

The LibertinusT1 Math Package

Michael Sharpe

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This package is a \LaTeX math package to accompany the \LaTeX Libertine text package, serving as an alternative to `newtxmath` with the `libertine` option. Both packages use the Greek and Roman letters from Libertine, but `LibertinusT1Math` symbols are mostly taken from the `LibertinusMath` font which extends and corrects Libertine, while `newtxmath` uses symbols matching Times in weight and size, and so are a bit heavier and larger. I've changed a number of glyphs from `LibertinusMath` and added dozens of new glyphs. Like `LibertinusMath`, `LibertinusT1Math` does not contain calligraphic, script or gothic alphabets. The package sets `\mathcal` to the (unscaled) STIX calligraphic font and `\mathbb` to the `LibertinusT1Math` double-struck alphabet. The `mathalpha` package (loaded AFTER `libertinust1math`) offers a convenient way to change these default choices and to set the script and gothic alphabets. See the sample invocation below, which assumes you have `mathalpha` version 1.08 (March 2016) or higher.

ADDITIONS IN VERSION 1.1: There is now support for sans serif fonts in math that allows the ISO typesetting rules to be followed, and to provide a math processing system using sans serif Roman and Greek letters. See the end of this documentation for details.

ADDITIONS IN VERSION 1.1.8: There is now support for the scaling options in both the old `libertine` and the new `libertinus[-type1]` packages. Prior versions supported only earlier `libertine` package[s]. The details are spelled out below in the discussion of the `scaled` package option.

CHANGES AND ADDITIONS IN VERSION 2.0: Prior versions of `libertinust1math` were based on the glyphs in `LibertinusMath.otf` from late 2015. This version is based on the late 2021 font which made a number of important changes.

- The math axis changed from 251 to 260.
- The symbol sizes were enlarged substantially.

The overly small symbols of prior versions are no longer a concern. Additions include some of the features of `newtxmath`: a `subscriptcorrection` option to improve the kerning of some problem glyphs such as j, f, β in subscripts; an adaptive vector accent with macro `\vv` so that you can write `\vv{XY}` to get \overrightarrow{XY} , placing an arrow of appropriate length over any mathematical expression; a `\widebar` macro was copied from `newtxmath` so that `\widebar{XY}` results in \overline{XY} . See the documentation of `newtx` for further details on these.

ADDITIONS IN VERSION 2.0.3: Subscript corrections are now read from the file `libertinus-subst.tex` in the `/libertinust1math/tex/` folder of the `tex` distribution. You may copy and modify it, placing it in your local files so that it is seen by `tex` ahead of the copy in the distribution. It is also possible to specify another file by means of option `subscriptcorrectionfile=`. The file format is discussed in the documentation of `newtx`.

The left sidebearings of the mathematical italic Roman and Greek letters were modified to match those in version 1 of `LibertinusT1Math`. This goes part way to solve one of the issues of version 2.0, in which italic text with interspersed math fragment, as the statement of a theorem, could be typeset poorly. For a bad example, consider `\textit{if } U` , which renders as *if* U with U rather close to *f*. The factors involved are:

- Italic Libertinus has interword spacing of 2.5pt (assuming 10pt text) with stretch and shrink of 1.25pt and .0833pt respectively.
- Italic Libertinus *f* has an italic correction of .208em (2.0pt with 20pt text.)

- U has a left sidebearing of $.122em$ so the horizontal gap between the right edge of f and the left edge of U is, with $10pt$ text, $(2.5-2.08+.122)pt$, or $1.64pt$. (This assumes no stretch or shrink in the line. In the worst case, it could be $.833pt$ less.) The separation may be improved considerably by adding italic correction ($\!/$) after the f , but this is not a good solution.

I've added in version 2.0.3 a replacement `\textth` for `\textit` that is more suited to italic text with embedded fragments of math, having expanded interword spacing of $.32em$, stretch of $.16em$ and shrink of $.1em$, all of which are configurable by means of options `spc`, `stretch`, `shrink`. (Option `spacing` is equivalent to `spc`.) With `\textth`, you also get upright punctuation and parentheses, etc. and tabular lining figures which match math figures. Increased interword spacing reduces the visible effects of large italic corrections.

There is a new option `theoremfont` which patches the plain `theoremstyle`, resulting in the body font for the theorem statement being changed to use `\textth`.

PACKAGE OPTIONS:

- **New in v.2.0** `subscriptcorrection` allows for a number of problem letters to behave better in subscripts, but at the cost of compatibility with the `xy` package.
- **New in v.2.0** `amsthm` loads the corresponding package in the proper order relative to `amsmath`. `lcgreekalpha` makes lower-case Greek letters be of type `mathalpha` rather than `mathord`, forcing them to respond to alphabet changing commands such as `\mathnormal`, `\mathrm`, `\mathit` and `\mathsf`.
- `upint` changes the style of integrals from the default *slanted* \int to *upright* \int .
- `frenchmath` changes the math style to use upright Greek and Roman capital letters rather than math italic shapes.
- `slantedGreek` makes uppercase Greek math letters slanted.
- `uprightGreek` makes uppercase Greek math letters upright. This is the default except in ISO mode.
- `scaled` (or `scale` may be used change the scale of the math. The `fd` files in this package respond to three scale-changing macros:
 - `\LinuxLibertineT@scale`, set from option `llscale` (or `llscaled`) to the `libertine` package;
 - `\LibertinusRM@scale`, set by option `ScaleRM` to the `libertinus-type1` package or to the `libertinus` package;
 - `\libus@scale`, set by the `scaled` option to `libertinust1math`.

The current `libertineRoman` package contains no option that affects the scale parameter. If you need to scale `libertineRoman`, add to your preamble lines like

```
\makeatletter
\newcommand*{\LinuxLibertineT@scale}{1.03}
\makeatother
```

If `\libus@scale` is defined, it takes precedence over the other two settings. The result on math scaling only of the different possible scale settings is:

- the `scaled` option to `libertinust1math` overrides all other scale settings;
- if you did not issue a `scale` or `scaled` option to `libertinust1math`, then
 - * if you used a `libertine` package that set a value for `\LinuxLibertineT@scale`, then its value is used;
 - * otherwise, if you used `libertinus-type1` or `libertinus`, then the value of `\LibertinusRM@scale` is used.
- See the new material at the end for a discussion of the new options connected with sans serif in math.

SAMPLE INVOCATION:

```

\usepackage[sb]{libertine} % or \usepackage[sb]{libertinus}
\usepackage[T1]{fontenc}
\usepackage{textcomp}
\usepackage[varqu,varl]{zi4}% inconsolata for mono, not LibertineMono
\usepackage[amsthm]{libertinust1math} % slanted integrals, by default
\usepackage[scr=boondoxo,bb=boondox]{mathalpha} %omit bb=boondox for default libertine bb

```

SOME THINGS TO NOTE:

- The `amsmath` package is loaded, if necessary, by `libertinust1math`. The package depends on a number of its features and improvements to math typesetting.
- There are no bold symbols in `LibertinusMath`, but there are bold Roman and Greek letters, and the same is true of `LibertinusT1Math`.
- The italic letter v (ν) in `LibertinusMath` is easily confused with Greek ν (ν), so the math italic letter v is set to ν , and similarly in the bold math version.
- The layout of the `type1` math fonts follows STIX to some extent, as does the `sty` file, though the content of this package is much less rich.
- `Dotlessi` and `dotlessj` are available in four math styles—`mathit`, `mathrm`, `mathbf` and `mathbfit`. For example:

Macro	Result
<code>\mathit</code>	<i>i</i>
<code>\mathrm</code>	i
<code>\mathbf</code>	<i>i</i>
<code>\mathbfit</code>	<i>i</i>

- There are Greek alphabets in upright and italic shapes, regular and bold weights. Upright Greek letters have names like `\alphaup` (and `\upalpha`) while the italic forms have names like `\alphait`. According to the options you set, `\alpha` and so on are `\let` to the appropriate choice, but you may always use the underlying forms if you wish to use both upright and italic forms in your document.
- Uppercase Greek letters are of type `mathalpha`, so when you write `\mathit{\Gamma}`, you'll get Γ . However, unless you chose the option `lcgreekalpha`, `\mathrm{\beta}` would produce β , as it is of type `mathord` by default.
- There is an upright partial derivative symbol named `\uppartial` that typesets as ∂ , for those who wish to follow ISO rules.
- There are (as of version 1.1) macros for mathematical sans serif: `\mathsf`, `\mathsfit` (italic sans), `\mathsfbf` (bold sans) and `\mathsfbfit` (bold sans italic.) See the end of this documentation for details.
- If you use one of the AMS classes such as `amsart` or `amsbook`, then the AMS fonts will be loaded even though not needed, taking up two of your precious sixteen math families. If you are running out of families (“too many math alphabets used in version normal”), use another capable class such as `memoir` or `scrartcl` and gain two more families.

The next pages show the font tables for `LibertinusT1Math`. If you see an unfamiliar symbol and wish to learn its \TeX name, get the \TeX name of the font (e.g., `operators`, `letters`, `symbols`, `largesymbols`) and the hex location of the glyph (e.g., “FF is hex notation for 255) and search `libertinust1math.sty` by hex number.

libertinust1-mathrm (operators):

	´0	´1	´2	´3	´4	´5	´6	´7	
´00x	Γ_0	Δ_1	Θ_2	Λ_3	Ξ_4	Π_5	Σ_6	Y_7	"0x
´01x	Φ_8	Ψ_9	Ω_{10}	α_{11}	β_{12}	γ_{13}	δ_{14}	ϵ_{15}	
´02x	ζ_{16}	η_{17}	θ_{18}	ι_{19}	κ_{20}	λ_{21}	μ_{22}	ν_{23}	"1x
´03x	ξ_{24}	π_{25}	ρ_{26}	σ_{27}	τ_{28}	υ_{29}	ϕ_{30}	χ_{31}	
´04x	ψ_{32}	ω_{33}	ϵ_{34}	ϑ_{35}	ω_{36}	ϱ_{37}	ς_{38}	φ_{39}	"2x
´05x	∇_{40}	∂_{41}	$-_{42}$	$+_{43}$	\pm_{44}	\mp_{45}	$(_{46}$	$)_{47}$	
´06x	0_{48}	1_{49}	2_{50}	3_{51}	4_{52}	5_{53}	6_{54}	7_{55}	"3x
´07x	8_{56}	9_{57}	$:_{58}$	$;_{59}$	$*_{60}$	$=_{61}$	$\$_{62}$	$?_{63}$	
´10x	$!_{64}$	A_{65}	B_{66}	C_{67}	D_{68}	E_{69}	F_{70}	G_{71}	"4x
´11x	H_{72}	I_{73}	J_{74}	K_{75}	L_{76}	M_{77}	N_{78}	O_{79}	
´12x	P_{80}	Q_{81}	R_{82}	S_{83}	T_{84}	U_{85}	V_{86}	W_{87}	"5x
´13x	X_{88}	Y_{89}	Z_{90}	$[_{91}$	\backslash_{92}	$]_{93}$	$\{_{94}$	$/_{95}$	
´14x	$\}_96$	a_{97}	b_{98}	c_{99}	d_{100}	e_{101}	f_{102}	g_{103}	"6x
´15x	h_{104}	i_{105}	j_{106}	k_{107}	l_{108}	m_{109}	n_{110}	o_{111}	
´16x	p_{112}	q_{113}	r_{114}	s_{115}	t_{116}	u_{117}	v_{118}	w_{119}	"7x
´17x	x_{120}	y_{121}	z_{122}	l_{123}	j_{124}	$\#_{125}$	$\%_{126}$	$'_{127}$	
´20x	$\grave{ }_{128}$	$\acute{ }_{129}$	$\hat{ }_{130}$	$\tilde{ }_{131}$	$\bar{ }_{132}$	$\breve{ }_{133}$	$\dot{ }_{134}$	$\ddot{ }_{135}$	"8x
´21x	$\overscript{ }_{136}$	$\overset{ }_{137}$	$\underscript{ }_{138}$	$\underset{ }_{139}$	$\underscript{ }_{140}$	$\overscript{ }_{141}$	$\underscript{ }_{142}$	$\overscript{ }_{143}$	
´22x	$\overleftarrow{ }_{144}$	$\overleftarrow{ }_{145}$	$\overrightarrow{ }_{146}$	$\overleftarrow{ }_{147}$	$\overleftarrow{ }_{148}$	$\overleftarrow{ }_{149}$	\lrcorner_{150}	\ulcorner_{151}	"9x
´23x	$*_{152}$	$\&_{153}$	$@_{154}$	\neg_{155}	\cdot_{156}	\times_{157}	\leq_{158}	\div_{159}	
´24x	Z_{160}	\wp_{161}	\Im_{162}	\dagger_{163}	\ddagger_{164}	\bullet_{165}	\dots_{166}	\dots_{167}	"Ax
´25x	$/_{168}$	$//_{169}$	$///_{170}$	\backslash_{171}	$\backslash\backslash_{172}$	$\backslash\backslash\backslash_{173}$	\wedge_{174}	$!!_{175}$	
´26x	\blacksquare_{176}	$/_{177}$	$??_{178}$	$_{179}$	$///_{180}$	\dagger_{181}	$_{182}$	$_{183}$	"Bx
´27x	\asymp_{184}	$_{185}$	\mathcal{E}_{186}	\mathcal{O}_{187}	$_{188}$	\mathring{A}_{189}	\mathcal{J}_{190}	\mathcal{D}_{191}	
´30x	\top_{192}	\perp_{193}	λ_{194}	$_{195}$	\mathfrak{X}_{196}	\mathfrak{V}_{197}	\mathcal{C}_{198}	\exists_{199}	"Cx
´31x	\mathfrak{H}_{200}	\emptyset_{201}	Δ_{202}	\in_{203}	\notin_{204}	\in_{205}	\ni_{206}	\ni_{207}	
´32x	\ni_{208}	\blacksquare_{209}	\dagger_{210}	\succeq_{211}	\setminus_{212}	\circ_{213}	\bullet_{214}	α_{215}	"Dx
´33x	∞_{216}	\perp_{217}	\angle_{218}	\sphericalangle_{219}	\sphericalangle_{220}	$ _{221}$	\uparrow_{222}	\parallel_{223}	
´34x	\parallel_{224}	\wedge_{225}	\vee_{226}	\cap_{227}	\cup_{228}	$\dot{\cdot}_{229}$	$\ddot{\cdot}_{230}$	\emptyset_{231}	"Ex
´35x	$\ddot{\cdot}_{232}$	\div_{233}	$\dot{-}_{234}$	$\ddot{-}_{235}$	$\dot{\div}_{236}$	\sim_{237}	\frown_{238}	∞_{239}	
´36x	\sim_{240}	\wr_{241}	\sphericalangle_{242}	\approx_{243}	\simeq_{244}	\neq_{245}	\cong_{246}	$\not\cong_{247}$	"Fx
´37x	\neq_{248}	\approx_{249}	\neq_{250}	\cong_{251}	\cong_{252}	\cong_{253}	\mathcal{K}_{254}	\approx_{255}	
	"8	"9	"A	"B	"C	"D	"E	"F	

libertinust1-mathrm (bold-operators):

	´0	´1	´2	´3	´4	´5	´6	´7	
´00x	Γ_0	Δ_1	Θ_2	Λ_3	Ξ_4	Π_5	Σ_6	Y_7	"0x
´01x	Φ_8	Ψ_9	Ω_{10}	α_{11}	β_{12}	γ_{13}	δ_{14}	ϵ_{15}	
´02x	ζ_{16}	η_{17}	θ_{18}	ι_{19}	κ_{20}	λ_{21}	μ_{22}	ν_{23}	"1x
´03x	ξ_{24}	π_{25}	ρ_{26}	σ_{27}	τ_{28}	υ_{29}	ϕ_{30}	χ_{31}	
´04x	ψ_{32}	ω_{33}	ϵ_{34}	ϑ_{35}	ϖ_{36}	ϱ_{37}	ς_{38}	φ_{39}	"2x
´05x	∇_{40}	∂_{41}	$-_{42}$	$+_{43}$	\pm_{44}	\mp_{45}	$(_{46}$	$)_{47}$	
´06x	0_{48}	1_{49}	2_{50}	3_{51}	4_{52}	5_{53}	6_{54}	7_{55}	"3x
´07x	8_{56}	9_{57}	$:_{58}$	$;_{59}$	$*_{60}$	$=_{61}$	$\$_{62}$	$?_{63}$	
´10x	$!_{64}$	A_{65}	B_{66}	C_{67}	D_{68}	E_{69}	F_{70}	G_{71}	"4x
´11x	H_{72}	I_{73}	J_{74}	K_{75}	L_{76}	M_{77}	N_{78}	O_{79}	
´12x	P_{80}	Q_{81}	R_{82}	S_{83}	T_{84}	U_{85}	V_{86}	W_{87}	"5x
´13x	X_{88}	Y_{89}	Z_{90}	$[_{91}$	\backslash_{92}	$]_{93}$	$\{_{94}$	$/_{95}$	
´14x	$\}_96$	a_{97}	b_{98}	c_{99}	d_{100}	e_{101}	f_{102}	g_{103}	"6x
´15x	h_{104}	i_{105}	j_{106}	k_{107}	l_{108}	m_{109}	n_{110}	o_{111}	
´16x	p_{112}	q_{113}	r_{114}	s_{115}	t_{116}	u_{117}	v_{118}	w_{119}	"7x
´17x	x_{120}	y_{121}	z_{122}	$!_{123}$	J_{124}	$\#_{125}$	$\%_{126}$	$'_{127}$	
´20x	$\`_{128}$	$\^{\prime}_{129}$	$\hat{\ }_{130}$	$\tilde{\ }_{131}$	$\bar{\ }_{132}$	$\check{\ }_{133}$	\cdot_{134}	$\ddot{\ }_{135}$	"8x
´21x	$\overset{\prime}{\ }_{136}$	$\overset{\circ}{\ }_{137}$	$\overset{\vee}{\ }_{138}$	$\overset{\smile}{\ }_{139}$	$\overset{\frown}{\ }_{140}$	$\overset{\prime}{\ }_{141}$	$\overset{\frown}{\ }_{142}$	$\overset{\frown}{\ }_{143}$	
´22x	$\overleftarrow{\ }_{144}$	$\overleftarrow{\ }_{145}$	$\overrightarrow{\ }_{146}$	$\overleftarrow{\ }_{147}$	$\overleftarrow{\ }_{148}$	$\overleftarrow{\ }_{149}$	\lrcorner_{150}	\ulcorner_{151}	"9x
´23x	$*_{152}$	$\&_{153}$	$@_{154}$	\neg_{155}	\prime_{156}	\times_{157}	\leq_{158}	\div_{159}	
´24x	Z_{160}	$\text{\textcircled{1}}_{161}$	$\text{\textcircled{2}}_{162}$	$\text{\textcircled{3}}_{163}$	$\text{\textcircled{4}}_{164}$	\bullet_{165}	\dots_{166}	\dots_{167}	"Ax
´25x	$/_{168}$	$//_{169}$	$///_{170}$	\backslash_{171}	$\backslash\backslash_{172}$	$\backslash\backslash\backslash_{173}$	$\text{\textasciitilde}_{174}$	$!!_{175}$	
´26x	$\text{\textcircled{1}}_{176}$	$\text{\textcircled{2}}_{177}$	$??_{178}$	$_{179}$	$///_{180}$	$\text{\textcircled{1}}_{181}$	$_{182}$	$_{183}$	"Bx
´27x	\asymp_{184}	$_{185}$	\mathcal{E}_{186}	\mathcal{O}_{187}	$_{188}$	\mathring{A}_{189}	$\text{\textcircled{1}}_{190}$	\mathcal{D}_{191}	
´30x	$\text{\textcircled{1}}_{192}$	$\text{\textcircled{2}}_{193}$	$\text{\textcircled{3}}_{194}$	$_{195}$	$\text{\textcircled{4}}_{196}$	$\text{\textcircled{5}}_{197}$	\mathcal{C}_{198}	$\text{\textcircled{3}}_{199}$	"Cx
´31x	$\text{\textcircled{2}}_{200}$	$\text{\textcircled{3}}_{201}$	Δ_{202}	\in_{203}	\notin_{204}	\in_{205}	\ni_{206}	$\text{\textcircled{4}}_{207}$	
´32x	\ni_{208}	\blacksquare_{209}	\dagger_{210}	\succeq_{211}	\setminus_{212}	\circ_{213}	\bullet_{214}	∞_{215}	"Dx
´33x	∞_{216}	\perp_{217}	\angle_{218}	\sphericalangle_{219}	\sphericalangle_{220}	$ _{221}$	\updownarrow_{222}	\parallel_{223}	
´34x	\parallel_{224}	\wedge_{225}	\vee_{226}	\cap_{227}	\cup_{228}	\therefore_{229}	\because_{230}	\emptyset_{231}	"Ex
´35x	\therefore_{232}	\div_{233}	\neg_{234}	$\ddot{\ }_{235}$	\sim_{236}	\sim_{237}	\sim_{238}	∞_{239}	
´36x	\sim_{240}	\sim_{241}	$\not\sim_{242}$	\approx_{243}	\approx_{244}	\neq_{245}	\cong_{246}	$\not\cong_{247}$	"Fx
´37x	\neq_{248}	\approx_{249}	\neq_{250}	\cong_{251}	\cong_{252}	\cong_{253}	\times_{254}	\approx_{255}	
	"8	"9	"A	"B	"C	"D	"E	"F	

libertinust1-mathit (letters):

	´0	´1	´2	´3	´4	´5	´6	´7	
´00x	Γ_0	Δ_1	Θ_2	Λ_3	Ξ_4	Π_5	Σ_6	Y_7	"0x
´01x	Φ_8	Ψ_9	Ω_{10}	α_{11}	β_{12}	γ_{13}	δ_{14}	ϵ_{15}	
´02x	ζ_{16}	η_{17}	θ_{18}	ι_{19}	κ_{20}	λ_{21}	μ_{22}	ν_{23}	"1x
´03x	ξ_{24}	π_{25}	ρ_{26}	σ_{27}	τ_{28}	υ_{29}	ϕ_{30}	χ_{31}	
´04x	ψ_{32}	ω_{33}	ε_{34}	ϑ_{35}	ω_{36}	ϱ_{37}	ς_{38}	φ_{39}	"2x
´05x	∇_{40}	∂_{41}	\aleph_{42}	\beth_{43}	\aleph_{44}	\beth_{45}	\triangleright_{46}	\triangleleft_{47}	
´06x	0_{48}	1_{49}	2_{50}	3_{51}	4_{52}	5_{53}	6_{54}	7_{55}	"3x
´07x	8_{56}	9_{57}	\cdot_{58}	\cdot_{59}	$<_{60}$	\hbar_{61}	$>_{62}$	\star_{63}	
´10x	\neq_{64}	A_{65}	B_{66}	C_{67}	D_{68}	E_{69}	F_{70}	G_{71}	"4x
´11x	H_{72}	I_{73}	J_{74}	K_{75}	L_{76}	M_{77}	N_{78}	O_{79}	
´12x	P_{80}	Q_{81}	R_{82}	S_{83}	T_{84}	U_{85}	V_{86}	W_{87}	"5x
´13x	X_{88}	Y_{89}	Z_{90}	b_{91}	$\#_{92}$	$\#_{93}$	\smile_{94}	\frown_{95}	
´14x	\hbar_{96}	a_{97}	b_{98}	c_{99}	d_{100}	e_{101}	f_{102}	g_{103}	"6x
´15x	h_{104}	i_{105}	j_{106}	k_{107}	l_{108}	m_{109}	n_{110}	o_{111}	
´16x	p_{112}	q_{113}	r_{114}	s_{115}	t_{116}	u_{117}	v_{118}	w_{119}	"7x
´17x	x_{120}	y_{121}	z_{122}	l_{123}	J_{124}	\neq_{125}	\ll_{126}	\frown_{127}	
´20x	$\grave{\text{a}}_{128}$	$\acute{\text{a}}_{129}$	$\hat{\text{a}}_{130}$	$\tilde{\text{a}}_{131}$	$\bar{\text{a}}_{132}$	$\check{\text{a}}_{133}$	$\dot{\text{a}}_{134}$	$\ddot{\text{a}}_{135}$	"8x
´21x	$\overset{\circ}{\text{a}}_{136}$	$\overset{\circ}{\text{a}}_{137}$	$\underset{\circ}{\text{a}}_{138}$	$\underset{\circ}{\text{a}}_{139}$	$\overset{\circ}{\text{a}}_{140}$	$\overset{\circ}{\text{a}}_{141}$	$\overset{\circ}{\text{a}}_{142}$	$\overset{\circ}{\text{a}}_{143}$	
´22x	$\overleftarrow{\text{a}}_{144}$	$\overleftarrow{\text{a}}_{145}$	$\overrightarrow{\text{a}}_{146}$	$\overleftarrow{\text{a}}_{147}$	$\overleftarrow{\text{a}}_{148}$	$\overleftrightarrow{\text{a}}_{149}$	\lrcorner_{150}	\llcorner_{151}	"9x
´23x	\ast_{152}	$\bar{\text{a}}_{153}$	$\hat{\text{a}}_{154}$	$\tilde{\text{a}}_{155}$	$\check{\text{a}}_{156}$	\frown_{157}	\smile_{158}	\frown_{159}	
´24x	$\overbrace{\text{a}}_{160}$	$\overbrace{\text{a}}_{161}$	$\overbrace{\text{a}}_{162}$	$\overbrace{\text{a}}_{163}$	$\overbrace{\text{a}}_{164}$	$\overbrace{\text{a}}_{165}$	$\overbrace{\text{a}}_{166}$	$\overbrace{\text{a}}_{167}$	"Ax
´25x	$\overbrace{\text{a}}_{168}$	$\overbrace{\text{a}}_{169}$	$\overbrace{\text{a}}_{170}$	$\overbrace{\text{a}}_{171}$	$\overbrace{\text{a}}_{172}$	$\overbrace{\text{a}}_{173}$	$\overbrace{\text{a}}_{174}$	$\overbrace{\text{a}}_{175}$	
´26x	$\overbrace{\text{a}}_{176}$	$\overbrace{\text{a}}_{177}$	$\overbrace{\text{a}}_{178}$	$\overbrace{\text{a}}_{179}$	\lrcorner_{180}	\llcorner_{181}	\lrcorner_{182}	\llcorner_{183}	"Bx
´27x	\gg_{184}	\S_{185}	\neq_{186}	\neq_{187}	\neq_{188}	\neq_{189}	\neq_{190}	\leq_{191}	
´30x	\geq_{192}	\neq_{193}	\neq_{194}	\leq_{195}	\geq_{196}	\neq_{197}	\neq_{198}	\prec_{199}	"Cx
´31x	\succ_{200}	\leq_{201}	\succ_{202}	\leq_{203}	\succ_{204}	\neq_{205}	\neq_{206}	\subset_{207}	
´32x	\supset_{208}	\subset_{209}	\supset_{210}	\subset_{211}	\supset_{212}	\subset_{213}	\supset_{214}	\subset_{215}	"Dx
´33x	\supset_{216}	\supset_{217}	\supset_{218}	\supset_{219}	\sqsubset_{220}	\sqsupset_{221}	\sqsubset_{222}	\sqsupset_{223}	
´34x	\sqcap_{224}	\sqcup_{225}	\oplus_{226}	\ominus_{227}	\otimes_{228}	\oslash_{229}	\odot_{230}	\odot_{231}	"Ex
´35x	\otimes_{232}	\ominus_{233}	\ominus_{234}	\oplus_{235}	\oplus_{236}	\boxtimes_{237}	\square_{238}	\vdash_{239}	
´36x	\dashv_{240}	\top_{241}	\perp_{242}	\vdash_{243}	\vDash_{244}	\vDash_{245}	\vDash_{246}	\vDash_{247}	"Fx
´37x	\vDash_{248}	\vDash_{249}	\vDash_{250}	\vDash_{251}	\vDash_{252}	\vDash_{253}	\vDash_{254}	\trianglelefteq_{255}	
	"8	"9	"A	"B	"C	"D	"E	"F	

libertinust1-mathit-bold (bold-letters):

	´0	´1	´2	´3	´4	´5	´6	´7	
´00x	Γ_0	Δ_1	Θ_2	Λ_3	Ξ_4	Π_5	Σ_6	Y_7	"0x
´01x	Φ_8	Ψ_9	Ω_{10}	α_{11}	β_{12}	γ_{13}	δ_{14}	ϵ_{15}	
´02x	ζ_{16}	η_{17}	θ_{18}	ι_{19}	κ_{20}	λ_{21}	μ_{22}	ν_{23}	"1x
´03x	ξ_{24}	π_{25}	ρ_{26}	σ_{27}	τ_{28}	υ_{29}	ϕ_{30}	χ_{31}	
´04x	ψ_{32}	ω_{33}	ϵ_{34}	ϑ_{35}	\wp_{36}	ϱ_{37}	ς_{38}	φ_{39}	"2x
´05x	V_{40}	∂_{41}	\aleph_{42}	\beth_{43}	\aleph_{44}	\beth_{45}	\triangleright_{46}	\triangleleft_{47}	
´06x	0_{48}	1_{49}	2_{50}	3_{51}	4_{52}	5_{53}	6_{54}	7_{55}	"3x
´07x	8_{56}	9_{57}	\cdot_{58}	\cdot_{59}	$<_{60}$	\hbar_{61}	$>_{62}$	\star_{63}	
´10x	\neq_{64}	A_{65}	B_{66}	C_{67}	D_{68}	E_{69}	F_{70}	G_{71}	"4x
´11x	H_{72}	I_{73}	J_{74}	K_{75}	L_{76}	M_{77}	N_{78}	O_{79}	
´12x	P_{80}	Q_{81}	R_{82}	S_{83}	T_{84}	U_{85}	V_{86}	W_{87}	"5x
´13x	X_{88}	Y_{89}	Z_{90}	b_{91}	$\#_{92}$	$\#_{93}$	\smile_{94}	\frown_{95}	
´14x	\hbar_{96}	a_{97}	b_{98}	c_{99}	d_{100}	e_{101}	f_{102}	g_{103}	"6x
´15x	h_{104}	i_{105}	j_{106}	k_{107}	l_{108}	m_{109}	n_{110}	o_{111}	
´16x	p_{112}	q_{113}	r_{114}	s_{115}	t_{116}	u_{117}	v_{118}	w_{119}	"7x
´17x	x_{120}	y_{121}	z_{122}	l_{123}	J_{124}	\neq_{125}	\ll_{126}	\frown_{127}	
´20x	$\grave{\text{a}}_{128}$	$\acute{\text{a}}_{129}$	$\hat{\text{a}}_{130}$	$\tilde{\text{a}}_{131}$	$\bar{\text{a}}_{132}$	$\check{\text{a}}_{133}$	$\dot{\text{a}}_{134}$	$\ddot{\text{a}}_{135}$	"8x
´21x	$\text{ˆ}{a}_{136}$	$\text{ˆ}{a}_{137}$	$\text{ˆ}{a}_{138}$	$\text{ˆ}{a}_{139}$	$\text{ˆ}{a}_{140}$	$\text{ˆ}{a}_{141}$	$\text{ˆ}{a}_{142}$	$\text{ˆ}{a}_{143}$	
´22x	$\overleftarrow{\text{a}}_{144}$	$\overleftarrow{\text{a}}_{145}$	$\overrightarrow{\text{a}}_{146}$	$\overleftarrow{\text{a}}_{147}$	$\overleftarrow{\text{a}}_{148}$	$\overleftrightarrow{\text{a}}_{149}$	\lrcorner_{150}	\llcorner_{151}	"9x
´23x	\ast_{152}	$\text{ˆ}{a}_{153}$	$\text{ˆ}{a}_{154}$	$\text{ˆ}{a}_{155}$	$\text{ˆ}{a}_{156}$	$\text{ˆ}{a}_{157}$	$\text{ˆ}{a}_{158}$	$\text{ˆ}{a}_{159}$	
´24x	$\overbrace{\text{a}}_{160}$	$\overbrace{\text{a}}_{161}$	$\overbrace{\text{a}}_{162}$	$\overbrace{\text{a}}_{163}$	$\overbrace{\text{a}}_{164}$	$\overbrace{\text{a}}_{165}$	$\overbrace{\text{a}}_{166}$	$\overbrace{\text{a}}_{167}$	"Ax
´25x	$\overbrace{\text{a}}_{168}$	$\overbrace{\text{a}}_{169}$	$\overbrace{\text{a}}_{170}$	$\overbrace{\text{a}}_{171}$	$\overbrace{\text{a}}_{172}$	$\overbrace{\text{a}}_{173}$	$\overbrace{\text{a}}_{174}$	$\overbrace{\text{a}}_{175}$	
´26x	$\overbrace{\text{a}}_{176}$	$\overbrace{\text{a}}_{177}$	$\overbrace{\text{a}}_{178}$	$\overbrace{\text{a}}_{179}$	\lrcorner_{180}	\lrcorner_{181}	\lrcorner_{182}	\lrcorner_{183}	"Bx
´27x	\gg_{184}	$\text{ˆ}{a}_{185}$	\neq_{186}	\neq_{187}	\neq_{188}	\neq_{189}	\neq_{190}	\leq_{191}	
´30x	\geq_{192}	\neq_{193}	\neq_{194}	\leq_{195}	\geq_{196}	\neq_{197}	\neq_{198}	\prec_{199}	"Cx
´31x	\succ_{200}	\leq_{201}	\geq_{202}	\leq_{203}	\succ_{204}	\neq_{205}	\neq_{206}	\subset_{207}	
´32x	\supset_{208}	\subset_{209}	\supset_{210}	\subset_{211}	\supset_{212}	\subset_{213}	\supset_{214}	\subset_{215}	"Dx
´33x	\supset_{216}	\supset_{217}	\supset_{218}	\supset_{219}	\sqsubset_{220}	\sqsubset_{221}	\sqsubset_{222}	\sqsubset_{223}	
´34x	\sqcap_{224}	\sqcap_{225}	\oplus_{226}	\ominus_{227}	\otimes_{228}	\oslash_{229}	\odot_{230}	\odot_{231}	"Ex
´35x	\otimes_{232}	\ominus_{233}	\ominus_{234}	\oplus_{235}	\oplus_{236}	\boxtimes_{237}	\square_{238}	\vdash_{239}	
´36x	\dashv_{240}	\top_{241}	\perp_{242}	\vdash_{243}	\vDash_{244}	\vDash_{245}	\vDash_{246}	\vDash_{247}	"Fx
´37x	\vDash_{248}	\vDash_{249}	\vDash_{250}	\vDash_{251}	\vDash_{252}	\vDash_{253}	\vDash_{254}	\trianglelefteq_{255}	
	"8	"9	"A	"B	"C	"D	"E	"F	

libertinust1-mathsym (symbols):

	´0	´1	´2	´3	´4	´5	´6	´7	
´00x	\triangleright_0	\bullet_1	\circ_2	\int_3	\iint_4	\iiint_5	ϕ_6	\iiiii_7	"0x
´01x	f_8	\iint_9	\iiiii_{10}	ϕ_{11}	\cdot_{12}	\iiiii_{13}	\bowtie_{14}	\bowtie_{15}	
´02x	\times_{16}	Π_{17}	Π_{18}	\simeq_{19}	\forall_{20}	\wedge_{21}	Σ_{22}	\perp_{23}	"1x
´03x	\mathfrak{H}_{24}	\setminus_{25}	\rceil_{26}	\sphericalangle_{27}	\ll_{28}	\gg_{29}	\llll_{30}	\gggg_{31}	
´04x	\lesssim_{32}	\gtrsim_{33}	\lesssim_{34}	\gtrsim_{35}	\lll_{36}	\ggg_{37}	\llll_{38}	\gggg_{39}	"2x
´05x	∇_{40}	∇_{41}	∇_{42}	∇_{43}	∇_{44}	∇_{45}	∇_{46}	∇_{47}	
´06x	∇_{48}	∇_{49}	∇_{50}	∇_{51}	\vdots_{52}	\cdots_{53}	\ddots_{54}	\ddots_{55}	"3x
´07x	∇_{56}	∇_{57}	∇_{58}	∇_{59}	∇_{60}	∇_{61}	∇_{62}	∇_{63}	
´10x	\mathfrak{D}_{64}	\mathfrak{C}_{65}	\mathfrak{P}_{66}	\leftarrow_{67}	\uparrow_{68}	\rightarrow_{69}	\downarrow_{70}	\leftrightarrow_{71}	"4x
´11x	\updownarrow_{72}	\nearrow_{73}	\nearrow_{74}	\searrow_{75}	\swarrow_{76}	\leftrightarrow_{77}	\leftrightarrow_{78}	\leftrightarrow_{79}	
´12x	\mapsto_{80}	\leftarrow_{81}	\curvearrowright_{82}	\leftrightarrow_{83}	\leftarrow_{84}	\leftarrow_{85}	\rightarrow_{86}	\rightarrow_{87}	"5x
´13x	\leftrightarrow_{88}	\leftrightarrow_{89}	\leftarrow_{90}	\rightarrow_{91}	\leftrightarrow_{92}	\leftarrow_{93}	\mapsto_{94}	\emptyset_{95}	
´14x	\doteq_{96}	\doteq_{97}	\doteq_{98}	\doteq_{99}	\doteq_{100}	\doteq_{101}	\doteq_{102}	\doteq_{103}	"6x
´15x	\doteq_{104}	\doteq_{105}	\doteq_{106}	\doteq_{107}	\doteq_{108}	\doteq_{109}	\doteq_{110}	\doteq_{111}	
´16x	\doteq_{112}	\neq_{113}	\equiv_{114}	\neq_{115}	\parallel_{116}	\parallel_{117}	\equiv_{118}	\leq_{119}	"7x
´17x	\geq_{120}	\leq_{121}	\geq_{122}	\Re_{123}	\Im_{124}	\wp_{125}	\square_{126}	\frown_{127}	
´20x	\clubsuit_{128}	\diamond_{129}	\heartsuit_{130}	\spadesuit_{131}	$\♯_{132}$	\circ_{133}	\S_{134}	\P_{135}	"8x
´21x	$\sqrt{\quad}_{136}$	$_{}_{137}$	$_{}_{138}$	ℓ_{139}	\mathfrak{F}_{140}	\mathfrak{F}_{141}	142	143	
´22x	144	145	146	147	148	149	150	151	"9x
´23x	152	153	154	\lrcorner_{155}	156	157	158	159	
´26x	176	177	178	179	180	181	\lrcorner_{182}	\blacksquare_{183}	"Bx
´27x	\square_{184}	185	186	187	188	189	190	191	
´30x	192	193	194	195	196	197	198	\rightarrow_{199}	"Cx
´31x	200	\blacktriangle_{201}	\triangle_{202}	\ll_{203}	\ll_{204}	$\blacktriangleright_{205}$	\triangleright_{206}	207	
´32x	208	209	210	\blacktriangledown_{211}	\triangledown_{212}	213	214	\blacktriangleleft_{215}	"Dx
´33x	\triangleleft_{216}	\leftarrow_{217}	\Rightarrow_{218}	\leftrightarrow_{219}	\leftarrow_{220}	\blacklozenge_{221}	\diamond_{222}	\Rightarrow_{223}	
´34x	\odot_{224}	\diamond_{225}	\circ_{226}	\neg_{227}	\neg_{228}	\circ_{229}	\bullet_{230}	231	"Ex
´35x	232	233	234	235	236	237	238	\nleftrightarrow_{239}	
´36x	\leftrightarrow_{240}	\nleftrightarrow_{241}	\leftarrow_{242}	\upuparrows_{243}	\Rightarrow_{244}	\Downarrow_{245}	\leftrightarrow_{246}	\Updownarrow_{247}	"Fx
´37x	\swarrow_{248}	\nearrow_{249}	\searrow_{250}	\swarrow_{251}	\leftarrow_{252}	\circ_{253}	\diamond_{254}	\Rightarrow_{255}	
	"8	"9	"A	"B	"C	"D	"E	"F	

libertinust1-mathex (largesymbols):

	'0	'1	'2	'3	'4	'5	'6	'7	
'00x	$(_0)$	$)_1$	$_2$	$_3$	$[_4$	$]_5$	$[[_6$	$]]_7$	"0x
'01x	\lfloor_8	\rfloor_9	\llbracket_{10}	\rrbracket_{11}	$\{^{12}$	$\}^{13}$	$_14$	$_15$	
'02x	\langle_{16}	\rangle_{17}	\ll_{18}	\gg_{19}	$_20$	$_21$	$/_{22}$	\backslash_{23}	"1x
'03x	$(_{24}$	$)_{25}$	$_26$	$_27$	$[_{28}$	$]_{29}$	$[[_{30}$	$]]_{31}$	
'04x	\lfloor_{32}	\rfloor_{33}	\llbracket_{34}	\rrbracket_{35}	$\{^{36}$	$\}^{37}$	$_38$	$_39$	"2x
'05x	\langle_{40}	\rangle_{41}	\ll_{42}	\gg_{43}	$_44$	$_45$	$/_{46}$	\backslash_{47}	
'06x	$(_{48}$	$)_{49}$	$_50$	$_51$	$[_{52}$	$]_{53}$	$[[_{54}$	$]]_{55}$	"3x
'07x	\lfloor_{56}	\rfloor_{57}	\llbracket_{58}	\rrbracket_{59}	$\{^{60}$	$\}^{61}$	$_62$	$_63$	
'10x	\langle_{64}	\rangle_{65}	\ll_{66}	\gg_{67}	$_68$	$_69$	$/_{70}$	\backslash_{71}	"4x
'11x	$(_{72}$	$)_{73}$	$_74$	$_75$	$[_{76}$	$]_{77}$	$[[_{78}$	$]]_{79}$	
'12x	\lfloor_{80}	\rfloor_{81}	\llbracket_{82}	\rrbracket_{83}	$\{^{84}$	$\}^{85}$	$_86$	$_87$	"5x
'13x	\langle_{88}	\rangle_{89}	\ll_{90}	\gg_{91}	$_92$	$_93$	$/_{94}$	\backslash_{95}	
'14x	\lrcorner_{96}	\llcorner_{97}	\llbracket_{98}	\rrbracket_{99}	\lrcorner_{100}	\llcorner_{101}	\lrcorner_{102}	\llcorner_{103}	"6x
'15x	\ulcorner_{104}	\urcorner_{105}	\llcorner_{106}	\lrcorner_{107}	\lrcorner_{108}	\llcorner_{109}	\lrcorner_{110}	\lrcorner_{111}	
'16x	\ulcorner_{112}	\urcorner_{113}	\lrcorner_{114}	\llcorner_{115}	$\sqrt{^{116}}$	$\sqrt{^{117}}$	$\sqrt{^{118}}$	$\sqrt{^{119}}$	"7x
'17x	\lrcorner_{120}	\llcorner_{121}	$\sqrt{^{122}}$	$\sqrt{^{123}}$	$\sqrt{^{124}}$	$\sqrt{^{125}}$	\int_{126}	\int_{127}	

'20x	\iint_{128}	\iint_{129}	\iiint_{130}	\iiint_{131}	\oint_{132}	\oint_{133}	\iiiii_{134}	\iiiii_{135}	"8x
'21x	\int_{136}	\int_{137}	\iint_{138}	\iint_{139}	\iint_{140}	\iint_{141}	\oint_{142}	\oint_{143}	
'22x	\iiiii_{144}	\iiiii_{145}	\oint_{146}	\oint_{147}	\oint_{148}	\oint_{149}	150	151	"9x
'23x	152	153	154	155	156	157	158	159	
'26x	176	Π_{177}	Π_{178}	Σ_{179}	\wedge_{180}	\vee_{181}	\cap_{182}	\cup_{183}	"Bx
'27x	$/_{184}$	\backslash_{185}	\odot_{186}	\oplus_{187}	\otimes_{188}	\cup_{189}	\oplus_{190}	\sqcap_{191}	
'30x	\sqcup_{192}	193	194	195	196	197	198	Π_{199}	"Cx
'31x	Π_{200}	Σ_{201}	\wedge_{202}	\vee_{203}	\cap_{204}	\cup_{205}	$/_{206}$	\backslash_{207}	
'32x	\odot_{208}	\oplus_{209}	\otimes_{210}	\cup_{211}	\oplus_{212}	\sqcap_{213}	\sqcup_{214}	215	"Dx
'33x	216	217	218	219	$(_{220}$	$)_{221}$	222	223	
'34x	\llbracket_{224}	\rrbracket_{225}	\lfloor_{226}	\rfloor_{227}	\lceil_{228}	\rceil_{229}	\int_{230}	\int_{231}	"Ex
'35x	232	233	\langle_{234}	\rangle_{235}	\ll_{236}	\gg_{237}	238	239	
'36x	$ _{240}$	\parallel_{241}	242	$ _{243}$	\parallel_{244}	245	246	247	"Fx
'37x	248	$\sqrt{\quad}_{249}$	250	251	252	253	254	255	
	"8	"9	"A	"B	"C	"D	"E	"F	

libertinust1-mathbb (mathbb):

	´0	´1	´2	´3	´4	´5	´6	´7	
´10x	64	A ₆₅	B ₆₆	C ₆₇	D ₆₈	E ₆₉	F ₇₀	G ₇₁	"4x
´11x	H ₇₂	I ₇₃	J ₇₄	K ₇₅	L ₇₆	M ₇₇	N ₇₈	O ₇₉	
´12x	P ₈₀	Q ₈₁	R ₈₂	S ₈₃	T ₈₄	U ₈₅	V ₈₆	W ₈₇	"5x
´13x	X ₈₈	Y ₈₉	Z ₉₀	91	92	93	94	95	
´14x	96	a ₉₇	b ₉₈	c ₉₉	d ₁₀₀	e ₁₀₁	f ₁₀₂	g ₁₀₃	"6x
´15x	h ₁₀₄	i ₁₀₅	j ₁₀₆	k ₁₀₇	l ₁₀₈	m ₁₀₉	n ₁₁₀	o ₁₁₁	
´16x	p ₁₁₂	q ₁₁₃	r ₁₁₄	s ₁₁₅	t ₁₁₆	u ₁₁₇	v ₁₁₈	w ₁₁₉	"7x
´17x	x ₁₂₀	y ₁₂₁	z ₁₂₂	l ₁₂₃	J ₁₂₄	125	126	∩ ₁₂₇	
	"8	"9	"A	"B	"C	"D	"E	"F	

NEW SANS SERIF ALPHABETS:

With the new additions to `libertinust1math`, starting with version 1.1, there are substantial changes to the handling of sans serif. The changes have the following goals.

- Provide a math package with which all ISO typesetting rules may be followed.
- Simultaneously, add options for the non-ISO user to be able to make better use of sans serif math symbols.
- Provide the option of sans serif Roman and Greek math letters together with math symbols from `libertinust1math`, which may be useful to those who like to make their slides using sans serif for enhanced readability at lower resolutions.

Thanks go to Claudio Beccari for convincing me that the effort involved was worthwhile, at least for the ISO case.

Four fonts parallel to the serified roman and italic (regular and bold) have been added, with sans serif alphanumeric symbols based on those in STIX, but slightly reduced in size and the italics reworked to match the italic slant of `libertine`. (Aside from `Biolinum Roman`, the `Biolinum` fonts are not, in my opinion, suitable for use as sans math to accompany `libertinust1math`.) Glyphs in the four fonts may be accessed by the macros `\mathsf`, `\mathsfbf`, `\mathsfit` and `\mathsfbfit`, though not all of these may be defined, depending on the options you set.

NEW PACKAGE OPTIONS AND MACROS:

I've followed to some extent the options and macros in the `isomath` package.

- `nosans` provides the bare minimum access to sans serif math letters, preserving just `\mathsf` and its bold counterpart, `\mathsfbf`. This option keeps the use of additional math families to a minimum. (If you make no use of those macros, no new math families are created.) If `nosans` is not specified, new symbol fonts `sans` and `sansi` are declared, along with bold versions, and `\mathsfbfit` is declared to be the bold italic sans math alphabet. Two of the available sixteen math families will be committed.
- Option `lcgreekalpha` allows proper handling of alphabet changes for lower-case Greek letters. (They are `mathord` by default—this option changes them to `mathalpha`, so that you do in fact get the expected sans Greek when you enter `\mathsf{\phi}`.)
- ISO specifies changes needed to conform to ISO typesetting rules. If specified, the following changes will occur.
 - Option `nosans` is turned off, if present, and option `mathsfit` is ignored unless the additional option `mathsfit` is specified.
 - Option `lcgreekalpha` is turned on, allowing proper handling of alphabet changes for lower-case Greek letters.
 - Option `slantedGreek` is turned on, as required by ISO rules.
 - New commands are provided: `\mathboldsans` means `\mathsfbfit`, and `\mathbold` means `\mathbfit`, while each of `\vectorsym`, `\matrixsym` means `\mathbfit`, and `\ensorsym` means `\mathsfbfit`. For example, `,\matrixsym{A}` renders as **A**, in accordance with ISO rules.
 - If you add the option `mathsfit`, then you also have access to sans italic math, which ISO regards as an option for some special cases. This will use another math family.
 - The option `reuseMathAlphabets` may be added, and can reduce math family usage by redefining `\mathbf` to mean `\mathbfit` (math bold italic) and `\mathsf` to mean `\mathsfbfit` (sans math bold italic.)
 - As it may be important to keep track of your math families when using ISO, I've added `\ShowMathFamilies`. If you get an error message “too many math alphabets used in version normal”, run the macro just before the error location to get an idea of its cause.
- `mathsfit` may be used without ISO, with the same effect described under the ISO heading.
- `reuseMathAlphabets` may be used without ISO, but really makes sense only under ISO.

- `sansmath` sets `nosans` and substitutes sans letters (Roman and Greek) in place of the default Libertine letters. With this option, every math expression in the document will be rendered using sans serif letters.

libertinust1-mathsfrm (\mathsf)

	´0	´1	´2	´3	´4	´5	´6	´7	
´00x	Γ_0	Δ_1	Θ_2	Λ_3	Ξ_4	Π_5	Σ_6	Υ_7	"0x
´01x	Φ_8	Ψ_9	Ω_{10}	α_{11}	β_{12}	γ_{13}	δ_{14}	ϵ_{15}	
´02x	ζ_{16}	η_{17}	θ_{18}	ι_{19}	κ_{20}	λ_{21}	μ_{22}	ν_{23}	"1x
´03x	ξ_{24}	π_{25}	ρ_{26}	σ_{27}	τ_{28}	υ_{29}	ϕ_{30}	χ_{31}	
´04x	ψ_{32}	ω_{33}	ϵ_{34}	ϑ_{35}	ω_{36}	ϱ_{37}	ς_{38}	φ_{39}	"2x
´05x	∇_{40}	∂_{41}	$-_{42}$	$+_{43}$	\pm_{44}	\mp_{45}	$(_{46}$	$)_{47}$	
´06x	0_{48}	1_{49}	2_{50}	3_{51}	4_{52}	5_{53}	6_{54}	7_{55}	"3x
´07x	8_{56}	9_{57}	$:_{58}$	$;_{59}$	$*_{60}$	$=_{61}$	$\$_{62}$	$?_{63}$	
´10x	l_{64}	A_{65}	B_{66}	C_{67}	D_{68}	E_{69}	F_{70}	G_{71}	"4x
´11x	H_{72}	I_{73}	J_{74}	K_{75}	L_{76}	M_{77}	N_{78}	O_{79}	
´12x	P_{80}	Q_{81}	R_{82}	S_{83}	T_{84}	U_{85}	V_{86}	W_{87}	"5x
´13x	X_{88}	Y_{89}	Z_{90}	$[_{91}$	\backslash_{92}	$]_{93}$	$\{_{94}$	$/_{95}$	
´14x	$\}_96$	a_{97}	b_{98}	c_{99}	d_{100}	e_{101}	f_{102}	g_{103}	"6x
´15x	h_{104}	i_{105}	j_{106}	k_{107}	l_{108}	m_{109}	n_{110}	o_{111}	
´16x	p_{112}	q_{113}	r_{114}	s_{115}	t_{116}	u_{117}	v_{118}	w_{119}	"7x
´17x	x_{120}	y_{121}	z_{122}	l_{123}	j_{124}	$\#_{125}$	$\%_{126}$	$'_{127}$	
´20x	$\grave{ }_{128}$	$\acute{ }_{129}$	$\hat{ }_{130}$	$\tilde{ }_{131}$	$\bar{ }_{132}$	$\check{ }_{133}$	\cdot_{134}	$\ddot{ }_{135}$	"8x
´21x	$\overscript{ }_{136}$	$\overset{ }_{137}$	$\underscript{ }_{138}$	$\underset{ }_{139}$	$\underscript{ }_{140}$	$\overscript{ }_{141}$	$\underscript{ }_{142}$	$\overscript{ }_{143}$	
´22x	$\overleftarrow{ }_{144}$	$\overleftarrow{ }_{145}$	$\overrightarrow{ }_{146}$	$\overleftarrow{ }_{147}$	$\overleftarrow{ }_{148}$	$\overleftarrow{ }_{149}$	\lrcorner_{150}	\ulcorner_{151}	"9x
´23x	$*_{152}$	$\&_{153}$	$\@_{154}$	\neg_{155}	\cdot_{156}	\times_{157}	\leq_{158}	\div_{159}	
´24x	\mathbb{Z}_{160}	$\mathbb{1}_{161}$	$\mathbb{2}_{162}$	$\mathbb{3}_{163}$	$\mathbb{4}_{164}$	\bullet_{165}	\dots_{166}	\dots_{167}	"Ax
´25x	$\mathbb{1}_{168}$	$\mathbb{2}_{169}$	$\mathbb{3}_{170}$	$\mathbb{4}_{171}$	$\mathbb{5}_{172}$	$\mathbb{6}_{173}$	$\mathbb{7}_{174}$	$\mathbb{8}_{175}$	
´26x	$\mathbb{9}_{176}$	$\mathbb{0}_{177}$	$\mathbb{1}_{178}$	$\mathbb{2}_{179}$	$\mathbb{3}_{180}$	$\mathbb{4}_{181}$	$\mathbb{5}_{182}$	$\mathbb{6}_{183}$	"Bx
´27x	$\mathbb{7}_{184}$	$\mathbb{8}_{185}$	$\mathbb{9}_{186}$	$\mathbb{0}_{187}$	$\mathbb{1}_{188}$	$\mathbb{2}_{189}$	$\mathbb{3}_{190}$	$\mathbb{4}_{191}$	
´30x	$\mathbb{5}_{192}$	$\mathbb{6}_{193}$	$\mathbb{7}_{194}$	$\mathbb{8}_{195}$	$\mathbb{9}_{196}$	$\mathbb{0}_{197}$	$\mathbb{1}_{198}$	$\mathbb{2}_{199}$	"Cx
´31x	$\mathbb{3}_{200}$	$\mathbb{4}_{201}$	$\mathbb{5}_{202}$	$\mathbb{6}_{203}$	$\mathbb{7}_{204}$	$\mathbb{8}_{205}$	$\mathbb{9}_{206}$	$\mathbb{0}_{207}$	
´32x	$\mathbb{1}_{208}$	$\mathbb{2}_{209}$	$\mathbb{3}_{210}$	$\mathbb{4}_{211}$	$\mathbb{5}_{212}$	$\mathbb{6}_{213}$	$\mathbb{7}_{214}$	$\mathbb{8}_{215}$	"Dx
´33x	$\mathbb{9}_{216}$	$\mathbb{0}_{217}$	$\mathbb{1}_{218}$	$\mathbb{2}_{219}$	$\mathbb{3}_{220}$	$\mathbb{4}_{221}$	$\mathbb{5}_{222}$	$\mathbb{6}_{223}$	
´34x	$\mathbb{7}_{224}$	$\mathbb{8}_{225}$	$\mathbb{9}_{226}$	$\mathbb{0}_{227}$	$\mathbb{1}_{228}$	$\mathbb{2}_{229}$	$\mathbb{3}_{230}$	$\mathbb{4}_{231}$	"Ex
´35x	$\mathbb{5}_{232}$	$\mathbb{6}_{233}$	$\mathbb{7}_{234}$	$\mathbb{8}_{235}$	$\mathbb{9}_{236}$	$\mathbb{0}_{237}$	$\mathbb{1}_{238}$	$\mathbb{2}_{239}$	
´36x	$\mathbb{3}_{240}$	$\mathbb{4}_{241}$	$\mathbb{5}_{242}$	$\mathbb{6}_{243}$	$\mathbb{7}_{244}$	$\mathbb{8}_{245}$	$\mathbb{9}_{246}$	$\mathbb{0}_{247}$	"Fx
´37x	$\mathbb{1}_{248}$	$\mathbb{2}_{249}$	$\mathbb{3}_{250}$	$\mathbb{4}_{251}$	$\mathbb{5}_{252}$	$\mathbb{6}_{253}$	$\mathbb{7}_{254}$	$\mathbb{8}_{255}$	
	"8	"9	"A	"B	"C	"D	"E	"F	

libertinust1-mathsfrm-bold (\mathsfbf)

	´0	´1	´2	´3	´4	´5	´6	´7	
´00x	Γ_0	Δ_1	Θ_2	Λ_3	Ξ_4	Π_5	Σ_6	Υ_7	"0x
´01x	Φ_8	Ψ_9	Ω_{10}	α_{11}	β_{12}	γ_{13}	δ_{14}	ϵ_{15}	
´02x	ζ_{16}	η_{17}	θ_{18}	ι_{19}	κ_{20}	λ_{21}	μ_{22}	ν_{23}	"1x
´03x	ξ_{24}	π_{25}	ρ_{26}	σ_{27}	τ_{28}	υ_{29}	ϕ_{30}	χ_{31}	
´04x	ψ_{32}	ω_{33}	ϵ_{34}	δ_{35}	ϖ_{36}	ϱ_{37}	ς_{38}	φ_{39}	"2x
´05x	∇_{40}	∂_{41}	$-_{42}$	$+_{43}$	\pm_{44}	\mp_{45}	$(_{46}$	$)_{47}$	
´06x	0_{48}	1_{49}	2_{50}	3_{51}	4_{52}	5_{53}	6_{54}	7_{55}	"3x
´07x	8_{56}	9_{57}	$:_{58}$	$;_{59}$	$*_{60}$	$=_{61}$	$\$_{62}$	$?_{63}$	
´10x	$!_{64}$	A_{65}	B_{66}	C_{67}	D_{68}	E_{69}	F_{70}	G_{71}	"4x
´11x	H_{72}	I_{73}	J_{74}	K_{75}	L_{76}	M_{77}	N_{78}	O_{79}	
´12x	P_{80}	Q_{81}	R_{82}	S_{83}	T_{84}	U_{85}	V_{86}	W_{87}	"5x
´13x	X_{88}	Y_{89}	Z_{90}	$[_{91}$	\backslash_{92}	$]_{93}$	$\{_{94}$	$/_{95}$	
´14x	$\}_96$	a_{97}	b_{98}	c_{99}	d_{100}	e_{101}	f_{102}	g_{103}	"6x
´15x	h_{104}	i_{105}	j_{106}	k_{107}	l_{108}	m_{109}	n_{110}	o_{111}	
´16x	p_{112}	q_{113}	r_{114}	s_{115}	t_{116}	u_{117}	v_{118}	w_{119}	"7x
´17x	x_{120}	y_{121}	z_{122}	$!_{123}$	J_{124}	$\#_{125}$	$\%_{126}$	$'_{127}$	
´20x	$\grave{ }_{128}$	$\acute{ }_{129}$	$\hat{ }_{130}$	$\tilde{ }_{131}$	$\bar{ }_{132}$	$\check{ }_{133}$	\cdot_{134}	$\ddot{ }_{135}$	"8x
´21x	$\overscript{ }_{136}$	$\overset{ }_{137}$	$\underscript{ }_{138}$	$\underset{ }_{139}$	$\underscript{ }_{140}$	$\overscript{ }_{141}$	$\underscript{ }_{142}$	$\overscript{ }_{143}$	
´22x	$\overleftarrow{ }_{144}$	$\overrightarrow{ }_{145}$	$\overleftrightarrow{ }_{146}$	$\overlongleftarrow{ }_{147}$	$\overrightarrow{ }_{148}$	$\overleftrightarrow{ }_{149}$	\lrcorner_{150}	\ulcorner_{151}	"9x
´23x	$*_{152}$	$\&_{153}$	$\@_{154}$	\neg_{155}	\cdot_{156}	\times_{157}	\leq_{158}	\div_{159}	
´24x	Z_{160}	$\text{\textcircled{ } }_{161}$	$\text{\textcircled{ } }_{162}$	\textdagger_{163}	\textdagger_{164}	\bullet_{165}	\dots_{166}	\dots_{167}	"Ax
´25x	$/_{168}$	$//_{169}$	$///_{170}$	\backslash_{171}	$\backslash\backslash_{172}$	$\backslash\backslash\backslash_{173}$	$\text{\textasciitilde}_{174}$	$!!_{175}$	
´26x	$\text{\textcircled{ } }_{176}$	$/_{177}$	$??_{178}$	$_{179}$	$///_{180}$	$\text{\textcircled{ } }_{181}$	$_{182}$	$_{183}$	"Bx
´27x	\succ_{184}	$_{185}$	$\text{\textcircled{ } }_{186}$	$\text{\textcircled{ } }_{187}$	$_{188}$	$\text{\textcircled{ } }_{189}$	$\text{\textcircled{ } }_{190}$	$\text{\textcircled{ } }_{191}$	
´30x	\lrcorner_{192}	\lrcorner_{193}	\lrcorner_{194}	$_{195}$	$\text{\textcircled{ } }_{196}$	$\text{\textcircled{ } }_{197}$	$\text{\textcircled{ } }_{198}$	$\text{\textcircled{ } }_{199}$	"Cx
´31x	$\text{\textcircled{ } }_{200}$	$\text{\textcircled{ } }_{201}$	$\text{\textcircled{ } }_{202}$	$\text{\textcircled{ } }_{203}$	$\text{\textcircled{ } }_{204}$	$\text{\textcircled{ } }_{205}$	$\text{\textcircled{ } }_{206}$	$\text{\textcircled{ } }_{207}$	
´32x	$\text{\textcircled{ } }_{208}$	\blacksquare_{209}	\dagger_{210}	\geq_{211}	\setminus_{212}	\circ_{213}	\bullet_{214}	α_{215}	"Dx
´33x	∞_{216}	\perp_{217}	\angle_{218}	\sphericalangle_{219}	\sphericalangle_{220}	$ _{221}$	\dagger_{222}	\parallel_{223}	
´34x	\parallel_{224}	\wedge_{225}	\vee_{226}	\cap_{227}	\cup_{228}	\cdot_{229}	\cdot_{230}	\emptyset_{231}	"Ex
´35x	$\ddot{ }_{232}$	$\dot{ }_{233}$	$\dot{ }_{234}$	$\ddot{ }_{235}$	$\dot{ }_{236}$	\sim_{237}	\sim_{238}	∞_{239}	
´36x	\sim_{240}	\sim_{241}	\sim_{242}	\approx_{243}	\approx_{244}	\neq_{245}	\cong_{246}	\cong_{247}	"Fx
´37x	\neq_{248}	\approx_{249}	\neq_{250}	\cong_{251}	\cong_{252}	\cong_{253}	\times_{254}	\approx_{255}	
	"8	"9	"A	"B	"C	"D	"E	"F	

libertinust1-mathsfit (\mathsf{fit})

	´0	´1	´2	´3	´4	´5	´6	´7	
´00x	Γ_0	Δ_1	Θ_2	Λ_3	Ξ_4	Π_5	Σ_6	Υ_7	"0x
´01x	Φ_8	Ψ_9	Ω_{10}	α_{11}	β_{12}	γ_{13}	δ_{14}	ϵ_{15}	
´02x	ζ_{16}	η_{17}	θ_{18}	ι_{19}	κ_{20}	λ_{21}	μ_{22}	ν_{23}	"1x
´03x	ξ_{24}	π_{25}	ρ_{26}	σ_{27}	τ_{28}	υ_{29}	ϕ_{30}	χ_{31}	
´04x	ψ_{32}	ω_{33}	ε_{34}	ϑ_{35}	ϖ_{36}	ϱ_{37}	ς_{38}	φ_{39}	"2x
´05x	∇_{40}	∂_{41}	\aleph_{42}	\beth_{43}	\aleph_{44}	\beth_{45}	\triangleright_{46}	\triangleleft_{47}	
´06x	0_{48}	1_{49}	2_{50}	3_{51}	4_{52}	5_{53}	6_{54}	7_{55}	"3x
´07x	8_{56}	9_{57}	\cdot_{58}	\cdot_{59}	$<_{60}$	\hbar_{61}	$>_{62}$	\star_{63}	
´10x	\neq_{64}	A_{65}	B_{66}	C_{67}	D_{68}	E_{69}	F_{70}	G_{71}	"4x
´11x	H_{72}	I_{73}	J_{74}	K_{75}	L_{76}	M_{77}	N_{78}	O_{79}	
´12x	P_{80}	Q_{81}	R_{82}	S_{83}	T_{84}	U_{85}	V_{86}	W_{87}	"5x
´13x	X_{88}	Y_{89}	Z_{90}	b_{91}	$\#_{92}$	$\#_{93}$	\smile_{94}	\frown_{95}	
´14x	\hbar_{96}	a_{97}	b_{98}	c_{99}	d_{100}	e_{101}	f_{102}	g_{103}	"6x
´15x	h_{104}	i_{105}	j_{106}	k_{107}	l_{108}	m_{109}	n_{110}	o_{111}	
´16x	p_{112}	q_{113}	r_{114}	s_{115}	t_{116}	u_{117}	v_{118}	w_{119}	"7x
´17x	x_{120}	y_{121}	z_{122}	l_{123}	J_{124}	\neq_{125}	\ll_{126}	\frown_{127}	
´20x	$\grave{\cdot}_{128}$	$\acute{\cdot}_{129}$	$\hat{\cdot}_{130}$	$\tilde{\cdot}_{131}$	$\bar{\cdot}_{132}$	$\check{\cdot}_{133}$	\cdot_{134}	$\ddot{\cdot}_{135}$	"8x
´21x	$\overset{\cdot}{\cdot}_{136}$	$\overset{\circ}{\cdot}_{137}$	$\underset{\cdot}{\cdot}_{138}$	$\underset{\circ}{\cdot}_{139}$	$\overset{\cdot}{\cdot}_{140}$	$\overset{\circ}{\cdot}_{141}$	$\underset{\cdot}{\cdot}_{142}$	$\underset{\circ}{\cdot}_{143}$	
´22x	$\overleftarrow{\cdot}_{144}$	$\overleftarrow{\cdot}_{145}$	$\overrightarrow{\cdot}_{146}$	$\overrightarrow{\cdot}_{147}$	$\overleftrightarrow{\cdot}_{148}$	$\overleftrightarrow{\cdot}_{149}$	\lrcorner_{150}	\llcorner_{151}	"9x
´23x	\ast_{152}	$\bar{\cdot}_{153}$	$\hat{\cdot}_{154}$	$\tilde{\cdot}_{155}$	$\check{\cdot}_{156}$	\frown_{157}	\smile_{158}	\vee_{159}	
´24x	$\overbrace{\cdot}_{160}$	$\overbrace{\cdot}_{161}$	$\overbrace{\cdot}_{162}$	$\overbrace{\cdot}_{163}$	$\overbrace{\cdot}_{164}$	$\overbrace{\cdot}_{165}$	$\overbrace{\cdot}_{166}$	$\overbrace{\cdot}_{167}$	"Ax
´25x	$\underbrace{\cdot}_{168}$	$\underbrace{\cdot}_{169}$	$\underbrace{\cdot}_{170}$	$\underbrace{\cdot}_{171}$	$\underbrace{\cdot}_{172}$	$\underbrace{\cdot}_{173}$	$\underbrace{\cdot}_{174}$	$\underbrace{\cdot}_{175}$	
´26x	$\overleftarrow{\cdot}_{176}$	$\overleftarrow{\cdot}_{177}$	$\overleftarrow{\cdot}_{178}$	$\overleftarrow{\cdot}_{179}$	\lrcorner_{180}	\llcorner_{181}	\lrcorner_{182}	\llcorner_{183}	"Bx
´27x	\gg_{184}	\S_{185}	\neq_{186}	\lessgtr_{187}	\gtrless_{188}	\lessgtr_{189}	\gtrless_{190}	\lesseqgtr_{191}	
´30x	\gtrsim_{192}	\lessgtr_{193}	\gtrless_{194}	\lesseqgtr_{195}	\gtrsim_{196}	\lessgtr_{197}	\gtrless_{198}	\lessgtr_{199}	"Cx
´31x	\succ_{200}	\preceq_{201}	\succcurlyeq_{202}	\preceq_{203}	\succ_{204}	\neq_{205}	\neq_{206}	\subset_{207}	
´32x	\supset_{208}	\subsetneq_{209}	$\not\subset_{210}$	\subset_{211}	\supset_{212}	$\not\subset_{213}$	$\not\subset_{214}$	\subset_{215}	"Dx
´33x	\supsetneq_{216}	\supsetneq_{217}	\supsetneq_{218}	\supsetneq_{219}	\sqsubset_{220}	\sqsupset_{221}	\sqsubset_{222}	\sqsupset_{223}	
´34x	\sqcap_{224}	\sqcup_{225}	\oplus_{226}	\ominus_{227}	\otimes_{228}	\oslash_{229}	\odot_{230}	\odot_{231}	"Ex
´35x	\oplus_{232}	\ominus_{233}	\ominus_{234}	\boxplus_{235}	\boxminus_{236}	\boxtimes_{237}	\boxdiv_{238}	\vdash_{239}	
´36x	\dashv_{240}	\top_{241}	\perp_{242}	\vdash_{243}	\vDash_{244}	\vDash_{245}	\Vdash_{246}	\Vdash_{247}	"Fx
´37x	\Vdash_{248}	\Vdash_{249}	\neq_{250}	\neq_{251}	\neq_{252}	\neq_{253}	\times_{254}	\trianglelefteq_{255}	
	"8	"9	"A	"B	"C	"D	"E	"F	

libertinust1-mathsfit-bold (\mathsfbf)it)

	´0	´1	´2	´3	´4	´5	´6	´7	
´00x	Γ_0	Δ_1	Θ_2	Λ_3	Ξ_4	Π_5	Σ_6	Υ_7	"0x
´01x	Φ_8	Ψ_9	Ω_{10}	α_{11}	β_{12}	γ_{13}	δ_{14}	ϵ_{15}	
´02x	ζ_{16}	η_{17}	θ_{18}	ι_{19}	κ_{20}	λ_{21}	μ_{22}	ν_{23}	"1x
´03x	ξ_{24}	π_{25}	ρ_{26}	σ_{27}	τ_{28}	υ_{29}	ϕ_{30}	χ_{31}	
´04x	ψ_{32}	ω_{33}	ϵ_{34}	δ_{35}	ϖ_{36}	ϱ_{37}	ς_{38}	φ_{39}	"2x
´05x	∇_{40}	∂_{41}	\aleph_{42}	\beth_{43}	λ_{44}	\daleth_{45}	\triangleright_{46}	\triangleleft_{47}	
´06x	0_{48}	1_{49}	2_{50}	3_{51}	4_{52}	5_{53}	6_{54}	7_{55}	"3x
´07x	8_{56}	9_{57}	\cdot_{58}	\cdot_{59}	$<_{60}$	\hbar_{61}	$>_{62}$	\star_{63}	
´10x	\neq_{64}	A_{65}	B_{66}	C_{67}	D_{68}	E_{69}	F_{70}	G_{71}	"4x
´11x	H_{72}	I_{73}	J_{74}	K_{75}	L_{76}	M_{77}	N_{78}	O_{79}	
´12x	P_{80}	Q_{81}	R_{82}	S_{83}	T_{84}	U_{85}	V_{86}	W_{87}	"5x
´13x	X_{88}	Y_{89}	Z_{90}	b_{91}	\hbar_{92}	$\#_{93}$	\smile_{94}	\frown_{95}	
´14x	\hbar_{96}	a_{97}	b_{98}	c_{99}	d_{100}	e_{101}	f_{102}	g_{103}	"6x
´15x	h_{104}	i_{105}	j_{106}	k_{107}	l_{108}	m_{109}	n_{110}	o_{111}	
´16x	p_{112}	q_{113}	r_{114}	s_{115}	t_{116}	u_{117}	v_{118}	w_{119}	"7x
´17x	x_{120}	y_{121}	z_{122}	l_{123}	J_{124}	\neq_{125}	\ll_{126}	\frown_{127}	
´20x	$\grave{\text{a}}_{128}$	$\acute{\text{a}}_{129}$	$\hat{\text{a}}_{130}$	$\tilde{\text{a}}_{131}$	$\bar{\text{a}}_{132}$	$\check{\text{a}}_{133}$	$\dot{\text{a}}_{134}$	$\ddot{\text{a}}_{135}$	"8x
´21x	$\overset{\circ}{\text{a}}_{136}$	$\overset{\circ}{\text{a}}_{137}$	$\underset{\vee}{\text{a}}_{138}$	$\underset{\smile}{\text{a}}_{139}$	$\underset{\smile}{\text{a}}_{140}$	$\underset{\smile}{\text{a}}_{141}$	$\underset{\smile}{\text{a}}_{142}$	$\underset{\smile}{\text{a}}_{143}$	
´22x	$\overleftarrow{\text{a}}_{144}$	$\overleftarrow{\text{a}}_{145}$	$\overrightarrow{\text{a}}_{146}$	$\overrightarrow{\text{a}}_{147}$	$\overrightarrow{\text{a}}_{148}$	$\overleftrightarrow{\text{a}}_{149}$	\lrcorner_{150}	\llcorner_{151}	"9x
´23x	\ast_{152}	$\bar{\text{a}}_{153}$	$\hat{\text{a}}_{154}$	$\tilde{\text{a}}_{155}$	$\underset{\vee}{\text{a}}_{156}$	$\underset{\smile}{\text{a}}_{157}$	$\underset{\smile}{\text{a}}_{158}$	$\underset{\smile}{\text{a}}_{159}$	
´24x	$\overbrace{\text{a}}_{160}$	$\overbrace{\text{a}}_{161}$	$\overbrace{\text{a}}_{162}$	$\overbrace{\text{a}}_{163}$	$\overbrace{\text{a}}_{164}$	$\overbrace{\text{a}}_{165}$	$\overbrace{\text{a}}_{166}$	$\overbrace{\text{a}}_{167}$	"Ax
´25x	$\overbrace{\text{a}}_{168}$	$\overbrace{\text{a}}_{169}$	$\overbrace{\text{a}}_{170}$	$\overbrace{\text{a}}_{171}$	$\overbrace{\text{a}}_{172}$	$\overbrace{\text{a}}_{173}$	$\overbrace{\text{a}}_{174}$	$\overbrace{\text{a}}_{175}$	
´26x	$\overbrace{\text{a}}_{176}$	$\overbrace{\text{a}}_{177}$	$\overbrace{\text{a}}_{178}$	$\overbrace{\text{a}}_{179}$	$\overbrace{\text{a}}_{180}$	$\overbrace{\text{a}}_{181}$	$\overbrace{\text{a}}_{182}$	$\overbrace{\text{a}}_{183}$	"Bx
´27x	\gg_{184}	\gtrsim_{185}	\nlessgtr_{186}	\lessgtr_{187}	\gtrless_{188}	\lessgtr_{189}	\gtrless_{190}	\lesseqgtr_{191}	
´30x	\gtrsim_{192}	\lessgtr_{193}	\lessgtr_{194}	\lesseqgtr_{195}	\gtrless_{196}	\lessgtr_{197}	\gtrless_{198}	\lessgtr_{199}	"Cx
´31x	\succ_{200}	\preceq_{201}	\succcurlyeq_{202}	\preceq_{203}	\succcurlyeq_{204}	\succcurlyeq_{205}	\succcurlyeq_{206}	\subset_{207}	
´32x	\supset_{208}	\subsetneq_{209}	$\not\subset_{210}$	\subseteq_{211}	\supseteq_{212}	$\not\subseteq_{213}$	$\not\subseteq_{214}$	\subsetneq_{215}	"Dx
´33x	\supseteq_{216}	\supsetneq_{217}	\supsetneq_{218}	\supsetneq_{219}	\sqsubset_{220}	\sqsupset_{221}	\sqsubset_{222}	\sqsupset_{223}	
´34x	\sqcap_{224}	\sqcup_{225}	\oplus_{226}	\ominus_{227}	\otimes_{228}	\oslash_{229}	\odot_{230}	\odot_{231}	"Ex
´35x	\otimes_{232}	\ominus_{233}	\ominus_{234}	\oplus_{235}	\oplus_{236}	\boxtimes_{237}	\square_{238}	\vdash_{239}	
´36x	\dashv_{240}	\top_{241}	\perp_{242}	\vdash_{243}	\vDash_{244}	\vDash_{245}	\vDash_{246}	\vDash_{247}	"Fx
´37x	\vDash_{248}	\vDash_{249}	\vDash_{250}	\vDash_{251}	\vDash_{252}	\vDash_{253}	\vDash_{254}	\vDash_{255}	
	"8	"9	"A	"B	"C	"D	"E	"F	

Brief samples using the sans serif options, showing mathgroup usage

1.

Options=[], and no use of \mathsfxxxx macros.

$$y = f(x).$$

*** Mathgroups ***

```
(0: \LS1/libertinust1math/m/n/12 = libertinust1-mathrm at 14.39996pt [operators])
(1: \LS1/libertinust1math/m/it/12 = libertinust1-mathit at 14.39996pt [letters])
(2: \LS2/libertinust1mathsym/m/n/12 = libertinust1-mathsym at 14.39996pt [symbols])
(3: \LS2/libertinust1mathex/m/n/12 = libertinust1-mathex at 14.39996pt [largesymbols])
(4: \LS1/libertinust1mathbb/m/n/12 = libertinust1-mathbb at 14.39996pt [symbolsbb])
(5: \LS1/libertinust1math/b/n/12 = libertinust1-mathrm-bold at 14.39996pt [bold-operators])
(6: \LS1/libertinust1math/b/it/12 = libertinust1-mathit-bold at 14.39996pt [bold-letters])
```

2.

Options=[]

macro	symbol
\mathsf{x}	x
\mathsfbf{y}	y
\mathsfbfit{z}	z
\mathsfit{w}	undefined

*** Mathgroups ***

```
(0: \LS1/libertinust1math/m/n/12 = libertinust1-mathrm at 14.39996pt [operators])
(1: \LS1/libertinust1math/m/it/12 = libertinust1-mathit at 14.39996pt [letters])
(2: \LS2/libertinust1mathsym/m/n/12 = libertinust1-mathsym at 14.39996pt [symbols])
(3: \LS2/libertinust1mathex/m/n/12 = libertinust1-mathex at 14.39996pt [largesymbols])
(4: \LS1/libertinust1mathbb/m/n/12 = libertinust1-mathbb at 14.39996pt [symbolsbb])
(5: \LS1/libertinust1math/b/n/12 = libertinust1-mathrm-bold at 14.39996pt [bold-operators])
(6: \LS1/libertinust1math/b/it/12 = libertinust1-mathit-bold at 14.39996pt [bold-letters])
(7: \LS1/libertinust1mathsf/m/n/12 = libertinust1-mathsfrm at 14.39996pt)
(8: \LS1/libertinust1mathsf/b/n/12 = libertinust1-mathsfrm-bold at 14.39996pt)
(9: \LS1/libertinust1mathsf/b/it/12 = libertinust1-mathsfit-bold at 14.39996pt)
```

3.

Options=[nosans], and no use of \mathsfxxxx macros.

$$y = f(x).$$

*** Mathgroups ***

```
(0: \LS1/libertinust1math/m/n/12 = libertinust1-mathrm at 14.39996pt [operators])
(1: \LS1/libertinust1math/m/it/12 = libertinust1-mathit at 14.39996pt [letters])
(2: \LS2/libertinust1mathsym/m/n/12 = libertinust1-mathsym at 14.39996pt [symbols])
(3: \LS2/libertinust1mathex/m/n/12 = libertinust1-mathex at 14.39996pt [largesymbols])
```

(4: \LS1/libertinust1mathbb/m/n/12 = libertinust1-mathbb at 14.39996pt [symbolsbb])
 (5: \LS1/libertinust1math/b/n/12 = libertinust1-mathrm-bold at 14.39996pt [bold-operators])
 (6: \LS1/libertinust1math/b/it/12 = libertinust1-mathit-bold at 14.39996pt [bold-letters])

4.

Options=[nosans], and no use of \mathsfxxxx macros

macro	symbol
\mathsf{x}	x
\mathsfbf{y}	y
\mathsfbfit{z}	undefined
\mathsfit{w}	undefined

*** Mathgroups ***

(0: \LS1/libertinust1math/m/n/12 = libertinust1-mathrm at 14.39996pt [operators])
 (1: \LS1/libertinust1math/m/it/12 = libertinust1-mathit at 14.39996pt [letters])
 (2: \LS2/libertinust1mathsym/m/n/12 = libertinust1-mathsym at 14.39996pt [symbols])
 (3: \LS2/libertinust1mathex/m/n/12 = libertinust1-mathex at 14.39996pt [largesymbols])
 (4: \LS1/libertinust1mathbb/m/n/12 = libertinust1-mathbb at 14.39996pt [symbolsbb])
 (5: \LS1/libertinust1math/b/n/12 = libertinust1-mathrm-bold at 14.39996pt [bold-operators])
 (6: \LS1/libertinust1math/b/it/12 = libertinust1-mathit-bold at 14.39996pt [bold-letters])
 (7: \LS1/libertinust1mathsf/m/n/12 = libertinust1-mathsfrm at 14.39996pt)
 (8: \LS1/libertinust1mathsf/b/n/12 = libertinust1-mathsfrm-bold at 14.39996pt)

5.

Options=[mathsfit], and no use of \mathsfxxxx macros.

$$y = f(x).$$

*** Mathgroups ***

(0: \LS1/libertinust1math/m/n/12 = libertinust1-mathrm at 14.39996pt [operators])
 (1: \LS1/libertinust1math/m/it/12 = libertinust1-mathit at 14.39996pt [letters])
 (2: \LS2/libertinust1mathsym/m/n/12 = libertinust1-mathsym at 14.39996pt [symbols])
 (3: \LS2/libertinust1mathex/m/n/12 = libertinust1-mathex at 14.39996pt [largesymbols])
 (4: \LS1/libertinust1mathbb/m/n/12 = libertinust1-mathbb at 14.39996pt [symbolsbb])
 (5: \LS1/libertinust1math/b/n/12 = libertinust1-mathrm-bold at 14.39996pt [bold-operators])
 (6: \LS1/libertinust1math/b/it/12 = libertinust1-mathit-bold at 14.39996pt [bold-letters])

6.

Options=[mathsfit]

macro	symbol
\mathsf{x}	x
\mathsfbf{y}	y
\mathsfbfit{z}	z
\mathsfit{w}	w

*** Mathgroups ***

(0: \LS1/libertinust1math/m/n/12 = libertinust1-mathrm at 14.39996pt [operators])
(1: \LS1/libertinust1math/m/it/12 = libertinust1-mathit at 14.39996pt [letters])
(2: \LS2/libertinust1mathsym/m/n/12 = libertinust1-mathsym at 14.39996pt [symbols])
(3: \LS2/libertinust1mathex/m/n/12 = libertinust1-mathex at 14.39996pt [largesymbols])
(4: \LS1/libertinust1mathbb/m/n/12 = libertinust1-mathbb at 14.39996pt [symbolsbb])
(5: \LS1/libertinust1math/b/n/12 = libertinust1-mathrm-bold at 14.39996pt [bold-operators])
(6: \LS1/libertinust1math/b/it/12 = libertinust1-mathit-bold at 14.39996pt [bold-letters])
(7: \LS1/libertinust1mathsf/m/n/12 = libertinust1-mathsfrm at 14.39996pt)
(8: \LS1/libertinust1mathsf/b/n/12 = libertinust1-mathsfrm-bold at 14.39996pt)
(9: \LS1/libertinust1mathsf/b/it/12 = libertinust1-mathsfit-bold at 14.39996pt)
(10: \LS1/libertinust1mathsf/m/it/12 = libertinust1-mathsfit at 14.39996pt)

7.

Options=[reuseMathAlphabets]

macro	symbol
<code>\mathsf{x}</code>	x
<code>\mathsfbf{y}</code>	y
<code>\mathsfbfit{z}</code>	z
<code>\mathsfit{w}</code>	undefined

*** Mathgroups ***

(0: \LS1/libertinust1math/m/n/12 = libertinust1-mathrm at 14.39996pt [operators])
(1: \LS1/libertinust1math/m/it/12 = libertinust1-mathit at 14.39996pt [letters])
(2: \LS2/libertinust1mathsym/m/n/12 = libertinust1-mathsym at 14.39996pt [symbols])
(3: \LS2/libertinust1mathex/m/n/12 = libertinust1-mathex at 14.39996pt [largesymbols])
(4: \LS1/libertinust1mathbb/m/n/12 = libertinust1-mathbb at 14.39996pt [symbolsbb])
(5: \LS1/libertinust1math/b/n/12 = libertinust1-mathrm-bold at 14.39996pt [bold-operators])
(6: \LS1/libertinust1math/b/it/12 = libertinust1-mathit-bold at 14.39996pt [bold-letters])
(7: \LS1/libertinust1mathsf/m/n/12 = libertinust1-mathsfrm at 14.39996pt)
(8: \LS1/libertinust1mathsf/b/n/12 = libertinust1-mathsfrm-bold at 14.39996pt)
(9: \LS1/libertinust1mathsf/b/it/12 = libertinust1-mathsfit-bold at 14.39996pt)

8.

Options=[ISO]

macro	symbol
<code>\mathsf{x}</code>	x
<code>\mathsfbf{y}</code>	y
<code>\mathsfbfit{z}</code>	z
<code>\mathsfit{w}</code>	undefined

*** Mathgroups ***

(0: \LS1/libertinust1math/m/n/12 = libertinust1-mathrm at 14.39996pt [operators])
(1: \LS1/libertinust1math/m/it/12 = libertinust1-mathit at 14.39996pt [letters])
(2: \LS2/libertinust1mathsym/m/n/12 = libertinust1-mathsym at 14.39996pt [symbols])

- (3: \LS2/libertinust1mathex/m/n/12 = libertinust1-mathex at 14.39996pt [largesymbols])
 - (4: \LS1/libertinust1mathbb/m/n/12 = libertinust1-mathbb at 14.39996pt [symbolsbb])
 - (5: \LS1/libertinust1math/b/n/12 = libertinust1-mathrm-bold at 14.39996pt [bold-operators])
 - (6: \LS1/libertinust1math/b/it/12 = libertinust1-mathit-bold at 14.39996pt [bold-letters])
 - (7: \LS1/libertinust1mathsf/m/n/12 = libertinust1-mathsfrm at 14.39996pt)
 - (8: \LS1/libertinust1mathsf/b/n/12 = libertinust1-mathsfrm-bold at 14.39996pt)
 - (9: \LS1/libertinust1mathsf/b/it/12 = libertinust1-mathsfit-bold at 14.39996pt)
-

9.

Options=[ISO,mathsf]

macro	symbol
<code>\mathsf{x}</code>	x
<code>\mathsfbf{y}</code>	y
<code>\mathsfbfit{z}</code>	z
<code>\mathsfit{w}</code>	w

*** Mathgroups ***

- (0: \LS1/libertinust1math/m/n/12 = libertinust1-mathrm at 14.39996pt [operators])
 - (1: \LS1/libertinust1math/m/it/12 = libertinust1-mathit at 14.39996pt [letters])
 - (2: \LS2/libertinust1mathsym/m/n/12 = libertinust1-mathsym at 14.39996pt [symbols])
 - (3: \LS2/libertinust1mathex/m/n/12 = libertinust1-mathex at 14.39996pt [largesymbols])
 - (4: \LS1/libertinust1mathbb/m/n/12 = libertinust1-mathbb at 14.39996pt [symbolsbb])
 - (5: \LS1/libertinust1math/b/n/12 = libertinust1-mathrm-bold at 14.39996pt [bold-operators])
 - (6: \LS1/libertinust1math/b/it/12 = libertinust1-mathit-bold at 14.39996pt [bold-letters])
 - (7: \LS1/libertinust1mathsf/m/n/12 = libertinust1-mathsfrm at 14.39996pt)
 - (8: \LS1/libertinust1mathsf/b/n/12 = libertinust1-mathsfrm-bold at 14.39996pt)
 - (9: \LS1/libertinust1mathsf/b/it/12 = libertinust1-mathsfit-bold at 14.39996pt)
 - (10: \LS1/libertinust1mathsf/m/it/12 = libertinust1-mathsfit at 14.39996pt)
-

10.

Options=[ISO,mathsfit,reuseMathAlphabets]

macro	symbol
<code>\mathbf{y}</code>	y
<code>\mathsf{x}</code>	x
<code>\mathsfbf{y}</code>	y
<code>\mathsfbfit{z}</code>	z
<code>\mathsfit{w}</code>	w

*** Mathgroups ***

- (0: \LS1/libertinust1math/m/n/12 = libertinust1-mathrm at 14.39996pt [operators])
- (1: \LS1/libertinust1math/m/it/12 = libertinust1-mathit at 14.39996pt [letters])
- (2: \LS2/libertinust1mathsym/m/n/12 = libertinust1-mathsym at 14.39996pt [symbols])
- (3: \LS2/libertinust1mathex/m/n/12 = libertinust1-mathex at 14.39996pt [largesymbols])
- (4: \LS1/libertinust1mathbb/m/n/12 = libertinust1-mathbb at 14.39996pt [symbolsbb])
- (5: \LS1/libertinust1math/b/n/12 = libertinust1-mathrm-bold at 14.39996pt [bold-operators])

(6: \LS1/libertinust1math/b/it/12 = libertinust1-mathit-bold at 14.39996pt [bold-letters])
(7: \LS1/libertinust1mathsf/b/n/12 = libertinust1-mathsfm-bold at 14.39996pt)
(8: \LS1/libertinust1mathsf/b/it/12 = libertinust1-mathsfm-bold at 14.39996pt)
(9: \LS1/libertinust1mathsf/m/it/12 = libertinust1-mathsfm at 14.39996pt)

11: An example of sansmath.

Options=[sansmath]

The boundedness of Φ_0 then yields

$$\int_D |\bar{\partial}u|^2 e^{\alpha|z|^2} \geq c_6 \alpha \int_D |u|^2 e^{\alpha|z|^2} + c_7 \delta^{-2} \int_A |u|^2 e^{\alpha|z|^2}.$$

Let $B(X)$ be the set of blocks of Λ_X and let $b(X) := |B(X)|$. If $\varphi \in Q_X$ then φ is constant on the blocks of Λ_X .

$$P_X = \{\varphi \in M \mid \Lambda_\varphi = \Lambda_X\}, \quad Q_X = \{\varphi \in M \mid \Lambda_\varphi \geq \Lambda_X\}. \quad (1)$$

If $\Lambda_\varphi \geq \Lambda_X$ then $\Lambda_\varphi = \Lambda_Y$ for some $Y \geq X$ so that

$$Q_X = \bigcup_{Y \geq X} P_Y.$$

Thus by Möbius inversion

$$P_Y = \sum_{X \geq Y} \mu(Y, X) Q_X.$$

Thus there is a bijection from Q_X to $W^{B(X)}$. In particular $|Q_X| = w^{b(X)}$.

*** Mathgroups ***

(0: \LS1/libertinust1math/m/n/12 = libertinust1-mathsfm at 14.39996pt [operators])
(1: \LS1/libertinust1math/m/it/12 = libertinust1-mathsfm at 14.39996pt [letters])
(2: \LS2/libertinust1mathsym/m/n/12 = libertinust1-mathsym at 14.39996pt [symbols])
(3: \LS2/libertinust1mathex/m/n/12 = libertinust1-mathex at 14.39996pt [largesymbols])
(4: \LS1/libertinust1mathbb/m/n/12 = libertinust1-mathbb at 14.39996pt [symbolsbb])
(5: \LS1/libertinust1math/b/n/12 = libertinust1-mathsfm-bold at 14.39996pt [bold-operators])
(6: \LS1/libertinust1math/b/it/12 = libertinust1-mathsfm-bold at 14.39996pt [bold-letters])
