

The lua-unicode-math package*

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<https://github.com/zauguin/lua-unicode-math>

September 14, 2026

Modern fonts are usually provided in OpenType format and are designed for Unicode based input. For mathematical fonts this usually means the use of fonts with an OpenType MATH table: Fonts containing special metadata needed to make them usable in a mathematical context.

In LuaTeX such fonts have traditionally been loaded with the `unicode-math` package. While this works, is very flexible and allows to use the same document in XeTeX and LuaTeX it has performance issues and it sometimes has unexpected interactions with the use of math versions. The `lua-unicode-math` is a specific LuaLaTeX specific alternative which aims for higher performance and better integration with native LuaTeX features.

1 Usage instructions

1.1 Font packages

For most Opentype the recommended way to load them with `lua-unicode-math` is to use a dedicated package. Currently the following packages are shipped with `lua-unicode-math`:

*This document corresponds to `lua-unicode-math` v0.11, dated 2026-09-14.

Font	Package
Latin Modern Math	lum-lmodern
New Computer Modern Math	lum-newcomputermodern
New Computer Modern Sans Math	lum-newcomputermodernsans
STIX2	lum-stix2
XITS	lum-xits
TeX Gyre Pagella Math	lum-pagella
TeX Gyre DejaVu Math	lum-dejavu
TeX Gyre Bonum Math	lum-bonum
TeX Gyre Schola Math	lum-schola
TeX Gyre Termes Math	lum-termes
Fira Math	lum-fira
GFS Neohellenic Math	lum-gfsneohellenic
Erewhon Math	lum-erewhon
XCharter Math	lum-xcharter
Concrete Math	lum-concrete
Euler Math	lum-euler
Arsenal Math	lum-arsenal
Asana Math	lum-asana
Garamond Math	lum-garamond
Lete Sans Math	lum-lete-sans
Luciole Math	lum-luciole
Old Standard Math	lum-oldstandard
IBM Plex Math	lum-plex
Libertinus Math	lum-libertinus
KpMath Sans	lum-kpmath-sans

1.2 Loading fonts by name

If you want to use a custom font, you can load `fontspec` and `lua-unicode-math` using

```
\usepackage{fontspec, lua-unicode-math}
```

This will load **Latin Modern Math** by default. Another math font can be loaded using `\setmathfont` using the same options as `fontspec`'s `\newfontfamily`. Be aware that this does not support additional options supported by `unicode-math`, especially `version`, `range`, `s[s]cript-features`, `s[s]cript-font`. For example, you can use to to configure the current math font using

```
\setmathfont[AutoFakeBold=1]{Latin Modern Math}
```

Sometimes you might want to use different math fonts in the same document. This can be done by defining multiple math versions. In order to do this with a `fontspec` compatible interface use

```
\setmathfontversion{special-version}{XITS Math}
```

Afterwards in the document you can switch to the new math font using

```
\mathversion{special-version}
```

1.3 Writing maths

There are two ways of entering math: You can directly input Unicode math symbols or use regular L^AT_EX commands for symbols. All Unicode symbols are supported with the same commands as in `unicode-math`. For a full list see `texdoc unimath-symbols`.

1.4 Selecting math style

Selecting math style is considered experimental and the interface is not stable.

The `unicode-math` package allows to configure a math style through package options. It is used to configure which characters are upright or italic in the default math alphabet (). To configure similar settings in `lua-unicode-math`, you can select an instance of the `lua-unicode-math-style` template.

There are four supported styles:

TeX Attempt to be compatible with traditional T_EX conventions. This is the default. Everything is italic by default except for capital greek letters which are upright.

ISO80000-2 Attempt to be compliant with ISO 80000-2 rules. Everything is italic.

french Latin lowercase is italic, everything else is upright.

upright Everything is upright.

One of the styles can be selected by running `\UseInstance{lua-unicode-math-style}{style}` in your preamble, e.g.

```
\UseInstance{lua-unicode-math-style}{ISO80000-2}
```

2 Implementation

```
1 \ProvidesExplPackage
2   {lua-unicode-math}
3   {2026-09-14}
4   {0.11}
5   {Opentype Math support for LuaLaTeX}
6
7 <@@=l_uni_math>
8 \tl_new:N \l__l_uni_math_main_family_tl
9 \tl_new:N \l__l_uni_math_script_family_tl
10 \tl_new:N \l__l_uni_math_scriptscript_family_tl
11
12 \cs_generate_variant:Nn \tl_if_eq:nnT {o}
13
14 \msg_new:nnn { lua-unicode-math } { engine-unsupported } {
15   lua-unicode-math-can-only-be-used-with-LuaTeX.
16 }
17
18 \sys_if_engine luatex:F {
19   \msg_critical:nn { lua-unicode-math } { engine-unsupported }
20 }
21
22 \msg_new:nnn { lua-unicode-math } { unicode-math-suppressed } {
23   You-tried-to-load-both-lua-unicode-math-and-unicode-math-
```

```

24   in~the~same~document.~This~is~not~supported,~unicode-math~
25   will~be~suppressed.~There~is~a~good~chance~that~this~will~
26   break~your~document.~Change~your~document~to~only~use~lua-unicode-math~
27   so~solve~this.
28 }
29 \msg_new:nnn { lua-unicode-math } { unicode-math-loaded } {
30   You~tried~to~load~lua-unicode-math~while~unicode-math~
31   was~already~loaded.~This~does~not~work.~Please~avoid~loading~
32   unicode-math.~If~that~is~not~possible~and~you~are~feeling~adventurous~
33   you~can~try~loading~the~lua-unicode-math~package~at~the~beginning~
34   of~your~document~instead~to~suppress~unicode-math.
35 }
36 \declare@file@substitution{amssymb.sty}{lua-unicode-math--amssymb.sty}
37 \declare@file@substitution{amsfonts.sty}{lua-unicode-math--amsfonts.sty}
38 \disable@package@load{unicode-math} {
39   \msg_warning:nn { lua-unicode-math } {unicode-math-suppressed }
40 }
41 \IfPackageLoadedTF {unicode-math} {
42   \msg_critical:nn { lua-unicode-math } {unicode-math-loaded }
43 } {}
44
45
46 \hook_gput_code:nnn { package/fontspect/after } { . } {
47   \bool_gset_false:N \g__fontspec_math_bool
48
49   \NewDocumentCommand \setmathfont { O{} m O{} } { {
50     \setfontfamily
51       \g__l_uni_math_font_text_font
52       { #2 }
53       [ #1, #3, Script = Math, Renderer = Base ]
54     \tl_set_eq:NN \l__l_uni_math_main_family_tl \l_fontspec_family_tl
55
56     \setfontfamily
57       \g__l_uni_math_font_script_font
58       { #2 }
59       [ #1, #3, Script = Math, Renderer = Base, Style = MathScript ]
60     \tl_set_eq:NN \l__l_uni_math_script_family_tl \l_fontspec_family_tl
61
62     \setfontfamily
63       \g__l_uni_math_font_scriptscript_font
64       { #2 }
65       [ #1, #3, Script = Math, Renderer = Base, Style = MathScriptScript ]
66     \tl_set_eq:NN \l__l_uni_math_scriptscript_family_tl \l_fontspec_family_tl
67
68     \DeclareMathScriptfontMapping {TU} {\l__l_uni_math_main_family_tl} {TU} {\l__l_uni_math_s
69
70     \exp_args:NnnV \DeclareSymbolFont {lummain} {TU} \l__l_uni_math_main_family_tl {m} {n}
71     \exp_args:NnnV \SetSymbolFont {lummain} {bold} {TU} \l__l_uni_math_main_family_tl {b} {n}
72   }
73
74   \NewDocumentCommand \setmathfontversion { m O{} m O{} } { {
75     \exp_args:Nne \tl_if_in:NnF \version@list { \exp_not:c { mv@ #1 } } {
76       \DeclareMathVersion { #1 }
77     }

```

```

78
79 \setfontface
80 \g__l__uni_math_font_text_font
81 { #3 }
82 [ #2, #4, Script = Math, Renderer = Base ]
83 \tl_set_eq:NN \l__l__uni_math_main_family_tl \l_fontspec_family_tl
84
85 \setfontface
86 \g__l__uni_math_font_script_font
87 { #3 }
88 [ #2, #4, Script = Math, Renderer = Base, Style = MathScript ]
89 \tl_set_eq:NN \l__l__uni_math_script_family_tl \l_fontspec_family_tl
90
91 \setfontface
92 \g__l__uni_math_font_scriptscript_font
93 { #3 }
94 [ #2, #4, Script = Math, Renderer = Base, Style = MathScriptScript ]
95 \tl_set_eq:NN \l__l__uni_math_scriptscript_family_tl \l_fontspec_family_tl
96
97 \DeclareMathScriptfontMapping {TU} {\l__l__uni_math_main_family_tl} {TU} {\l__l__uni_math_s
98
99 \exp_args:NnnV \SetSymbolFont {lummain} {#1} {TU} \l__l__uni_math_main_family_tl {m} {n}
100 }
101
102 \cs_set:Nn \__fontspec_setmainfont_hook:nn
103 {
104 \tl_if_eq:onT {\g__fontspec_mathrm_tl} {\rmdefault}
105 {
106 \fontspec_gset_family:Nnn \g__fontspec_mathrm_tl {Renderer=Basic,#1} {#2}
107 \__fontspec_setmathrm_hook:nn {#1} {#2}
108 }
109 }
110 \cs_set:Nn \__fontspec_setsansfont_hook:nn
111 {
112 \tl_if_eq:onT {\g__fontspec_mathsf_tl} {\sfdefault}
113 {
114 \fontspec_gset_family:Nnn \g__fontspec_mathsf_tl {Renderer=Basic,#1} {#2}
115 \__fontspec_setmathsf_hook:nn {#1} {#2}
116 }
117 }
118 \cs_set:Nn \__fontspec_setmonofont_hook:nn
119 {
120 \tl_if_eq:onT {\g__fontspec_mathtt_tl} {\ttdefault}
121 {
122 \fontspec_gset_family:Nnn \g__fontspec_mathtt_tl {Renderer=Basic,#1} {#2}
123 \__fontspec_setmathtt_hook:nn {#1} {#2}
124 }
125 }
126 \cs_set:Nn \__fontspec_setmathrm_hook:nn
127 {
128 \SetMathAlphabet \mathrm { normal } \g__fontspec_encoding_tl \g__fontspec_mathrm_tl { \m
129 \SetMathAlphabet \mathit { normal } \g__fontspec_encoding_tl \g__fontspec_mathrm_tl { \m
130 \SetMathAlphabet \mathbf { normal } \g__fontspec_encoding_tl \g__fontspec_mathrm_tl { \b
131 }

```

```

132 \cs_set:Nn \__fontspec_setboldmathrm_hook:nn
133 {
134   \SetMathAlphabet \mathrm { bold } \g_fontspec_encoding_tl \g_fontspec_bfmathrm_tl { \m
135   \SetMathAlphabet \mathit { bold } \g_fontspec_encoding_tl \g_fontspec_bfmathrm_tl { \m
136   \SetMathAlphabet \mathbf { bold } \g_fontspec_encoding_tl \g_fontspec_bfmathrm_tl { \b
137 }
138 \cs_set:Nn \__fontspec_setmathsf_hook:nn
139 {
140   \SetMathAlphabet \mathsf { normal } \g_fontspec_encoding_tl \g_fontspec_mathsf_tl { \m
141   \SetMathAlphabet \mathsf { bold } \g_fontspec_encoding_tl \g_fontspec_mathsf_tl { \bfs
142 }
143 \cs_set:Nn \__fontspec_setmathtt_hook:nn
144 {
145   \SetMathAlphabet \mathtt { normal } \g_fontspec_encoding_tl \g_fontspec_mathtt_tl { \m
146   \SetMathAlphabet \mathtt { bold } \g_fontspec_encoding_tl \g_fontspec_mathtt_tl { \bfs
147 }
148 %
149 \__fontspec_setmathrm_hook:nn {} {}
150 \__fontspec_setmathsf_hook:nn {} {}
151 \__fontspec_setmathtt_hook:nn {} {}
152 }
153
154 \cs_set_protected:Npn \operator@font {
155   \@fontswitch { \font@warning{Math-mode-required-for-\string\operator@font.} } { \mathtextrm
156 }
157
158 \DeclareSymbolFont {lummy} {TU} {lmm} {m} {n}
159 \SetSymbolFont {lummy} {bold} {TU} {lmm} {b} {n}
160
161 \newattribute \mathfamattr
162
163 \cs_if_exist:NF \slimits@ {
164   \cs_set_eq:NN \slimits@ \displaylimits
165 }
166 \cs_if_exist:NF \ilimits@ {
167   \cs_set_eq:NN \ilimits@ \nolimits
168 }
169 \chardef \g_l_uni_math_dots_binary_char = `
170 \chardef \g_l_uni_math_dots_comma_char = `...
171 \chardef \g_l_uni_math_dots_int_char = `
172 \chardef \g_l_uni_math_dots_other_char = `...
173
174 \cs_set_protected:Npn \DOTSB {
175   \__l_uni_math_set_previous_dots_type:w \g_l_uni_math_dots_binary_char
176 }
177
178 \cs_set_protected:Npn \DOTSX {
179   \__l_uni_math_set_previous_dots_type:w \g_l_uni_math_dots_other_char
180 }
181
182 \cs_set_protected:Npn \DOTSI {
183   \__l_uni_math_set_previous_dots_type:w \g_l_uni_math_dots_int_char
184 }
185

```

```

186 \cs_set_protected:Npn \DOTSC {
187   \__l_uni_math_set_previous_dots_type:w \g_l_uni_math_dots_comma_char
188 }
189
190 \lua_load_module:n { lua-unicode-math }
191
192 \cs_new_protected:Npn \__l_uni_math_define_mathstyle_cmd:n #1 {
193   \cs_new_protected:cpx { sym #1 } ##1 {
194     \group_begin:
195       \mathfamattr = \use:c { c__l_uni_math_attribute_sym #1 _int }
196       ##1
197     \group_end:
198   }
199 }
200
201 \int_new:N \g__l_uni_math_max_mathstyle_int
202 \int_gset:Nn \g__l_uni_math_max_mathstyle_int { 512 }
203 \cs_new:Npn \__l_uni_math_provide_mathstyle_id:n #1 {
204   \cs_if_exist:cF { c__l_uni_math_attribute_sym #1 _int } {
205     \int_const:cn { c__l_uni_math_attribute_sym #1 _int } { \g__l_uni_math_max_mathstyle_int
206     \int_incr:N \g__l_uni_math_max_mathstyle_int
207     \__l_uni_math_define_mathstyle_cmd:n { #1 }
208   }
209 }
210
211 % This should be
212 % \tex_Umathcharnumdef:D \c__l_uni_math_attribute_unset_int = -"7FFFFFFF \scan_stop
213 % but LuaTeX is too buggy to save this correctly.
214 \tex_Umathchardef:D \c__l_uni_math_attribute_unset_int = "0 "80 "1 \scan_stop:
215 \tex_Umathcharnumdef:D \c__l_uni_math_attribute_symnormal_int = 1023 \scan_stop:
216 \cs_new_protected:Npn \symnormal #1 {
217   \group_begin:
218     \mathfamattr = \c__l_uni_math_attribute_unset_int
219     #1
220   \group_end:
221 }
222 \cs_gset:Npn \mathnormal { \symnormal }
223
224 \seq_set_from_clist:Nn \l_tmpa_seq {
225   up, rm, it, tt, bf, sf
226 }
227 \seq_map_inline:Nn \l_tmpa_seq {
228   \cs_new_eq:cc { mathtext #1 } { math #1 }
229 }
230 \prop_set_from_keyval:Nn \l_tmpa_prop {
231   up = 0, bfup = 1, it = 2, bfit = 3,
232   sfup = 4, bfsfup = 5, sfit = 6, bfsfit = 7,
233   cal = 8, bfcal = 9,
234   scr = 12, bfscr = 13,
235   frak = 16, bffrak = 17,
236   tt = 20,
237   bb = 24,
238 }
239 \prop_map_inline:Nn \l_tmpa_prop {

```

```

240 \int_const:cn { c__l_uni_math_attribute_sym #1 _int } { #2 }
241 \__l_uni_math_define_mathstyle_cmd:n { #1 }
242 \cs_set_eq:cc { math #1 } { sym #1 }
243 }
244 \cs_set_eq:NN \symrm \symup
245 \cs_set_eq:NN \mathtextup \mathtextrm
246 \cs_set_eq:NN \mathtextsf \mathsf
247 \cs_set:Npn \mathbfsf { \symbfsf }
248
249 \seq_map_inline:Nn \l_tmpa_seq {
250 \cs_set_eq:cc { math #1 } { mathtext #1 }
251 }
252
253 \cs_new:cpn { __l_uni_math_UnicodeMathSymbol_ \token_to_str:N \mathord :nn } #1 #2 {
254 \cs_set:Npx #1 {
255 \char_generate:nn {#2} {12}
256 }
257 }
258 \tl_map_inline:nn {\mathbin \mathclose \mathpunct \mathrel} {
259 \cs_new_eq:cc
260 { __l_uni_math_UnicodeMathSymbol_ \token_to_str:N #1 :nn }
261 { __l_uni_math_UnicodeMathSymbol_ \token_to_str:N \mathord :nn }
262 }
263
264 \cs_new:cpn { __l_uni_math_UnicodeMathSymbol_ \token_to_str:N \mathop :nn } #1 #2 {
265 \exp_args:Nc \Umathchardef { \cs_to_str:N #1 op } 1~\symlummain #2~
266 \cs_set:Npx #1 {
267 \char_generate:nn {#2} {12}
268 }
269 \mathcode #2 = "8000~
270 \cs_set:cpx { \char_generate:nn {"FFFF"} {12} \char_generate:nn {#2} {12} } {
271 __l_uni_math_is_integral_cp:wTF #2 { \DOTSI } { \DOTSB }
272 \use:c { \cs_to_str:N #1 op }
273 __l_uni_math_is_integral_cp:wTF #2 { \ilimits@ } { \slimits@ }
274 }
275 }
276
277 \cs_new:cpn { __l_uni_math_UnicodeMathSymbol_ \token_to_str:N \mathopen :nn } #1 #2 {
278 \token_if_eq_meaning:NNTF #1 \sqrt {
279 \cs_set:Npx \sqrtsign {
280 \Uradical \symlummain #2~
281 }
282 \cs_set:Npx \root ##1 \of {
283 \Uroot \symlummain #2~ { ##1 }
284 }
285 }{
286 \cs_set:Npx #1 {
287 \char_generate:nn {#2} {12}
288 }
289 }
290 }
291
292 % For a \mathalpha command starting with \mup like \mupalpha this will be called as
293 % \__l_uni_math_uproot_assign_mup_char:nNn {alpha} \Alpha {"...}

```

```

294 \cs_new_protected:Npn \__l_uni_math_uproot_assign_mup_char:nNn #1 #2 #3 {
295   \cs_set:Npx #2 {
296     \symup {\char_generate:nn {#3} {12}}
297   }
298   \cs_set:cpx {#1} {
299     \char_generate:nn {#3} {12}
300   }
301 }
302
303 % For a \mathalpha command not starting with \mup this will be called as \__l_uni_math_uproot
304 \cs_new_protected:Npn \__l_uni_math_uproot_assign_nonmup_alpha:nNn #1 #2 #3 {
305   \cs_set:Npx #2 {
306     \char_generate:nn {#3} {12}
307   }
308 }
309
310 \group_begin:
311 \cs_set:Npn \l_tmp_cs:n #1 {
312   \group_end:
313
314   \cs_new_protected:Npn \__l_uni_math__check_mup_helper:w ##1 #1 ##2 \q_mark ##3 ##4 \q_stop
315     ##3 {##2}
316   }
317
318   \cs_new:cpn { __l_uni_math_UnicodeMathSymbol_ \token_to_str:N \mathalpha :nn } ##1 {
319     \exp_after:wN \__l_uni_math__check_mup_helper:w \token_to_str:N ##1 \q_mark \__l_uni_math
320   }
321 }
322
323 \exp_args:No \l_tmp_cs:n {
324   \token_to_str:N \mup
325 }
326
327 \cs_new:cpn { __l_uni_math_UnicodeMathSymbol_ \token_to_str:N \mathfence :nn } #1 #2 {
328   \cs_set:Npx #1 {
329     \char_generate:nn {#2} {12}
330   }
331   \cs_set:cpx {l \cs_to_str:N #1} {
332     \Udelimiter 4 ~ \symlummain #2 ~
333   }
334   \cs_set:cpx {r \cs_to_str:N #1} {
335     \Udelimiter 5 ~ \symlummain #2 ~
336   }
337 }
338
339 \cs_new:cpn { __l_uni_math_UnicodeMathSymbol_ \token_to_str:N \mathaccent :nn } #1 #2 {
340   \cs_set_protected:Npx #1 {
341     \Umathaccent fixed 0 ~ \symlummain #2 ~
342   }
343 }
344
345 \cs_new:cpn { __l_uni_math_UnicodeMathSymbol_ \token_to_str:N \mathbotaccent :nn } #1 #2 {
346   \cs_set:Npx #1 {
347     \Umathaccent bottom~fixed 0 ~ \symlummain #2 ~

```

```

348   }
349 }
350
351 \cs_new:cpn { __l_uni_math_UnicodeMathSymbol_ \token_to_str:N \mathaccentwide :nn } #1 #2 {
352   \cs_set:Npx #1 {
353     \Umathaccent 0 ~ \symlummain #2 ~
354   }
355 }
356
357 \cs_new:cpn { __l_uni_math_UnicodeMathSymbol_ \token_to_str:N \mathbotaccentwide :nn } #1 #2 {
358   \cs_set:Npx #1 {
359     \Umathaccent bottom 0 ~ \symlummain #2 ~
360   }
361 }
362
363 \cs_new:cpn { __l_uni_math_UnicodeMathSymbol_ \token_to_str:N \mathaccentoverlay :nn } #1 #2 {
364   \cs_set:Npx #1 {
365     \Umathaccent overlay 0 ~ \symlummain #2 ~
366   }
367 }
368
369 \cs_new:cpn { __l_uni_math_UnicodeMathSymbol_ \token_to_str:N \mathover :nn } #1 #2 {
370   \cs_set:Npx #1 ##1 {
371     \mathop {
372       \Udelimiterover \symlummain #2 { ##1 }
373     }
374     \limits
375   }
376 }
377
378 \cs_new:cpn { __l_uni_math_UnicodeMathSymbol_ \token_to_str:N \mathunder :nn } #1 #2 {
379   \cs_set:Npx #1 ##1 {
380     \mathop {
381       \Udelimiterunder \symlummain #2 { ##1 }
382     }
383     \limits
384   }
385 }
386
387 \cs_generate_variant:Nn \exp_args:Ne {c}
388 \cs_new:Npn \UnicodeMathSymbol #1 #2 #3 #4 {
389   \use:c { __l_uni_math_UnicodeMathSymbol_ \token_to_str:N #3 :nn }
390   {#2} {#1}
391 }
392 \input {unicode-math-table}
393 \cs_undefine:N \UnicodeMathSymbol
394
395 \cs_set_protected:Npn \triangle { \mathord { \bigtriangleup } }
396 \cs_set_protected:Npn \mathellipsis { \mathinner { \unicodeellipsis } }
397 \cs_set_protected:Npn \cdots { \mathinner { \unicodcdots } }
398
399 \clist_map_inline:nn {
400   \to \rightarrow,
401   \le \leq,

```

```

402 \ge \geq,
403 \neq \neq,
404 \bigcirc \mdlgwhtcircle,
405 \circ \vysmwhtcircle,
406 \bullet \smbllkcircle,
407 \yen \mathyen,
408 \sterling \mathsterling,
409 \diamond \smwhtdiamond,
410 \emptyset \varnothing,
411 \hbar \hslash,
412 \land \wedge,
413 \lor \vee,
414 \owns \ni,
415 \gets \leftarrow,
416 \mathring \ocirc,
417 \lnot \neg,
418 \longdiv \longdivsign,
419 \backepsilon \upbackepsilon,
420 \eth \matheth,
421 \dotsb \cdots,
422 \@cdots \cdots,
423 \lvert \Vert,
424 } {
425 \cs_set_eq:NN #1
426 }
427
428 \cs_new:Npn \__l_uni_math_set_math_active:npx #1 {
429   \char_set_mathcode:nn { #1 } { "8000 }
430   \cs_set_protected:cpx { \char_generate:nn {"FFFF" {12} \char_generate:nn { #1 } {12} }
431 }
432
433 \__l_uni_math_set_math_active:npx { ``\` } {
434   \prime_helper:w "2032~
435 }
436
437 \__l_uni_math_set_math_active:npx { ``\` } {
438   \prime_helper:w "2035~
439 }
440
441 \int_step_inline:nnn {"0"} {"F"} {
442   \__l_uni_math_set_math_active:npx { "FE00 + #1 } {
443     \__l_uni_math_variation_selector:w #1 ~
444   }
445 }
446
447 \int_step_inline:nnn {"10"} {"FF"} {
448   \__l_uni_math_set_math_active:npx { "E00F0 + #1 } {
449     \__l_uni_math_variation_selector:w #1 ~
450   }
451 }
452
453 \cs_set_protected:Npn \uproot #1 {
454   \__l_uni_math_uproot:w #1 \scan_stop:
455 }

```

```

456
457 \cs_set_protected:Npn \leftroot #1 {
458   \__l_uni_math_leftroot:w #1 \scan_stop:
459 }

```

Some fixes for amsmath: Since amsmath is defining `\leftroot`, `\uproot` and `\root` with non Unicode definitions, we need to hide our definitions and restore them afterwards. We define `\varGamma` to stop amsmath from trying to define greek letter variants.

```

460 \tl_const:Nn \c__l_uni_math_amsmath_cmds_tl {
461   \uproot
462   \leftroot
463   \iint
464   \iiint
465   \iiiiint
466   \dddot
467   \ddddot
468   \overlefttrightharrow
469   \underrightharrow
470   \underleftarrow
471   \underleftrightharrow
472   \hat
473   \check
474   \tilde
475   \acute
476   \grave
477   \dot
478   \ddot
479   \breve
480   \bar
481   \vec
482   \mathring
483   \DOTSC
484   \DOTSI
485   \DOTSX
486   \DOTSB
487   \mdots@
488   \cdots
489   \ldots
490 }
491 \tl_const:Nn \c__l_uni_math_amsmath_cmds_defined_tl {
492   \prod
493   \coprod
494   \bigwedge
495   \bigvee
496   \bigcap
497   \bigcup
498   \bigodot
499   \bigoplus
500   \bigotimes
501   \bigsqcup
502   \root
503   \int
504   \oint
505   \overrightarrow

```

```

506 \overleftarrow
507 }
508 \hook_gput_code:nnn { package/amsmath/before } {..} {
509 \tl_map_inline:Nn \c__l_uni_math_amsmath_cmds_tl {
510 \cs_new_eq:cN { __l_uni_math_saved_ \cs_to_str:N #1 } #1
511 \cs_undefine:N #1
512 }
513 \tl_map_inline:Nn \c__l_uni_math_amsmath_cmds_defined_tl {
514 \cs_new_eq:cN { __l_uni_math_saved_ \cs_to_str:N #1 } #1
515 }
516 \cs_set:Npn \varGamma { \temporary_definition_do_not_use }
517 }
518 \hook_gput_code:nnn { package/amsmath/after } {..} {
519 \tl_map_inline:Nn \c__l_uni_math_amsmath_cmds_tl {
520 \cs_set_eq:Nc #1 { __l_uni_math_saved_ \cs_to_str:N #1 }
521 \cs_undefine:c { __l_uni_math_saved_ \cs_to_str:N #1 }
522 }
523 \tl_map_inline:Nn \c__l_uni_math_amsmath_cmds_defined_tl {
524 \cs_set_eq:Nc #1 { __l_uni_math_saved_ \cs_to_str:N #1 }
525 \cs_undefine:c { __l_uni_math_saved_ \cs_to_str:N #1 }
526 }
527 \cs_undefine:N \varGamma
528 }
529 \addto@hook \every@math@size {
530 \__l_uni_math_every_math_size:
531 }

```

2.1 Customization

We defined templates to customize the behavior of lua-unicode-math. The main customization point for the user is the lua-unicode-math-style which selects how `\symnormal` and `\symbf` behave.

```

532 \NewTemplateType {lua-unicode-math-style} {0}

```

In the default interface `substyles` a `mathstyle` is defined in terms of two nested instances of type `lua-unicode-math-style-cmd`. This template allows to define or redefine a `mathstyle` like `normal`, `bf` or `up` with corresponding `\sym...` command.

```

533 \NewTemplateType {lua-unicode-math-style-cmd} {1}
534 \DeclareTemplateInterface {lua-unicode-math-style} {substyles} {0} {
535 normal: instance {lua-unicode-math-style-cmd},
536 bf: instance {lua-unicode-math-style-cmd},
537 sf: instance {lua-unicode-math-style-cmd},
538 bfsf: instance {lua-unicode-math-style-cmd},
539 }

```

By default a new style command instance is defined by defining mappings for the five main math alphabets to existing styles.

```

540 \DeclareTemplateInterface {lua-unicode-math-style-cmd} {alphabet-style-mapping} {1} {
541 Latin: tokenlist,
542 latin: tokenlist,
543 Greek: tokenlist,
544 greek: tokenlist,
545 digit: tokenlist,
546 }

```

By default a new style command instance is defined by defining mappings for the five main math alphabets to existing styles.

```

547 \DeclareTemplateCode {lua-unicode-math-style} {substyles} {0} {
548   normal = \_l\_l\_uni\_math\_instance\_normal:n,
549   bf = \_l\_l\_uni\_math\_instance\_bf:n,
550   sf = \_l\_l\_uni\_math\_instance\_sf:n,
551   bfsf = \_l\_l\_uni\_math\_instance\_bfsf:n,
552 } {
553   \_l\_l\_uni\_math\_instance\_normal:n { normal }
554   \_l\_l\_uni\_math\_instance\_bf:n { bf }
555   \_l\_l\_uni\_math\_instance\_sf:n { sf }
556   \_l\_l\_uni\_math\_instance\_bfsf:n { bfsf }
557 }
558 \cs_generate_variant:Nn \_l\_l\_uni\_math\_set\_mathstyle\_mappings:NNNNNN { cccccc }
559 \tl_new:N \l\_l\_l\_uni\_math\_Latin\_style\_tl
560 \tl_new:N \l\_l\_l\_uni\_math\_latin\_style\_tl
561 \tl_new:N \l\_l\_l\_uni\_math\_Greek\_style\_tl
562 \tl_new:N \l\_l\_l\_uni\_math\_greek\_style\_tl
563 \tl_new:N \l\_l\_l\_uni\_math\_digit\_style\_tl
564 \DeclareTemplateCode {lua-unicode-math-style-cmd} {alphabet-style-mapping} {1} {
565   Latin = \l\_l\_l\_uni\_math\_Latin\_style\_tl,
566   latin = \l\_l\_l\_uni\_math\_latin\_style\_tl,
567   Greek = \l\_l\_l\_uni\_math\_Greek\_style\_tl,
568   greek = \l\_l\_l\_uni\_math\_greek\_style\_tl,
569   digit = \l\_l\_l\_uni\_math\_digit\_style\_tl,
570 } {
571   \_l\_l\_uni\_math\_provide\_mathstyle\_id:n { #1 }
572   \_l\_l\_uni\_math\_set\_mathstyle\_mappings:ccccc
573   { c\_l\_l\_uni\_math\_attribute\_sym #1\_int }
574   { c\_l\_l\_uni\_math\_attribute\_sym \l\_l\_l\_uni\_math\_Latin\_style\_tl\_int }
575   { c\_l\_l\_uni\_math\_attribute\_sym \l\_l\_l\_uni\_math\_latin\_style\_tl\_int }
576   { c\_l\_l\_uni\_math\_attribute\_sym \l\_l\_l\_uni\_math\_Greek\_style\_tl\_int }
577   { c\_l\_l\_uni\_math\_attribute\_sym \l\_l\_l\_uni\_math\_greek\_style\_tl\_int }
578   { c\_l\_l\_uni\_math\_attribute\_sym \l\_l\_l\_uni\_math\_digit\_style\_tl\_int }
579 }

```

Finally we define some defaults.

```

580 \DeclareInstance{lua-unicode-math-style}{TeX}{substyles}{
581   normal = TeX,
582   bf = TeX-bf,
583   sf = upright-sf,
584   bfsf = upright-bfsf,
585 }
586 \DeclareInstance{lua-unicode-math-style}{ISO80000-2}{substyles}{
587   normal = ISO80000-2,
588   bf = ISO80000-2-bf,
589   sf = italic-sf,
590   bfsf = italic-bfsf,
591 }
592 \DeclareInstance{lua-unicode-math-style}{french}{substyles}{
593   normal = french,
594   bf = upright-bf,
595   sf = upright-sf,
596   bfsf = upright-bfsf,

```

```

597 }
598 \DeclareInstance{lua-unicode-math-style}{upright}{substyles}{
599   normal = upright,
600   bf = upright-bf,
601   sf = upright-sf,
602   bfsf = upright-bfsf,
603 }
604 \DeclareInstance{lua-unicode-math-style-cmd}{TeX}{alphabet-style-mapping}{
605   Latin = it,
606   latin = it,
607   Greek = up,
608   greek = it,
609   digit = up,
610 }
611 \DeclareInstance{lua-unicode-math-style-cmd}{TeX-bf}{alphabet-style-mapping}{
612   Latin = bfup,
613   latin = bfup,
614   Greek = bfup,
615   greek = bfit,
616   digit = bfup,
617 }
618 \DeclareInstance{lua-unicode-math-style-cmd}{ISO80000-2}{alphabet-style-mapping}{
619   Latin = it,
620   latin = it,
621   Greek = it,
622   greek = it,
623   digit = up,
624 }
625 \DeclareInstance{lua-unicode-math-style-cmd}{ISO80000-2-bf}{alphabet-style-mapping}{
626   Latin = bfit,
627   latin = bfit,
628   Greek = bfit,
629   greek = bfit,
630   digit = bfup,
631 }
632 \DeclareInstance{lua-unicode-math-style-cmd}{french}{alphabet-style-mapping}{
633   Latin = up,
634   latin = it,
635   Greek = up,
636   greek = up,
637   digit = up,
638 }
639 \DeclareInstance{lua-unicode-math-style-cmd}{upright}{alphabet-style-mapping}{
640   Latin = up,
641   latin = up,
642   Greek = up,
643   greek = up,
644   digit = up,
645 }
646 \DeclareInstance{lua-unicode-math-style-cmd}{upright-bf}{alphabet-style-mapping}{
647   Latin = bfup,
648   latin = bfup,
649   Greek = bfup,
650   greek = bfup,

```

```

651   digit = bfup,
652 }
653 \DeclareInstance{lua-unicode-math-style-cmd}{upright-sf}{alphabet-style-mapping}{
654   Latin = sfup,
655   latin = sfup,
656   Greek = sfup,
657   greek = sfup,
658   digit = sfup,
659 }
660 \DeclareInstance{lua-unicode-math-style-cmd}{italic-sf}{alphabet-style-mapping}{
661   Latin = sfit,
662   latin = sfit,
663   Greek = sfit,
664   greek = sfit,
665   digit = sfit,
666 }
667 \DeclareInstance{lua-unicode-math-style-cmd}{upright-bfsf}{alphabet-style-mapping}{
668   Latin = bfsfup,
669   latin = bfsfup,
670   Greek = bfsfup,
671   greek = bfsfup,
672   digit = bfsfup,
673 }
674 \DeclareInstance{lua-unicode-math-style-cmd}{italic-bfsf}{alphabet-style-mapping}{
675   Latin = bfsfit,
676   latin = bfsfit,
677   Greek = bfsfit,
678   greek = bfsfit,
679   digit = bfsfit,
680 }
681 \UseInstance {lua-unicode-math-style} {TeX}

```

2.2 Math text alphabet adaption

When used without fontspec, the math text alphabets are not automatically replaced with Unicode fonts. For the common case of having Computer Modern configured as text font we are replacing the font with Latin Modern in base mode.

```

682 \group_begin:
683 \use:e { \cs_new:Npn \exp_not:N \__l_uni_math_helper:w #1\token_to_str:c {OT1/cm}#2\token_to_
684   \tl_if_empty:nTF {#4} {
685     #6
686   } {
687     #5 \exp_not:c {TU/lm#2-base/#3}
688   }
689 }
690 \cs_set:Npn \alpha@elt #1 #2 #3 {
691   \exp_not:N \alpha@elt \exp_not:N #1
692   \exp_last_unbraced:Ne \__l_uni_math_helper:w { \token_to_str:N #3 \s_stop \token_to_str:c{
693     { \exp_not:N \M@TU }
694     { \exp_not:N #2 \exp_not:N #3 }
695   }
696   \tl_gset:Nx \alpha@list {
697     \alpha@list

```

```

698 }
699
700 \cs_set:Npn \getanddefine@fonts #1 #2 {
701   \exp_not:n { \getanddefine@fonts #1 }
702   \exp_last_unbraced:Ne \__l_uni_math_helper:w { \token_to_str:N #2 \s_stop \token_to_str:c{0
703     {}
704     { \exp_not:N #2 }
705   }
706 \cs_set:Npn \__l_uni_math_install_mathalphabet_helper:NNNN #1 #2 #3 #4 {
707   \exp_not:n { #1 #2 }
708   \exp_last_unbraced:Ne \__l_uni_math_helper:w { \token_to_str:N #4 \s_stop \token_to_str:c{0
709     { \exp_not:N \M@TU }
710     { \exp_not:N #3 \exp_not:N #4 }
711   }
712 \cs_set:Npn \install@mathalphabet #1 #2 {
713   \exp_not:n { \install@mathalphabet #1 }
714   { \__l_uni_math_install_mathalphabet_helper:NNNN #2 }
715 }
716 \cs_set:Npn \version@elt #1 {
717   \tl_gset:Nx #1 {
718     #1
719   }
720 }
721 \version@list
722 \group_end:

```