\end{document}
```

ABCDEFGHIJKLMNOPQRSTUVWXYZ
ABCDEFGHIJKLMNOPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz
abcdefghijklmnopqrstuvwxyz
0123456789

4.11 Test X003f

```
\input{umtest-preamble}
\usepackage[bold-style=ISO]{unicode-math}
\setmathfont{Cambria Math}
\begin{document}
\[\GREEKmathbfup\]
\[\GREEKmathbfit\]
\[\greekmathbfup\]
\[\greekmathbfit\]
\end{document}
```

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4.12 Test X003g

```
\input{umtest-preamble}  
\usepackage[bold-style=ISO]{unicode-math}  
\setmathfont{Cambria Math}  
\begin{document}  
\[\mathbf{LATINmath}\]  
\[\mathbf{LATINtext}\]  
\[\mathbf{latinmath}\]  
\[\mathbf{latintext}\]  
\[\mathbf{0123456789}\]  
\end{document}
```

ABCDEFGHIJKLMNOPQRSTUVWXYZ
ABCDEFGHIJKLMNOPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxy
abcdefghijklmnopqrstuvwxy
0123456789

4.13 Test X003h

```
\input{umtest-preamble}  
\usepackage[bold-style=ISO]{unicode-math}  
\setmathfont{Cambria Math}  
\begin{document}  
\[\mathbf{GREEKmath}\]  
\[\mathbf{GREEKtext}\]  
\[\mathbf{greekmath}\]  
\[\mathbf{greektext}\]  
\end{document}
```

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4.14 Test X003i

```
\input{umtest-preamble}  
\usepackage[bold-style=upright]{unicode-math}  
\setmathfont{Cambria Math}  
\begin{document}  
\[\LATINmathbfup\]  
\[\LATINmathbfup\]  
\[\latinmathbfup\]  
\[\latinmathbfup\]  
\[\numbersmathbfup\]  
\end{document}
```

ABCDEFGHIJKLMNOPQRSTUVWXYZ
ABCDEFGHIJKLMNOPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxy
abcdefghijklmnopqrstuvwxy
0123456789

4.15 Test X003j

```
\input{umtest-preamble}  
\usepackage[bold-style=upright]{unicode-math}  
\setmathfont{Cambria Math}  
\begin{document}  
\[\GREEKmathbfup\  
\[\GREEKmathbfit\  
\[\greekmathbfup\  
\[\greekmathbfit\  
\end{document}
```

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4.16 Test X003k

```
\input{umtest-preamble}  
\usepackage[bold-style=upright]{unicode-math}  
\setmathfont{Cambria Math}  
\begin{document}  
\[\mathbf\{LATINmath\  
\[\mathbf\{LATINtext\  
\[\mathbf\{latinmath\  
\[\mathbf\{latinintext\  
\[\mathbf\{0123456789\  
\end{document}
```

ΑΒΓΔΕΖΗΘΙΚΛΜΝΟΠΡΣΤΥΦΧΨΩ
ΑΒΓΔΕΖΗΘΙΚΛΜΝΟΠΡΣΤΥΦΧΨΩ
αβcdefghijklmnopqrstuvwxy
αβcdefghijklmnopqrstuvwxy
0123456789

4.17 Test X003l

```
\input{umtest-preamble}  
\usepackage[bold-style=upright]{unicode-math}  
\setmathfont{Cambria Math}  
\begin{document}  
\[\mathbf\{GREEKmath\  
\[\mathbf\{GREEKtext\  
\[\mathbf\{greekmath\  
\[\mathbf\{greektext\  
\end{document}
```

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4.18 Test X003m

```
\input{umtest-preamble}  
\usepackage[bold-style=literal]{unicode-math}  
\setmathfont{Cambria Math}  
\begin{document}  
\[\mathbf{A}\]  
\[\mathbf{B}\]  
\[\mathbf{a}\]  
\[\mathbf{b}\]  
\[\mathbf{0}\]  
\end{document}
```

ABCDEFGHIJKLMNOPQRSTUVWXYZ
ABCDEFGHIJKLMNOPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxy
abcdefghijklmnopqrstuvwxy
0123456789

4.19 Test X003n

```
\input{umtest-preamble}  
\usepackage[bold-style=literal]{unicode-math}  
\setmathfont{Cambria Math}  
\begin{document}  
\[\mathbf{A}\]  
\[\mathbf{B}\]  
\[\mathbf{a}\]  
\[\mathbf{b}\]  
\end{document}
```

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4.20 Test X003o

```
\input{umtest-preamble}  
\usepackage[bold-style=literal]{unicode-math}  
\setmathfont{Cambria Math}  
\begin{document}  
\[\mathbf{A}\]  
\[\mathbf{B}\]  
\[\mathbf{a}\]  
\[\mathbf{b}\]  
\end{document}
```

ABCDEFGHIJKLMNOPQRSTUVWXYZ
ABCDEFGHIJKLMNOPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxy
abcdefghijklmnopqrstuvwxy
0123456789

4.21 Test X003p

```
\input{umtest-preamble}  
\usepackage[bold-style=literal]{unicode-math}  
\setmathfont{Cambria Math}  
\begin{document}  
\[\mathbf{\GREEKmath\}]  
\[\mathbf{\GREEKtext\}]  
\[\mathbf{\greekmath\}]  
\[\mathbf{\greektext\}]  
\end{document}
```

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4.22 Test X004a

```
\input{umtest-preamble}  
\usepackage[sans-style=upright]{unicode-math}  
\setmathfont{Cambria Math}  
\begin{document}  
\[\LATINmathsfup\]  
\[\LATINmathsfitt\]  
\[\latinmathsfup\]  
\[\latinmathsfitt\]  
\[\numbersmathsfup\]  
\end{document}
```

ABCDEFGHIJKLMNOPQRSTUVWXYZ
ABCDEFGHIJKLMNOPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz
abcdefghijklmnopqrstuvwxyz
0123456789

4.23 Test X004b

```
\input{umtest-preamble}  
\usepackage[sans-style=upright]{unicode-math}  
\setmathfont{Cambria Math}  
\begin{document}  
\[\mathsf{\LATINtext}\]  
\[\mathsf{\LATINmath}\]  
\[\mathsf{\latinintext}\]  
\[\mathsf{\latinmath}\]  
\[\mathsf{0123456789}\]  
\end{document}
```

ABCDEFGHIJKLMNOPQRSTUVWXYZ
ABCDEFGHIJKLMNOPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz
abcdefghijklmnopqrstuvwxyz
0123456789

4.24 Test X004c

```
\input{umtest-preamble}  
\usepackage[sans-style=italic]{unicode-math}  
\setmathfont{Cambria Math}  
\begin{document}  
\[\LATINmathsfup\  
\[\LATINmathsfit\  
\[\latinmathsfup\  
\[\latinmathsfit\  
\[\numbersmathsfup\  
\end{document}
```

ABCDEFGHIJKLMNOPQRSTUVWXYZ
ABCDEFGHIJKLMNOPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz
abcdefghijklmnopqrstuvwxyz
0123456789

4.25 Test X004d

```
\input{umtest-preamble}  
\usepackage[sans-style=italic]{unicode-math}  
\setmathfont{Cambria Math}  
\begin{document}  
\[\mathsf{\LATINtext}\]  
\[\mathsf{\LATINmath}\]  
\[\mathsf{\latintext}\]  
\[\mathsf{\latinmath}\]  
\[\mathsf{0123456789}\]  
\end{document}
```

ABCDEFGHIJKLMNOPQRSTUVWXYZ
ABCDEFGHIJKLMNOPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz
abcdefghijklmnopqrstuvwxyz
0123456789

4.26 Test X004e

```
\input{umtest-preamble}  
\usepackage[sans-style=literal]{unicode-math}  
\setmathfont{Cambria Math}  
\begin{document}  
\[\LATINmathsfup\  
\[\LATINmathsfit\  
\[\latinmathsfup\  
\[\latinmathsfit\  
\[\numbersmathsfup\  
\end{document}
```

ABCDEFGHIJKLMNOPQRSTUVWXYZ
ABCDEFGHIJKLMNOPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz
abcdefghijklmnopqrstuvwxyz
0123456789

4.27 Test X004f

```
\input{umtest-preamble}
\usepackage[sans-style=literal]{unicode-math}
\setmathfont{Cambria Math}
\begin{document}
\[\mathsf{\backslash LATINtext}\]
\[\mathsf{\backslash LATINmath}\]
\[\mathsf{\backslash latintext}\]
\[\mathsf{\backslash latinmath}\]
\[\mathsf{0123456789}\]
\end{document}
```

ABCDEFGHIJKLMNOPQRSTUVWXYZ
ABCDEFGHIJKLMNOPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz
abcdefghijklmnopqrstuvwxyz
0123456789

4.28 Test X005a

```
\input{umtest-preamble}
\usepackage[sans-style=upright]{unicode-math}
\setmathfont{Code2001}
\begin{document}
\[\backslash LATINmathbbsfup\]
\[\backslash LATINmathbbsffit\]
\[\backslash latinmathbbsfup\]
\[\backslash latinmathbbsffit\]
\[\backslash numbersmathbbsfup\]
\end{document}
```

ABCDEFGHIJKLMNOPQRSTUVWXYZ
ABCDEFGHIJKLMNOPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz
abcdefghijklmnopqrstuvwxyz
0123456789

4.29 Test X005b

```
\input{umtest-preamble}
\usepackage[sans-style=upright]{unicode-math}
\setmathfont{Code2001}
\begin{document}
\[\backslash GREEKmathbbsfup\]
\[\backslash GREEKmathbbsffit\]
\[\backslash greekmathbbsfup\]
\[\backslash greekmathbbsffit\]
\end{document}
```

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αβγδεεζηθθικκλμνξοπαρρρςστυφθχψω

4.30 Test X005c

```
\input{umtest-preamble}  
\usepackage[sans-style=upright]{unicode-math}  
\setmathfont{Code2001}  
\begin{document}  
\[\mathbfsf\LATINmath\  
\[\mathbfsf\LATINtext\  
\[\mathbfsf\latinmath\  
\[\mathbfsf\latintext\  
\[\mathbfsf{0123456789}\]  
\end{document}
```

ABCDEFGHIJKLMNOPQRSTUVWXYZ
ABCDEFGHIJKLMNOPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz
abcdefghijklmnopqrstuvwxyz
0123456789

4.31 Test X005d

```
\input{umtest-preamble}  
\usepackage[sans-style=upright]{unicode-math}  
\setmathfont{Code2001}  
\begin{document}  
\[\mathbfsf\GREEKmath\  
\[\mathbfsf\GREEKtext\  
\[\mathbfsf\greekmath\  
\[\mathbfsf\greektext\  
\end{document}
```

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4.32 Test X005e

```
\input{umtest-preamble}  
\usepackage[sans-style=italic]{unicode-math}  
\setmathfont{Code2001}  
\begin{document}  
\[\LATINmathbfsfup\  
\[\LATINmathbfsfit\  
\[\latinmathbfsfup\  
\[\latinmathbfsfit\  
\[\numbersmathbfsfup\  
\end{document}
```

ABCDEFGHIJKLMNOPQRSTUVWXYZ
ABCDEFGHIJKLMNOPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz
abcdefghijklmnopqrstuvwxyz
0123456789

4.33 Test X005f

```
\input{umtest-preamble}  
\usepackage[sans-style=italic]{unicode-math}  
\setmathfont{Code2001}  
\begin{document}  
\[\GREEKmathbfsfup\  
\[\GREEKmathbfsfit\  
\[\greekmathbfsfup\  
\[\greekmathbfsfit\  
\end{document}
```

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4.34 Test X005g

```
\input{umtest-preamble}  
\usepackage[sans-style=italic]{unicode-math}  
\setmathfont{Code2001}  
\begin{document}  
\[\mathbfsf\LATINmath\  
\[\mathbfsf\LATINtext\  
\[\mathbfsf\latinmath\  
\[\mathbfsf\latintext\  
\[\mathbfsf{0123456789}\]  
\end{document}
```

ABCDEFGHIJKLMNOPQRSTUVWXYZ
ABCDEFGHIJKLMNOPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz
abcdefghijklmnopqrstuvwxyz
0123456789

4.35 Test X005h

```
\input{umtest-preamble}  
\usepackage[sans-style=italic]{unicode-math}  
\setmathfont{Code2001}  
\begin{document}  
\[\mathbfsf\GREEKmath\  
\[\mathbfsf\GREEKtext\  
\[\mathbfsf\greekmath\  
\[\mathbfsf\greektext\  
\end{document}
```

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αβγδεεζηθθικιμνξοπαρρςστυφφχψω

4.36 Test X005i

```
\input{umtest-preamble}  
\usepackage[sans-style=literal]{unicode-math}  
\setmathfont{Code2001}  
\begin{document}  
\[ \mathbf{fup} \]  
\[ \mathbf{fit} \]  
\[ \mathbf{fup} \]  
\[ \mathbf{fit} \]  
\[ \mathbf{fup} \]  
\[ \mathbf{fit} \]  
\end{document}
```

ABCDEFGHIJKLMNOPQRSTUVWXYZ
ABCDEFGHIJKLMNOPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz
abcdefghijklmnopqrstuvwxyz
0123456789

4.37 Test X005j

```
\input{umtest-preamble}  
\usepackage[sans-style=literal]{unicode-math}  
\setmathfont{Code2001}  
\begin{document}  
\[ \mathbf{fup} \]  
\[ \mathbf{fit} \]  
\[ \mathbf{fup} \]  
\[ \mathbf{fit} \]  
\end{document}
```

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4.38 Test X005k

```
\input{umtest-preamble}  
\usepackage[sans-style=literal]{unicode-math}  
\setmathfont{Code2001}  
\begin{document}  
\[ \mathbf{fup} \]  
\[ \mathbf{fit} \]  
\[ \mathbf{fup} \]  
\[ \mathbf{fit} \]  
\[ \mathbf{fup} \]  
\[ \mathbf{fit} \]  
\end{document}
```

ABCDEFGHIJKLMNOPQRSTUVWXYZ
ABCDEFGHIJKLMNOPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz
abcdefghijklmnopqrstuvwxyz
0123456789

4.39 Test X005l

```
\input{umtest-preamble}  
\usepackage[sans-style=literal]{unicode-math}  
\setmathfont{Code2001}  
\begin{document}  
\[\mathbfsf\GREEKmath\  
\[\mathbfsf\GREEKtext\  
\[\mathbfsf\greekmath\  
\[\mathbfsf\greektext\  
\end{document}
```

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4.40 Test X010a

```
\input{umtest-preamble}  
\usepackage{unicode-math}  
\setmathfont{Cambria Math}  
\begin{document}  
\[\mathscr{LATINtext}\]  
\[\mathscr{latintext}\]  
\[\mathscr{LATInmath}\]  
\[\mathscr{latinmath}\]  
\end{document}
```

ΑΒCDEFGHIJJKLMNOPQRSTUvwxyz
αbcdefghijklmnopqrstuvwxyz
ΑΒCDEFGHIJJKLMNOPQRSTUvwxyz
αbcdefghijklmnopqrstuvwxyz

4.41 Test X010b

```
\input{umtest-preamble}  
\usepackage{unicode-math}  
\setmathfont{Cambria Math}  
\begin{document}  
\[\LATInmathscr\  
\[\latinmathscr\  
\[\reservedmathscr\  
\end{document}
```

ΑΒCDEFGHIJJKLMNOPQRSTUvwxyz
αbcdefghijklmnopqrstuvwxyz
ⱭⱮⱯⱰⱱⱲⱳⱴⱵⱶⱷⱸⱹⱺⱻⱼⱽⱾⱿ

4.42 Test X010c

```
\input{umtest-preamble}  
\usepackage{unicode-math}  
\setmathfont{Cambria Math}  
\begin{document}  
\[\mathfrak{\LATINtext}\]  
\[\mathfrak{\latintext}\]  
\[\mathfrak{\LATINmath}\]  
\[\mathfrak{\latinmath}\]  
\end{document}
```

ABCDEFGHIJKLMNOPQRSTUVWXYZ

abcdefghijklmnopqrstuvwxyz

ABCDEFGHIJKLMNOPQRSTUVWXYZ

abcdefghijklmnopqrstuvwxyz

4.43 Test X010d

```
\input{umtest-preamble}  
\usepackage{unicode-math}  
\setmathfont{Cambria Math}  
\begin{document}  
\[\LATINmathfrak{\}]  
\[\latinmathfrak{\}]  
\[\reservedmathfrak{\}]  
\end{document}
```

ABCDEFGHIJKLMNOPQRSTUVWXYZ

abcdefghijklmnopqrstuvwxyz

????

4.44 Test X011a

```
\input{umtest-preamble}  
\usepackage{unicode-math}  
\setmathfont{Cambria Math}  
\begin{document}  
\[\mathup{\LATINtext}\]  
\[\mathup{\latintext}\]  
\[\mathup{\LATINmath}\]  
\[\mathup{\latinmath}\]  
\end{document}
```

ABCDEFGHIJKLMNOPQRSTUVWXYZ

abcdefghijklmnopqrstuvwxyz

ABCDEFGHIJKLMNOPQRSTUVWXYZ

abcdefghijklmnopqrstuvwxyz

4.45 Test X011b

```
\input{umtest-preamble}  
\usepackage{unicode-math}  
\setmathfont{Cambria Math}  
\begin{document}  
\[\mathup{\GREEKtext}\]  
\[\mathup{\greektext}\]  
\[\mathup{\GREEKmath}\]  
\[\mathup{\greekmath}\]  
\end{document}
```

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4.46 Test X012a

```
\input{umtest-preamble}  
\usepackage{unicode-math}  
\setmathfont{Cambria Math}  
\begin{document}  
\[\mathit{\LATINtext}\]  
\[\mathit{\latintext}\]  
\[\mathit{\LATINmath}\]  
\[\mathit{\latinmath}\]  
\end{document}
```

ABCDEFGHIJKLMNOPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz
ABCDEFGHIJKLMNOPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz

4.47 Test X012b

```
\input{umtest-preamble}  
\usepackage{unicode-math}  
\setmathfont{Cambria Math}  
\begin{document}  
\[\mathit{\GREEKtext}\]  
\[\mathit{\greektext}\]  
\[\mathit{\GREEKmath}\]  
\[\mathit{\greekmath}\]  
\end{document}
```

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4.48 Test X013a

```
\input{umtest-preamble}  
\usepackage{unicode-math}  
\setmathfont{Cambria Math}  
\begin{document}  
\[\mathbb{\text{LATINtext}}\]  
\[\mathbb{\text{latinintext}}\]  
\[\mathbb{\text{LATINmath}}\]  
\[\mathbb{\text{latinmath}}\]  
\end{document}
```

ABCDEFGHIJKLMNOPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz
ABCDEFGHIJKLMNOPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz

4.49 Test X013b

```
\input{umtest-preamble}  
\usepackage{unicode-math}  
\setmathfont{Cambria Math}  
\begin{document}  
\[\mathbb{0123456789}\]  
\[\numbersmathbb{\}]  
\end{document}
```

0123456789
0123456789

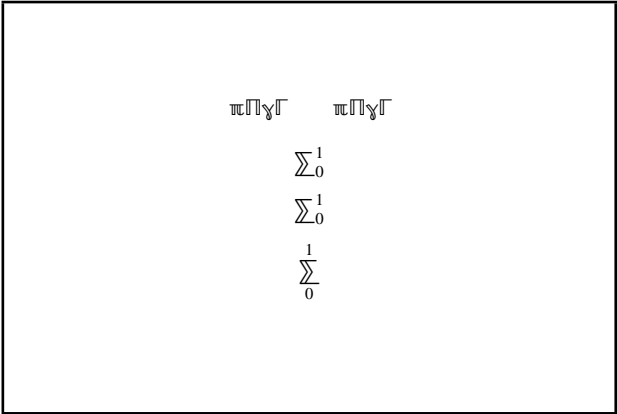
4.50 Test X013c

```
\input{umtest-preamble}  
\usepackage{unicode-math}  
\setmathfont{Cambria Math}  
\begin{document}  
\[\text{LATINmathbb}\]  
\[\text{latinmathbb}\]  
\[\reservedmathbb\]  
\end{document}
```

ABCDEFGHIJKLMNOPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz
???????

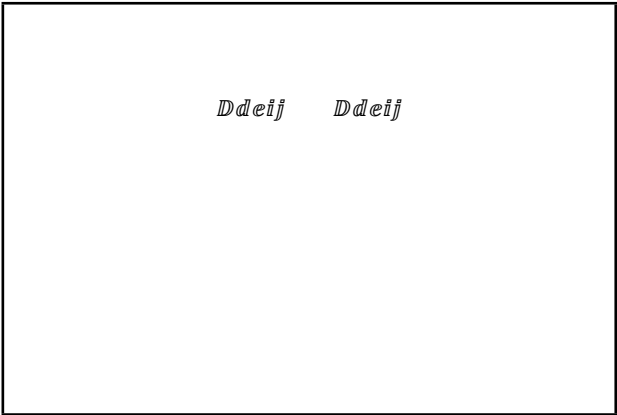
4.51 Test X013d

```
\input{umtest-preamble}
\usepackage{unicode-math}
\setmathfont{STIXGeneral}
\begin{document}
\[\mathbb{\pi\Gamma}\quad\mathbb{\sum}\quad\]
\[\mathbb{\sum}_0\quad\]
\[\mathbb{\sum}_0\quad\]
\[\mathbb{\sum}_0\quad\]
\end{document}
```



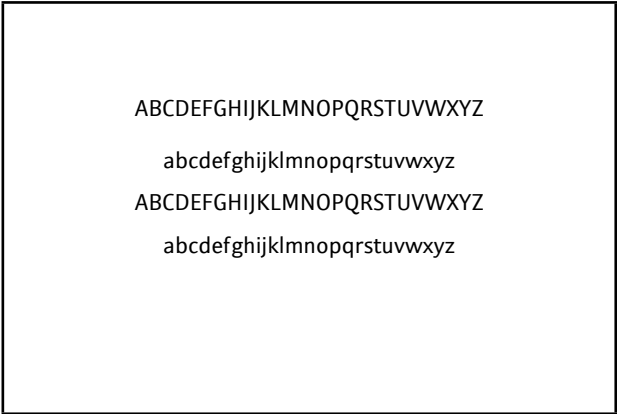
4.52 Test X013e

```
\input{umtest-preamble}
\usepackage{unicode-math}
\setmathfont{Cambria Math}
\begin{document}
\[\mathbb{Ddei}\quad\mathbb{Ddei}\quad\]
\end{document}
```



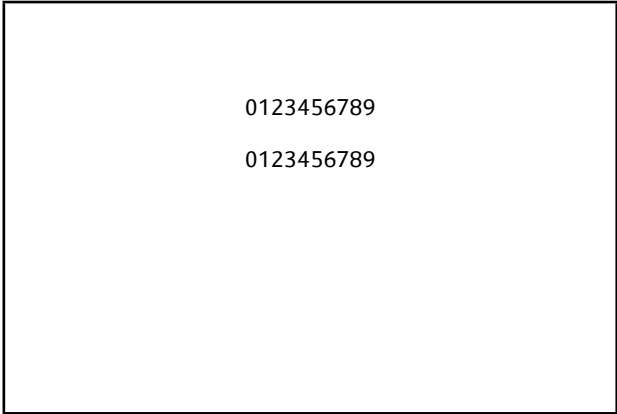
4.53 Test X014a

```
\input{umtest-preamble}
\usepackage{unicode-math}
\setmathfont{Cambria Math}
\begin{document}
\[\mathsf{ABCDEFGHIJKLMNOPQRSTUVWXYZ}\quad\]
\[\mathsf{abcdefghijklmnopqrstuvwxyz}\quad\]
\[\mathsf{ABCDEFGHIJKLMNOPQRSTUVWXYZ}\quad\]
\[\mathsf{abcdefghijklmnopqrstuvwxyz}\quad\]
\end{document}
```



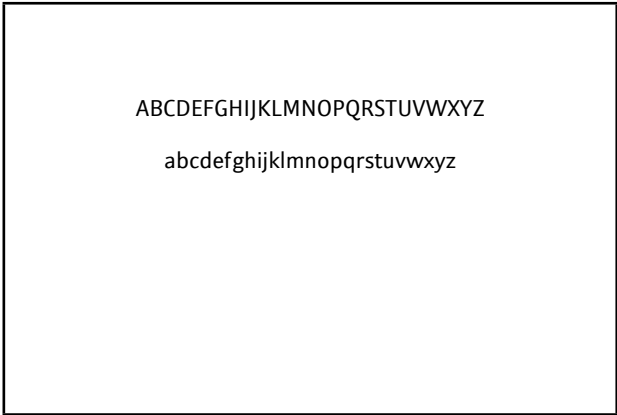
4.54 Test X014b

```
\input{umtest-preamble}  
\usepackage{unicode-math}  
\setmathfont{Cambria Math}  
\begin{document}  
\[\mathsfup{0123456789}\]  
\[\numbersmathsfup\]  
\end{document}
```



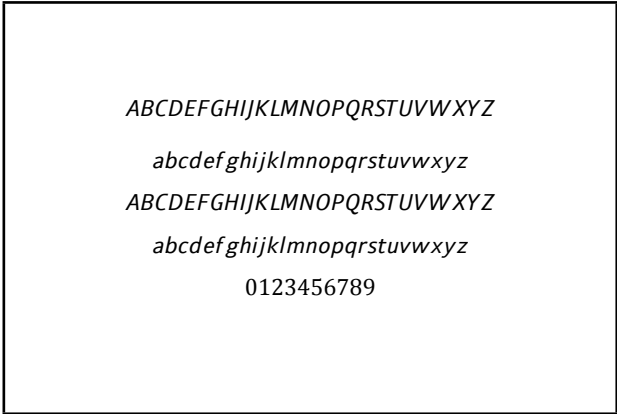
4.55 Test X014c

```
\input{umtest-preamble}  
\usepackage{unicode-math}  
\setmathfont{Cambria Math}  
\begin{document}  
\[\LATINmathsfup\]  
\[\latinmathsfup\]  
\end{document}
```



4.56 Test X015a

```
\input{umtest-preamble}  
\usepackage{unicode-math}  
\setmathfont{Cambria Math}  
\begin{document}  
\[\mathsfit{LATINtext}\]  
\[\mathsfit{latintext}\]  
\[\mathsfit{LATINmath}\]  
\[\mathsfit{latinmath}\]  
\[\mathsfit{0123456789}\]  
\end{document}
```



4.57 Test X015b

```
\input{umtest-preamble}
\usepackage{unicode-math}
\setmathfont{Cambria Math}
\begin{document}
\[\backslash\mathrm{LATINmathsf}\backslash]
\[\backslash\mathrm{latinmathsf}\backslash]
\end{document}
```

ABCDEFGHIJKLMNOPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz

4.58 Test X016a

```
\input{umtest-preamble}
\usepackage{unicode-math}
\setmathfont{Asana-Math.otf}
\begin{document}

$$\text{\LaTeX}$$


$$\text{\LaTeX}$$


$$\text{\LaTeX}$$


$$\text{\LaTeX}$$

\end{document}
```

ABCDEFGHIJKLMNOPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz
ABCDEFGHIJKLMNOPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz

4.59 Test X016b

```
\input{umtest-preamble}
\usepackage{unicode-math}
\setmathfont{Asana-Math.otf}
\begin{document}
 $\mathbb{0123456789}$ 
 $\mathbb{0123456789}$ 
\end{document}
```

0123456789

0123456789

4.60 Test X016c

```
\input{umtest-preamble}  
\usepackage{unicode-math}  
\setmathfont{Asana-Math.otf}  
\begin{document}  
\[ \mathrm{ABCDEFGHIJKLMNOPQRSTUVWXYZ}  
\[ \mathrm{abcdefghijklmnopqrstuvwxyz}  
\end{document}
```

ABCDEFGHIJKLMNOPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz

4.61 Test X017a

```
\input{umtest-preamble}  
\usepackage{unicode-math}  
\setmathfont{Cambria Math}  
\begin{document}  
\[ \mathbf{ABCDEFGHIJKLMNOPQRSTUVWXYZ}  
\[ \mathbf{abcdefghijklmnopqrstuvwxyz}  
\[ \mathbf{ABCDEFGHIJKLMNOPQRSTUVWXYZ}  
\[ \mathbf{abcdefghijklmnopqrstuvwxyz}  
\end{document}
```

ABCDEFGHIJKLMNOPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz
ABCDEFGHIJKLMNOPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz

4.62 Test X017b

```
\input{umtest-preamble}  
\usepackage{unicode-math}  
\setmathfont{Cambria Math}  
\begin{document}  
\[ \mathrm{ABCDEFGHIJKLMNOPQRSTUVWXYZ}  
\[ \mathrm{abcdefghijklmnopqrstuvwxyz}  
\end{document}
```

ABCDEFGHIJKLMNOPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz

4.63 Test X017c

```
\input{umtest-preamble}  
\usepackage{unicode-math}  
\setmathfont{Cambria Math}  
\begin{document}  
\[\mathbf{\frac{\text{LATINtext}}{\text{LATINtext}}}\]  
\[\mathbf{\frac{\text{LATINtext}}{\text{LATINtext}}}\]  
\[\mathbf{\frac{\text{LATINmath}}{\text{LATINmath}}}\]  
\[\mathbf{\frac{\text{LATINmath}}{\text{LATINmath}}}\]  
\end{document}
```

ABCDEFGHIJKLMNOPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz
ABCDEFGHIJKLMNOPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz

4.64 Test X017d

```
\input{umtest-preamble}  
\usepackage{unicode-math}  
\setmathfont{Cambria Math}  
\begin{document}  
\[\mathbf{\frac{\text{LATINmath}}{\text{LATINmath}}}\]  
\[\mathbf{\frac{\text{LATINmath}}{\text{LATINmath}}}\]  
\end{document}
```

ABCDEFGHIJKLMNOPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz

4.65 Test X018a

```
\input{umtest-preamble}  
\usepackage{unicode-math}  
\setmathfont{Cambria Math}  
\begin{document}  
\[\mathbf{\uparrow\text{LATINtext}}\]  
\[\mathbf{\uparrow\text{LATINtext}}\]  
\[\mathbf{\uparrow\text{LATINmath}}\]  
\[\mathbf{\uparrow\text{LATINmath}}\]  
\[\mathbf{\uparrow0123456789}\]  
\end{document}
```

ABCDEFGHIJKLMNOPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz
ABCDEFGHIJKLMNOPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz
0123456789

4.66 Test X018b

```
\input{umtest-preamble}
\usepackage{unicode-math}
\setmathfont{Cambria Math}
\begin{document}
\[\mathbfup{\GREEKtext}\]
\[\mathbfup{\greektext}\]
\[\mathbfup{\GREEKmath}\]
\[\mathbfup{\greekmath}\]
\end{document}
```

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4.67 Test X019a

```
\input{umtest-preamble}
\usepackage{unicode-math}
\setmathfont{Cambria Math}
\begin{document}
\[\mathbfit{\LATINtext}\]
\[\mathbfit{\latintext}\]
\[\mathbfit{\LATINmath}\]
\[\mathbfit{\latinmath}\]
\[\mathbfit{0123456789}\]
\end{document}
```

ABCDEFGHIJKLMNOPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz
ABCDEFGHIJKLMNOPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz
0123456789

4.68 Test X019b

```
\input{umtest-preamble}
\usepackage{unicode-math}
\setmathfont{Cambria Math}
\begin{document}
\[\mathbfit{\GREEKtext}\]
\[\mathbfit{\greektext}\]
\[\mathbfit{\GREEKmath}\]
\[\mathbfit{\greekmath}\]
\end{document}
```

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4.69 Test X020a

```
\input{umtest-preamble}
\usepackage{unicode-math}
\setmathfont{Cambria Math}
\begin{document}
\[\mathbfsfit{\LATINText}\]
\[\mathbfsfit{\latintext}\]
\[\mathbfsfit{\LATINmath}\]
\[\mathbfsfit{\latinmath}\]
\[\mathbfsfit{0123456789}\]
\end{document}
```

ABCDEFGHIJKLMNOPQRSTUVWXYZ

abcdefghijklmnopqrstuvwxy

ABCDEFGHIJKLMNOPQRSTUVWXYZ

abcdefghijklmnopqrstuvwxy

0123456789

4.70 Test X020b

```
\input{umtest-preamble}
\usepackage{unicode-math}
\setmathfont{STIXGeneral-Bold}
\begin{document}
\[\mathbfsfup{\GREEKtext}\]
\[\mathbfsfup{\greektext}\]
\[\mathbfsfup{\GREEKmath}\]
\[\mathbfsfup{\greekmath}\]
\end{document}
```

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4.71 Test X021a

```
\input{umtest-preamble}
\usepackage{unicode-math}
\setmathfont{Cambria Math}
\begin{document}
\[\mathbfsfit{\LATINText}\]
\[\mathbfsfit{\latintext}\]
\[\mathbfsfit{\LATINmath}\]
\[\mathbfsfit{\latinmath}\]
\[\mathbfsfit{0123456789}\]
\end{document}
```

ABCDEFGHIJKLMNOPQRSTUVWXYZ

abcdefghijklmnopqrstuvwxy

ABCDEFGHIJKLMNOPQRSTUVWXYZ

abcdefghijklmnopqrstuvwxy

0123456789

4.72 Test X021b

```
\input{umtest-preamble}
\usepackage{unicode-math}
\setmathfont{STIXGeneral-BoldItalic}
\begin{document}
\[\mathbfsfit{\GREEKtext}\]
\[\mathbfsfit{\greektext}\]
\[\mathbfsfit{\GREEKmath}\]
\[\mathbfsfit{\greekmath}\]
\end{document}
```

ΑΒΓΔΕΖΗΘΘΙΚΛΜΝΞΟΠΡΣΤΥΦΧΨΩ
αβγδεεζηθδικκλμνξοπωρρςστυφφχψω
ΑΒΓΔΕΖΗΘΘΙΚΛΜΝΞΟΠΡΣΤΥΦΧΨΩ
αβγδεεζηθδικκλμνξοπωρρςστυφφχψω

4.73 Test X030a

```
\input{umtest-preamble}
\usepackage{unicode-math}
\setmathfont{FreeSerif}
\begin{document}
\[\mathup{\mathbb{F}}\]
\[\mathbf{\mathbb{F}}\]
\end{document}
```

\mathbb{F}
 $\mathbf{\mathbb{F}}$
 \mathbb{F}
 $\mathbf{\mathbb{F}}$

4.74 Test X031a

```
\input{umtest-preamble}
\usepackage[nabla=upright]{unicode-math}
\setmathfont{Free Serif}
\begin{document}
\[\mathbb{N} \quad \mathbb{N} \quad \mathbb{N}\]
\[\mathbb{N} \quad \mathbf{\mathbb{N}} \quad \mathbf{\mathbb{N}}\]
\[\mathup{\mathbb{N}} \quad \mathit{\mathbb{N}}\]
\[\mathbfup{\mathbb{N}} \quad \mathbf{\mathbb{N}}\]
\[\mathbfsfup{\mathbb{N}} \quad \mathbf{\mathbb{N}}\]
\end{document}
```

\mathbb{N} \mathbb{N} \mathbb{N}
 \mathbb{N} $\mathbf{\mathbb{N}}$ $\mathbf{\mathbb{N}}$
 $\mathup{\mathbb{N}}$ $\mathit{\mathbb{N}}$
 $\mathbfup{\mathbb{N}}$ $\mathbf{\mathbb{N}}$
 $\mathbfsfup{\mathbb{N}}$ $\mathbf{\mathbb{N}}$

4.75 Test X031b

```
\input{umtest-preamble}
\usepackage[nabla=italic]{unicode-math}
\setmathfont{Free Serif}
\begin{document}
\[\nabla \quad \nabla \quad \nabla\]
\[\nabla \quad \mathbf{\nabla} \quad \mathbf{sf{\nabla}}\]
\[\mathup{\nabla} \quad \mathit{\nabla}\]
\[\mathbfup{\nabla} \quad \mathbf{fit{\nabla}}\]
\[\mathbfsfup{\nabla} \quad \mathbf{sf{fit{\nabla}}}\]
\end{document}
```

∇ ∇ ∇
 ∇ ∇ ∇
 ∇ ∇
 ∇ ∇
 ∇ ∇

4.76 Test X031c

```
\input{umtest-preamble}
\usepackage[nabla=literal]{unicode-math}
\setmathfont{Free Serif}
\begin{document}
\[\nabla \quad \nabla \quad \nabla\]
\[\nabla \quad \mathbf{\nabla} \quad \mathbf{sf{\nabla}}\]
\[\mathup{\nabla} \quad \mathit{\nabla}\]
\[\mathbfup{\nabla} \quad \mathbf{fit{\nabla}}\]
\[\mathbfsfup{\nabla} \quad \mathbf{sf{fit{\nabla}}}\]
\end{document}
```

∇ ∇ ∇
 ∇ ∇ ∇
 ∇ ∇
 ∇ ∇
 ∇ ∇

4.77 Test X032a

```
\input{umtest-preamble}
\usepackage[partial=upright]{unicode-math}
\setmathfont{Code2001}
\begin{document}
\[\partial \quad \partial \quad \partial\]
\[\partial \quad \mathbf{\partial} \quad \mathbf{sf{\partial}}\]
\[\mathup{\partial} \quad \mathit{\partial}\]
\[\mathbfup{\partial} \quad \mathbf{fit{\partial}}\]
\[\mathbfsfup{\partial} \quad \mathbf{sf{fit{\partial}}}\]
\end{document}
```

∂ ∂ ∂
 ∂ ∂ ∂
 ∂ ∂
 ∂ ∂
 ∂ ∂

4.78 Test X032b

```
\input{umtest-preamble}
\usepackage[partial=italic]{unicode-math}
\setmathfont{Code2001}
\begin{document}
\[\partial \quad \partial \quad \partial\]
\[\partial \quad \mathbf{\partial} \quad \mathbf{sf{\partial}}\]
\[\mathup{\partial} \quad \mathit{\partial}\]
\[\mathbfup{\partial} \quad \mathbf{fit{\partial}}\]
\[\mathbfsfup{\partial} \quad \mathbf{sf{fit{\partial}}}\]
\end{document}
```

$\partial \quad \partial \quad \partial$

$\partial \quad \partial \quad \partial$

$\partial \quad \partial$

$\partial \quad \partial$

$\partial \quad \partial$

4.79 Test X032c

```
\input{umtest-preamble}
\usepackage[partial=literal]{unicode-math}
\setmathfont{Code2001}
\begin{document}
\[\partial \quad \partial \quad \partial\]
\[\partial \quad \mathbf{\partial} \quad \mathbf{sf{\partial}}\]
\[\mathup{\partial} \quad \mathit{\partial}\]
\[\mathbfup{\partial} \quad \mathbf{fit{\partial}}\]
\[\mathbfsfup{\partial} \quad \mathbf{sf{fit{\partial}}}\]
\end{document}
```

$\partial \quad \partial \quad \partial$

$\partial \quad \partial \quad \partial$

$\partial \quad \partial$

$\partial \quad \partial$

$\partial \quad \partial$

4.80 Test X033a

```
\input{umtest-preamble}
\usepackage{unicode-math}
\begin{document}
\setmathfont[math-style=TeX]{Free Serif}
\[\mathup{1} \quad \mathup{2}\]
\[\mathit{1} \quad \mathit{2}\]
\setmathfont[math-style=upright]{Free Serif}
\[\mathup{1} \quad \mathup{2}\]
\[\mathit{1} \quad \mathit{2}\]
\end{document}
```

$1 \quad 2$

$1 \quad 2$

$1 \quad 2$

$1 \quad 2$

$1 \quad 2$

$1 \quad 2$

4.81 Test X100a

```

\input{umtest-preamble}
\usepackage{unicode-math}
\setmathfont{Cambria Math}
\begin{document}
\[ \left( \left( \left( \left( \left( \left( x^2 \right)^2 \right)^2 \right)^2 \right)^2 \right)^2 \right) ]
\end{document}

```

$$\left(\left(\left(\left(\left(\left(x^2\right)^2\right)^2\right)^2\right)^2\right)^2\right)$$

4.82 Test X100b

<pre> \input{umtest-preamble} \usepackage{unicode-math} \setmathfont{Cambria Math} \begin{document} \[\left[\left[\left[\left[\left[\left[x^2 \right]^2 \right]^2 \right]^2 \right]^2 \right]^2 \right]^2 \right] \] \end{document} </pre>	
---	--

$$\left[\left[\left[\left[\left[x^2\right]^2\right]^2\right]^2\right]^2\right]^2$$

4.83 Test X100c

[illegible]

$$\left\{ \left\{ \left\{ \left\{ \left\{ \{x^2\}^2 \right\}^2 \right\}^2 \right\}^2 \right\}^2 \right\}$$

4.84 Test X100d

```
\input{umtest-preamble}
\usepackage{unicode-math}
\setmathfont{Cambria Math}
\begin{document}
```

[illegible][illegible]

[illegible]

4.85 Test X100e

```
\input{umtest-preamble}
\usepackage{unicode-math}
\setmathfont{Cambria Math}
\begin{document}
```

[illegible][illegible]

[illegible]

4.86 Test X101a

```
\input{umtest-preamble}
\usepackage{unicode-math}
\setmathfont{Cambria Math}
\begin{document}
```

$$\backslash[a>b \quad \backslashquad c<d \quad \backslash]$$
$$\left[\left(\left(\left(\left(x \right)^2 \right)^2 \right)^2 \right)^2 \right]$$

\end{document}

$$a > b \quad c < d$$

$$\left\langle \left\langle \left\langle \langle x \rangle^2 \right\rangle^2 \right\rangle^2 \right\rangle$$

4.87 Test X102a

```
\input{umtest-preamble}
\usepackage[slash-delimiter=frac]{unicode-math}
\setmathfont{Cambria Math}
\begin{document}
\[ \left.\left[\begin{array}{cc}
a & b \\ c & d
\end{array}\right]\right|
\middle/
\left[\begin{array}{cc}
1 & 1 \\ 1 & 0
\end{array}\right]\right].
\]
\end{document}
```

$$\begin{bmatrix} a & b \\ c & d \end{bmatrix} / \begin{bmatrix} 1 & 1 \\ 1 & 0 \end{bmatrix}$$

4.88 Test X150a

```
\input{umtest-preamble}
\usepackage{amsmath,unicode-math}
\setmathfont{Cambria Math}
\begin{document}
\centerline{$\int\!\!\!\int\!\!\!\int$}
[\int\!\!\!\int\!\!\!\int\!]
\end{document}
```

$$\begin{array}{ccc} \int & \int & \cdots \int \\ \int & \int & \cdots \int \end{array}$$

4.89 Test X151a

<code>\input{umtest-preamble}</code>	\hat{i}	\hat{x}	\hat{M}	$\widehat{x+y}$
<code>\usepackage{unicode-math}</code>				
<code>\setmathfont{Cambria Math}</code>	\hat{i}	\hat{x}	\hat{M}	$\widehat{x+y}$
<code>\begin{document}</code>				
<code>\[\hat{i} \quad \hat{x} \quad \hat{M} \quad \hat{x+y}]</code>	\tilde{i}	\tilde{x}	\tilde{M}	$\widetilde{x+y}$
<code>\[\widehat{i} \quad \widehat{x} \quad \widehat{M} \quad \widehat{x+y}]</code>				
<code>\[\tilde{i} \quad \tilde{x} \quad \tilde{M} \quad \tilde{x+y}]</code>				
<code>\[\widetilde{i} \quad \widetilde{x} \quad \widetilde{M} \quad \widetilde{x+y}]</code>				
<code>\end{document}</code>				

\hat{i}	\hat{x}	\hat{M}	$\widehat{x+y}$
\hat{i}	\hat{x}	\hat{M}	$\widehat{x+y}$
\tilde{i}	\tilde{x}	\tilde{M}	$\widetilde{x+y}$
$\widehat{\widehat{i}}$	$\widehat{\widehat{x}}$	$\widehat{\widehat{M}}$	$\widehat{\widehat{x+y}}$

4.90 Test X202a

```
\input{umtest-preamble}
\usepackage{unicode-math}
\setmathfont{Cambria Math}
\begin{document}
\[a\colon b\qqquad a: b
\qqquad a^{^^^2236} b\]
\end{document}
```

$$a\colon b \qquad a: b \qquad a: b$$

4.91 Test X202b

```
\input{umtest-preamble}
\usepackage[colon=literal]{unicode-math}
\setmathfont{Cambria Math}
\begin{document}
\[a\colon b\qqquad a: b
\qqquad a^{^^^2236} b\]
\end{document}
```

$$a: b \qquad a: b \qquad a: b$$

4.92 Test X203a

```
\input{umtest-preamble}
\usepackage{unicode-math}
\setmathfont{Cambria Math}
\begin{document}
\[a-b\]
\[a\minus b\]
\end{document}
```

$$a - b$$
$$a - b$$

4.93 Test X206a

```
\input{umtest-preamble}
\usepackage{unicode-math}
\setmathfont{Cambria Math}
\begin{document}
\[A+B+\dots+Z\]
\[(A+B+\dots)\]
\[(A+B+\cdots)\]
\end{document}
```

$$A + B + \dots + Z$$

$$(A + B + \dots)$$

$$(A + B + \cdots)$$

4.94 Test X206b

```
\input{umtest-preamble}
\usepackage{amsmath}
\usepackage{unicode-math}
\setmathfont{Cambria Math}
\begin{document}
\[A+B+\dots+Z\]
\[(A+B+\dots)\]
\[(A+B+\cdots)\]
\end{document}
```

$$A + B + \dots + Z$$

$$(A + B + \dots)$$

$$(A + B + \cdots)$$

4.95 Test X206c

```
\input{umtest-preamble}
\usepackage{amsmath}
\usepackage{unicode-math}
\setmathfont{Cambria Math}
\begin{document}
\[ a\% b \% c \]
\[ a\mathdollar b \$ c \]
\[ a\& b \& c \]
\[ a\octothorpe b \# c \]
\end{document}
```

$$a\%b\%c$$

$$a\$b\$c$$

$$a\&b\&c$$

$$a\#b\#c$$

4.96 Test X207a

```
\input{umtest-preamble}
\usepackage{amsmath}
\usepackage{unicode-math}
\setmathfont{Cambria Math}
\begin{document}
\unimathsetup{active-frac=normalsize}
\[ \frac{1}{2} \frac{3}{4} \frac{1}{7} \frac{1}{9} \frac{1}{10} \frac{2}{3} \frac{1}{3} \frac{2}{5} \frac{3}{5} \frac{4}{5} \frac{1}{6} \frac{5}{6} \frac{1}{8} \frac{3}{8} \frac{5}{8} \frac{7}{8} \]
\unimathsetup{active-frac=small}
\[ \frac{1}{2} \frac{3}{4} \frac{1}{7} \frac{1}{9} \frac{1}{10} \frac{2}{3} \frac{1}{3} \frac{2}{5} \frac{3}{5} \frac{4}{5} \frac{1}{6} \frac{5}{6} \frac{1}{8} \frac{3}{8} \frac{5}{8} \frac{7}{8} \]
\end{document}
```

$$\frac{1}{2} \frac{3}{4} \frac{1}{7} \frac{1}{9} \frac{1}{10} \frac{2}{3} \frac{1}{3} \frac{2}{5} \frac{3}{5} \frac{4}{5} \frac{1}{6} \frac{5}{6} \frac{1}{8} \frac{3}{8} \frac{5}{8} \frac{7}{8}$$

4.97 Test X401a

```
\input{umtest-preamble}
\usepackage{unicode-math}
\setmathfont{XITS Math}
\begin{document}
```

$$x = 1.23 \quad x = 1,23$$

```
\setmathfont{Cambria Math}

\[ x=1.23 \quad x=1,23 \]

\end{document}
```

4.98 Test X500a

```
\input{umtest-preamble}
\usepackage{unicode-math}
\setmathfont[Colour=000000]{Cambria Math}
\setmathfont[range={\mathop}, Colour=FF0000]{Cambria Math}
\setmathfont[range={"3D"}, Colour=009900]{Cambria Math}
\setmathfont[range={\mathopen,\mathclose},
               Colour=0000FF]{Cambria Math}
\setlength\parskip{12pt}
\begin{document}
\[
F(s) = \mathscr{L} \left\{ f(t) \right\} =
\int_0^\infty e^{-st} f(t) \, \mathrm{d}t
\]
```

$$F(s) = \mathcal{L}\{f(t)\} = \int_0^\infty e^{-st} f(t) \, \mathrm{d}t$$

4.99 Test X501a

```
\input{umtest-preamble}
\usepackage{unicode-math}
\setmathfont[Colour=000000]{Cambria Math}
\setmathfont[range=\mathscr, Colour=FF0000]{Cambria Math}
\setmathfont[range=\mathfrak, Colour=0000FF]{Cambria Math}
\begin{document}
\[\text{latin text}\]
\[\mathscr{latin text}\]
\[\mathfrak{latin text}\]
\[\text{LATINmath}\]
\[\mathscr{LATINmath}\]
\[\mathfrak{LATINmath}\]
\end{document}
```

abcdefghijklmnopqrstuvwxyz
abcdefghijklmnopqrstuvwxyz
abcdefghijklmnopqrstuvwxyz
ABCDEFGHIJKLMNOPQRSTUVWXYZ
ABCDEFGHIJKLMNOPQRSTUVWXYZ
ABCDEFGHIJKLMNOPQRSTUVWXYZ

4.100 Test X501b

```
\input{umtest-preamble}
\usepackage{unicode-math}
\setmathfont[Colour=000000]{Cambria Math}
\setmathfont[range=\mathscr, Colour=FF0000]{TeX Gyre Chorus}
\begin{document}
\[\text{latin text}\]
\[\mathscr{latin text}\]
\[\text{LATINmath}\]
\[\mathscr{LATINmath}\]
\end{document}
```

abcdefghijklmnopqrstuvwxyz
abcdefghijklmnopqrstuvwxyz
ABCDEFGHIJKLMNOPQRSTUVWXYZ
ABCDEFGHIJKLMNOPQRSTUVWXYZ

4.101 Test X501d

```
\input{umtest-preamble}
\usepackage{unicode-math}
\setmathfont[Colour=330000]{Cambria Math}
\setmathfont[range=\mathit/{latin}, Colour=660000]{Cambria Math}
\setmathfont[range=\mathit/{greek}, Colour=990000]{Cambria Math}
\setmathfont[range=\mathit/{greek}, Colour=BB0000]{Cambria Math}
\setmathfont[range=\mathup/{num}, Colour=EE0000]{Cambria Math}
\begin{document}
\[\mathit{LATINtext}\]
\[\mathit{latin text}\]
\[\mathit{GREEKtext}\]
\[\mathit{greek text}\]
\[\text{0123456789}\]
\end{document}
```

abcdefghijklmnopqrstuvwxyz
ABCDEFGHIJKLMNOPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz
ABCDEFGHIJKLMNOPQRSTUVWXYZ
ABCDEFGHIJKLMNOPQRSTUVWXYZ
αβγδεζηθικλμνξοπρστυφχψω
0123456789

4.102 Test X501e

```
\input{umtest-preamble}
\usepackage{unicode-math}
\setmathfont[
  range={
    \mathit/{latin}->\mathbfup ,
    \mathit/{Latin}->\mathsfup
  }
]{Cambria Math}
\setmathfont[
  range={
    \mathup/{GreeK}->\mathbfup ,
    \mathit/{greek}->\mathbfit
  },
  Colour=990000
]{Cambria Math}
\begin{document}
\vspace*{-1cm}
\[\backslash\text{LATINtext}\backslash\]
\[\backslash\text{latin}\backslash\]
\[\backslash\mathit{\backslash\text{LATINtext}}\backslash\]
\[\backslash\mathit{\backslash\text{latin}}\backslash\]
\[\backslash\{\text{GREEKtext}\}\backslash\]
\[\backslash\{\text{greek}\}\backslash\]
\[\backslash\mathup{\backslash\text{GREEKtext}}\backslash\]
\[\backslash\mathit{\backslash\text{greek}}\backslash\]
\end{document}
```

ABCDEFGHIJKLMNOPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz
ABCDEFGHIJKLMNOPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz
ΑΒΓΔΕΖΗΘΙΚΑΜΝΞΟΠΡΣΤΥΦΧΨΩ
αβγδεεζηθθικκλμνξοπωρρςστυφφχψω
ΑΒΓΔΕΖΗΘΙΚΑΜΝΞΟΠΡΣΤΥΦΧΨΩ
αβγδεεζηθθικκλμνξοπωρρςστυφφχψω

4.103 Test X502a

```
\input{umtest-preamble}
\usepackage{unicode-math}
\setmathfont{STIXGeneral}
\setmathfont
  [range={\mathit,\mathsf,\mathscr}]
  {STIXGeneral-Italic}
\setmathfont
  [range={\mathbfup,\mathbffrak,
    \mathbfsfup}]
  {STIXGeneral-Bold}
\setmathfont
  [range={\mathbfit,\mathbfsfit,\mathbfscr}]
  {STIXGeneral-BoldItalic}
\begin{document}
\[\backslash\mathit{A}\backslash\mathup{A}
  \backslash\mathsfup{A}\backslash\mathsf{A}\backslash\]
\[\backslash\mathscr{A}\backslash\mathfrak{A}\backslash\mathbb{A}\backslash\]
\[\backslash\mathbfup{A}\backslash\mathbfit{A}
  \backslash\mathbfsfup{A}\backslash\mathbfsfit{A}\backslash\]
\[\backslash\mathbfscr{A}\backslash\mathbffrak{A}\backslash\]
\end{document}
```

AAAA
<i>A A</i>
AAAA
<i>A A</i>

4.104 Test X502b

```
\input{umtest-preamble}
\usepackage{unicode-math}
\setmathfont{XITS Math}
\begin{document}
Default:
\[
(a+b)^2 = \sqrt{c+d}
\]
\setmathfont[range={\mathup}]{Linux Libertine}
\setmathfont[range={\mathit}]{Linux Libertine Italic}
Example of a non-math OpenType font:
\[
(a+b)^2 = \sqrt{c+d}
\]
With symbols:
\setmathfont[range={`\+,`\=,`\(`,\)}]{Linux Libertine}
\[
(a+b)^2 = \sqrt{c+d}
\]
\end{document}
```

Default:

$$(a+b)^2 = \sqrt{c+d}$$

Example of a non-math OpenType font:

$$(a+b)^2 = \sqrt{c+d}$$

With symbols:

$$(a+b)^2 = \sqrt{c+d}$$

4.105 Test X503a

```
\input{umtest-preamble}
\usepackage{unicode-math}
\begin{document}
\setmathfont{XITS Math}
\[
\mathscr{\text{LATINtext}}
\]
\[
\mathcal{\text{LATINtext}}
\]
\setmathfont[range={\mathcal,\mathbfcal},StylisticSet=11]{XITS Math}
\[
\mathscr{\text{LATINtext}}
\]
\[
\mathcal{\text{LATINtext}}
\]
\footnotesize
\[
\mathbfcal{\text{LATINtext}}
\]
\end{document}
```

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

4.106 Test X600a

```
\input{umtest-preamble}
\usepackage{amsmath}
\begin{document}
\[
\sum_{\substack{a \\ bbb}} \sum_{\substack{1 \\ 2 \\ A'}} \sum_{\substack{a \\ bbb}}
\]
\end{document}
```

$$\sum_{\substack{a \\ bbb}} \sum_{\substack{1 \\ 2 \\ A'}} \sum_{\substack{a \\ bbb}}$$

4.107 Test X600b

```
\input{umtest-preamble}
\usepackage{amsmath}
\usepackage{unicode-math}
\setmathfont{Cambria Math}
\begin{document}
\[
\sum_{\substack{a \\ bbb}} \sum_{\substack{1 \\ \frac{2}{A'}}} \sum_{\substack{a \\ bbb}}
\sum_{\substack{\dfrac{12}{2} \\ \vec{A}'}}
\sum_{\begin{subarray}{l} a \\ bbb \end{subarray}}
\]
\end{document}
```

$$\sum_{\substack{a \\ bbb}} \sum_{\substack{1 \\ \frac{2}{A'}}} \sum_{\substack{a \\ bbb}}$$

4.108 Test X600c

```
\input{umtest-preamble}
\usepackage{amsmath}
\usepackage{unicode-math}
\setmathfont{Asana Math}
\begin{document}
\[
\sum_{\substack{a \\ bbb}} \sum_{\substack{1 \\ \frac{2}{A'}}} \sum_{\substack{a \\ bbb}}
\sum_{\substack{\dfrac{12}{2} \\ \vec{A}'}}
\sum_{\begin{subarray}{l} a \\ bbb \end{subarray}}
\]
\end{document}
```

$$\sum_{\substack{a \\ bbb}} \sum_{\substack{1 \\ \frac{2}{A'}}} \sum_{\substack{a \\ bbb}}$$

4.109 Test X600d

```
\input{umtest-preamble}
\usepackage{amsmath}
\usepackage{unicode-math}
\setmathfont{Neo Euler}
\begin{document}
\[
\sum_{\substack{a \\ bbb}} \sum_{\substack{1 \\ \frac{2}{A'}}} \sum_{\substack{a \\ bbb}}
\sum_{\substack{\dfrac{12}{2} \\ \vec{A}'}}
\sum_{\begin{subarray}{l} a \\ bbb \end{subarray}}
\]
\end{document}
```

$$\sum_{\substack{a \\ bbb}} \sum_{\substack{1 \\ \frac{2}{A'}}} \sum_{\substack{a \\ bbb}}$$

4.110 Test X600f

```
\input{umtest-preamble}
\usepackage{amsmath}
\usepackage{unicode-math}
\setmathfont{XITS Math}
\begin{document}
\[
\sum_{\substack{a \\\ bbb}}
\sum_{\substack{\dfrac{12}{\phantom{00}} \\\ \vec{A'}}}
\sum_{\begin{subarray}{l} 1 \end{subarray}} a \\\ bbb \end{subarray}}
\]
\end{document}
```

$$\sum_a \sum_{bbb} \frac{1}{2} \sum_{bbb} \frac{1}{A}$$

4.111 Test X601a

```

\input{umtest-preamble}
\usepackage{mathtools}
\begin{document}
\[
\frac{a^2 + b^2}{a^2 + b^2}
\frac{\cramped{a^2 + b^2}}{a^2 + b^2}
\frac{a^2 + b^2}{\cramped{a^2 + b^2}}
\]
\[
\frac{a^2 + b^2}{a^2 + b^2}
\frac{\cramped{a^2 + b^2}}{a^2 + b^2}
\frac{a^2 + b^2}{\cramped{a^2 + b^2}}
a^{\{
\frac{a^2 + b^2}{a^2 + b^2}
\frac{\cramped{a^2 + b^2}}{a^2 + b^2}
\frac{a^2 + b^2}{\cramped{a^2 + b^2}}
\}}
a^{\{
a^{\{
\frac{a^2 + b^2}{a^2 + b^2}
\frac{\cramped{a^2 + b^2}}{a^2 + b^2}
\frac{a^2 + b^2}{\cramped{a^2 + b^2}}
\}}
\}}
\]
\end{document}

```

$$\frac{a^2 + b^2}{a^2 + b^2} \frac{a^2 + b^2}{a^2 + b^2} \frac{a^2 + b^2}{a^2 + b^2}$$

```

\input{umtest-preamble}
\usepackage{mathtools}
\usepackage{unicode-math}
\setmathfont{Cambria Math}
\begin{document}
\[
\frac{a^2 + b^2}{a^2 + b^2}
\frac{\cramped{a^2 + b^2}}{a^2 + b^2}
\frac{a^2 + b^2}{\cramped{a^2 + b^2}}
\]
\(\frac{a^2 + b^2}{a^2 + b^2}\)
\(\frac{\cramped{a^2 + b^2}}{a^2 + b^2}\)
\(\frac{a^2 + b^2}{\cramped{a^2 + b^2}}\)
a^{
  \frac{a^2 + b^2}{a^2 + b^2}
  \frac{\cramped{a^2 + b^2}}{a^2 + b^2}
  \frac{a^2 + b^2}{\cramped{a^2 + b^2}}
}
a^{
  a^{
    \frac{a^2 + b^2}{a^2 + b^2}
    \frac{\cramped{a^2 + b^2}}{a^2 + b^2}
    \frac{a^2 + b^2}{\cramped{a^2 + b^2}}
  }
}
\end{document}

```

$$\frac{a^2+b^2}{a^2+b^2} \cdot \frac{a^2+b^2}{a^2+b^2} \cdot \frac{a^2+b^2}{a^2+b^2}$$

```

\input{umtest-preamble}
\usepackage{mathtools}
\usepackage{unicode-math}
\setmathfont{XITS Math}
\begin{document}
\[
\frac{a^2 + b^2}{a^2 + b^2}
\frac{\cramped{a^2 + b^2}}{a^2 + b^2}
\frac{a^2 + b^2}{\cramped{a^2 + b^2}}
\]
\(\frac{a^2 + b^2}{a^2 + b^2}\)
\(\frac{\cramped{a^2 + b^2}}{a^2 + b^2}\)
\(\frac{a^2 + b^2}{\cramped{a^2 + b^2}}\)
a^{\frac{a^2 + b^2}{a^2 + b^2}}
a^{\frac{\cramped{a^2 + b^2}}{a^2 + b^2}}
a^{\frac{a^2 + b^2}{\cramped{a^2 + b^2}}}
\}
a^{\frac{a^2 + b^2}{a^2 + b^2}}
a^{\frac{\cramped{a^2 + b^2}}{a^2 + b^2}}
a^{\frac{a^2 + b^2}{\cramped{a^2 + b^2}}}
\}
\}
\end{document}

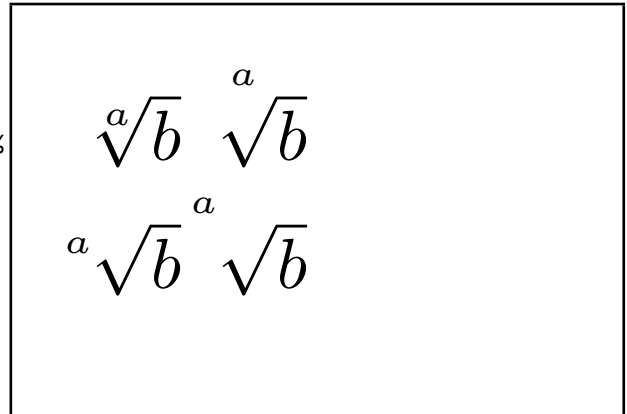
```

$$\frac{a^2 + b^2}{a^2 + b^2} \frac{a^2 + b^2}{a^2 + b^2} \frac{a^2 + b^2}{a^2 + b^2}$$

4.114 Test X604a

```
\input{umtest-preamble}
\usepackage{amsmath}
\usepackage{graphicx}
\newcommand*{\test}[1]{%
  \parbox[b][50pt][50pt]{\scalebox{3}{\$#1\$}}%
}
\begin{document}
\test{\sqrt[a]{b}}
\test{\sqrt[\uproot{10}a]{b}}

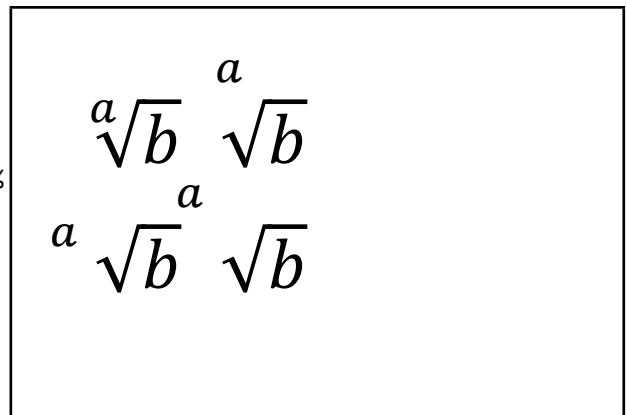
\test{\sqrt[\leftroot{10}a]{b}}
\test{\sqrt[\leftroot{10}\uproot{10}a]{b}}
\end{document}
```



4.115 Test X604b

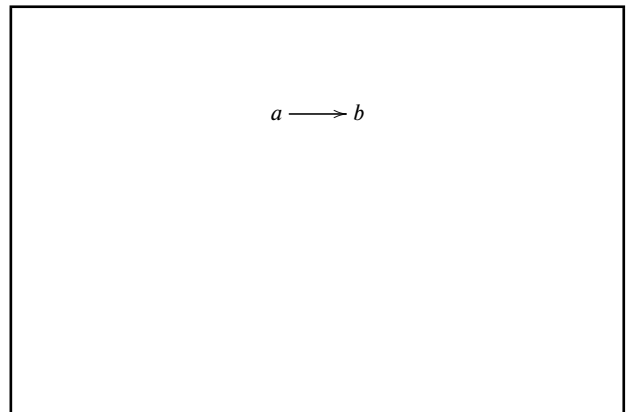
```
\input{umtest-preamble}
\usepackage{unicode-math}
\usepackage{amsmath}
\usepackage{graphicx}
\setmathfont{Cambria Math}
\newcommand*{\test}[1]{%
  \parbox[b][50pt][50pt]{\scalebox{3}{\$#1\$}}%
}
\begin{document}
\test{\sqrt[a]{b}}
\test{\sqrt[\uproot{10}a]{b}}

\test{\sqrt[\leftroot{10}a]{b}}
\test{\sqrt[\leftroot{10}\uproot{10}a]{b}}
\end{document}
```



4.116 Test X610f

```
\input{umtest-preamble}
\usepackage{unicode-math}
\setmathfont{XITS Math}
\usepackage{all,pdf}{xy}
\begin{document}
\[
\mathrm{xymatrix{a \ar[r] & b}}
\]
\end{document}
```



4.117 Test X620b

```
\input{umtest-preamble}
\usepackage{unicode-math}
\usepackage{delarray}
\setmathfont{Cambria Math}
\begin{document}
\[
\begin{array}[t]({c}) 1\!2\!3 \end{array}
\begin{array}[c]({c}) 1\!2\!3 \end{array}
\begin{array}[b]({c}) 1\!2\!3 \end{array}
\]
\end{document}
```

$$\begin{pmatrix} 1 \\ 2 \\ 3 \end{pmatrix} \begin{pmatrix} 1 \\ 2 \\ 3 \end{pmatrix} \begin{pmatrix} 1 \\ 2 \\ 3 \end{pmatrix}$$

4.118 Test X650a

```
\input{umtest-preamble}
\usepackage{unicode-math}
\usepackage{mathtools}
\setmathfont{Cambria Math}
\begin{document}
\[
\coloneq
\coloneqq
\eqcolon
\eqqcolon
\]
\end{document}
```

\coloneq

4.119 Test X650b

```
\input{umtest-preamble}
\usepackage{unicode-math}
\usepackage{colonequals}
\setmathfont{Cambria Math}
\begin{document}
\[
\coloneq
\colonequals
\eqcolon
\equalscolon
\]
\end{document}
```

\colonequals