

Package **mathfont** v. 1.6 Code Implementation

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For easy, off-the-shelf use, type the following in your document preamble and compile using X_EL^AT_EX or L^AU_EL^AT_EX:

```
\usepackage[⟨font name⟩]{mathfont}
```

Abstract

The **mathfont** package provides a flexible interface for changing the font of math-mode characters. The package allows the user to specify a default unicode font for each of six basic classes of Latin and Greek characters, and it provides additional support for unicode math and alphanumeric symbols, including punctuation. Crucially, **mathfont** is compatible with both X_EL^AT_EX and L^AU_EL^AT_EX, and it provides several font-loading commands that allow the user to change fonts locally or for individual characters within math mode.

This file documents the code for the **mathfont** package. It is fairly technical, and first-time users may prefer to start with the user guide. Section 1 begins with the implementation basics, including package declaration, package-option declaration, and error messages. Section 2 deals with errors and messaging, and section 3 contains the code that adjusts the L^AT_EX kernel as well as necessary booleans and default font shapes. Section 4 contains the optional-argument parser for `\mathfont`, and section 5 contains the code for the `\mathfont` command itself. In section 6, the package initializes the commands for alphanumeric symbols, and section 7 contains the code for local font changes. Section 8 contains concluding material, and section 9 lists the unicode hex values used in symbol declaration. Version history and code index appear on subsequent pages. For documentation of the user-level commands, see `mathfont_user_guide.pdf`, and for a list of symbols accessible with **mathfont**, see `mathfont_symbol_list.pdf`. Both documentation files are included with the **mathfont** installation and are available on CTAN.

1 Implementation Basics

First and foremost, the package needs to declare itself.

```
1 \NeedsTeXFormat{LaTeX2e}
2 \ProvidesPackage{mathfont}[2019/12/05 v. 1.6 Package mathfont]
3 \newif\ifM@font@loaded
4 \newif\ifM@special\let\specialtrue
5 \newif\ifM@XeTeXLuaTeX
```

Acknowledgements: Thanks to Lyric Bingham for her work checking my unicode hex values. Thanks to Herbert Voss and Andreas Zidak for pointing out bugs in previous versions of **mathfont**.

We begin by disabling the five user-level commands. If `mathfont` runs normally, it will override these definitions later, but if it throws one of its two fatal errors, it will `\endinput` while the user-level commands are error messages. That way the commands don't do anything, and the user gets information on why not. We make the "bad" definitions gobble their original arguments to avoid a "missing `\begin{document}`" error.

```

6 \def\@gobbletwo@brackets[#1]#2{}
7 \def\M@NoMathfontError#1{\PackageError{mathfont}
8   {\MessageBreak Invalid command\MessageBreak
9    \string#1 on line \the\inputlineno}
10  {Your command was ignored. I couldn't\MessageBreak
11   load mathfont successfully, so this\MessageBreak
12   control sequence was never defined.}}
13 \def\mathfont{\M@NoMathfontError\mathfont
14   \@ifnextchar[\@gobbletwo@brackets\@gobble}
15 \def\setfont{\M@NoMathfontError\setfont\@gobble}
16 \def\newmathrm{\M@NoMathfontError\newmathrm\@gobbletwo}
17 \def\newmathit{\M@NoMathfontError\newmathit\@gobbletwo}
18 \def\newmathbf{\M@NoMathfontError\newmathbf\@gobbletwo}
19 \def\newmathbfit{\M@NoMathfontError\newmathbf\@gobbletwo}
20 \def\newmathfontcommand{\M@NoMathfontError\newmathfontcommand\@gobblefour}

```

We absolutely must have `fontspec`. Before anything else, `TEX` should check for `fontspec.sty` and stop reading in `mathfont` if it can't find the file. We change `+` to active to force `TEX` to print the required spaces in the message, and we put the entire production inside a group to make this change local. The `\@gobbletwo` eats the extra period and return that `LATEX` adds to the error message. Notice the strategic placement of the `\endgroups`. We need `\M@NoFontspecError` to both tokenize its definition and then evaluate while `+` has catcode 13. If we evaluate `\M@NoFontspecError` outside the group, `TEX` will issue an `\inaccessible` error, so we should place the macro inside the group. However, we want `\AtBeginDocument` and `\endinput` outside the group, so we need a separate `\endgroup` for each branch. We put the `\endgroup` in the false branch between the error and the remaining material.

```

21 \begingroup
22 \catcode`+=\active
23 \def+{ }
24 \def\M@NoFontspecError{\GenericError{%
25   {\MessageBreak\MessageBreak
26   Package mathfont fatal error:
27   \MessageBreak\MessageBreak
28   +*****\MessageBreak
29   +*****\MessageBreak
30   +!!!FATAL ERROR!!+\MessageBreak
31   +*****\MessageBreak
32   +++++Could not++++\MessageBreak
33   +++++find+fontspec+++*\MessageBreak
34   ++++++\MessageBreak
35   +*****\MessageBreak\@gobbletwo}
36   {See the mathfont package documentation for explanation.}}

```

```

37 {Um, I couldn't find the file fontspec.sty.\MessageBreak
38 The mathfont package is useless without\MessageBreak
39 fontspec, so I'm going to stop reading it\MessageBreak
40 in now. (You won't be able to use any\MessageBreak
41 commands from mathfont in your document.)\MessageBreak
42 To make mathfont work correctly, please\MessageBreak
43 install fontspec on your computer.}}
44 \IfFileExists{fontspec.sty}{\endgroup}
45 {\M@NoFontspecError\endgroup
46 \AtEndOfPackage{\typeout{Package mathfont failed to load\on@line}}
47 \endinput}

```

We also want a salient error message if the engine doesn't define the required X_ET_EX or LuaT_EX primitives.

```

48 \begingroup
49 \catcode`+=\active
50 \def+{ }
51 \def\M@XeTeXLuaTeXError{\GenericError{}{%
52   {\MessageBreak\MessageBreak
53     Package mathfont fatal error:
54   \MessageBreak\MessageBreak
55   +*****\MessageBreak
56   ++++++\MessageBreak
57   +!!!FATAL ERROR!!+\MessageBreak
58   ++++++\MessageBreak
59   +****Missing XeTeX+**\MessageBreak
60   ++++++or LuaTeX+**\MessageBreak
61   ++++++\MessageBreak
62   +*****\MessageBreak\@gobbletwo}%
63   {See the mathfont package documentation for explanation.}%
64   {I need XeTeX or LuaTeX to make this\MessageBreak
65   package work properly. It looks like the\MessageBreak
66   current engine is something else, so I'm\MessageBreak
67   going to stop reading in the package file\MessageBreak
68   now. (You won't be able to use commands\MessageBreak
69   from mathfont in your document.) To make\MessageBreak
70   mathfont work correctly, please retypeset\MessageBreak
71   this file with one of those two engines.}}

```

Check that the engine has defined the necessary primitives.

```

72 \ifx\Umathcode\@undefined
73 \else
74   \ifx\Umathchardef\@undefined
75   \else
76     \ifx\Umathaccent\@undefined
77     \else
78       \M@XeTeXLuaTeXtrue
79     \fi
80   \fi

```

```

81 \fi
82 \ifM@XeTeXLuaTeX
83   \endgroup
84 \else
85   \M@XeTeXLuaTeXError\endgroup
86   \AtEndOfPackage{\typeout{Package mathfont failed to load\on@line}}
87   \expandafter\endinput% we should \endinput with a balanced conditional
88 \fi

```

Some package options are now deprecated.

```

89 \def\M@OptionDeprecated#1#2{\PackageError{mathfont}
90   {Option "#1" depreciated}
91   {Your option was ignored. Please\MessageBreak
92    use #2\MessageBreak
93    instead. For more information,\MessageBreak
94    see the mathfont documentation.}}

```

We code the package options, and for font names, `\DeclareOption*` tells `mathfont` how to handle an unknown option. The package sets `\ifM@font@loaded` to true and stores the font name in `\M@font@load`.

```

95 \IfFileExists{atveryend.sty}
96   {\RequirePackage{atveryend}\let\M@SpecialHook\AtVeryVeryEnd}
97   {\let\M@SpecialHook\AtEndDocument}
98 \DeclareOption{packages}{\M@OptionDeprecated{packages}
99   {\string\restoremathinternals}}
100 \DeclareOption{operators}{\M@OptionDeprecated{operators}
101   {the bigops keyword with \string\mathfont}}
102 \DeclareOption{no-operators}{\M@OptionDeprecated{no-operators}
103   {the bigops keyword with \string\mathfont}}
104 \DeclareOption{easter-egg}{\ifM@special\M@specialfalse
105   \def\EasterEggUpdate{\show\@sterEggUpdate}
106   \def\@sterEggUpdate{Okay, opening your Easter egg}
107     \EasterEggUpdate
108   \def\@sterEggUpdate{..}
109     \EasterEggUpdate
110     \EasterEggUpdate
111   \typeout{^^Jm, I think it flew out the^^J%
112     window. Check back here when^^J%
113     everything's done compiling^^J}
114   \def\@sterEggUpdate{Uh oh}
115     \EasterEggUpdate
116   \def\@sterEggUpdate{Still wrangling. Try back later}
117   \AtBeginDocument{\EasterEggUpdate
118 \M@SpecialHook{%
119   \typeout{^^JHappy, happy day! Happy,^^J%
120     happy day! Clap your hands,^^J%
121     and be glad your hovercraft^^J%
122     isn't full of eels!^^J}
123   \def\@sterEggUpdate{Got it}}

```

```

124      \EasterEggUpdate}
125  \fi}%
  my easter egg :)
```

Interpret an unknown option as a font name and save it to feed to fontspec.

```

126 \DeclareOption*{\M@font@loadedtrue\edef\M@font@load{\CurrentOption}}
127 \ProcessOptions*
```

2 Errors and Messaging

Some error and informational messages. We begin with general informational messages.

```

128 \def\M@FontChangeInfo#1#2{\wlog{Package mathfont Info:
129   Changing #1 characters to #2!}}
130 \def\M@CommandInitializeInfo#1{\wlog{Package mathfont Info: Initializing
131   \noexpand#1 font-change command on line \the\inputlineno.}}
132 \def\M@NewFontCommandInfo#1#2#3#4{\wlog{Package mathfont Info: Creating
133   math alphabet command \noexpand#1 using^{#3}_{#4}}
134   #2 font with series #3 and shape #4 on line \the\inputlineno.}
135 \def\M@SetInternalsInfo{\wlog{Package mathfont Info: Setting
136   \string\set@mathchar, \string\set@mathsymbol, \string\set@mathaccent.}}
137 \def\M@RestoreInternalsInfo{\wlog{Package mathfont Info: Fixing
138   \string\set@mathchar, \string\set@mathsymbol, \string\set@mathaccent.}}
139 \def\M@CharsSetWarning#1{\PackageWarning{mathfont}
140   {Font for #1 chars has already\MessageBreak
141    been set, so I'm ignoring this\MessageBreak
142    keyword}}
```

Warnings for the \mathbb, etc. commands.

```

143 \def\M@DoubleArgWarning#1#2{\PackageWarning{mathfont}
144   {I'm ignoring the multiple characters\MessageBreak
145    "#1" that are grouped together in\MessageBreak
146    the argument of your \expandafter\string#2\space command\MessageBreak}}
147 \def\M@NestedArgWarning#1#2{\PackageWarning{mathfont}
148   {I'm ignoring the nested argument\MessageBreak
149    "#1" from your \expandafter\string#2\MessageBreak
150    command}}
151 \def\M@ControlSequenceArgWarning#1#2{\PackageWarning{mathfont}
152   {I'm ignoring the unexpandable control\MessageBreak
153    sequence \expandafter\string#1\space that appears in the\MessageBreak
154    argument of your \expandafter\string#2\space command\MessageBreak}}
155 \def\M@CharacterArgWarning#1#2{\PackageWarning{mathfont}
156   {I'm ignoring the "#1" in the\MessageBreak
157    argument of your \expandafter\string#2\MessageBreak
158    command because it isn't a\MessageBreak
159    letter or digit}}
```

Warning for deprecated commands.

```

160 \def\M@DeprecatedWarning#1#2{\PackageWarning{mathfont}
161   {Your \string#1\space command is\MessageBreak}}
```

```
162 depreciated, and I replaced it with\MessageBreak
163 \string#2}}
```

Error message from loading fonts我没有 without no-math.

```
164 \def\M@NoMathError{\PackageError{mathfont}
165   {Package fonts我没有 was loaded\MessageBreak
166   without the "no-math" option}
167   {This isn't really an error--it's fine to load\MessageBreak
168   fonts我没有 without "no-math." However, strange\MessageBreak
169   things could happen, so beware of any sudden\MessageBreak
170   and unexpected font changes. To resolve this\MessageBreak
171   error message, load fonts我没有 with the "no-\MessageBreak
172   math" option. If you haven't loaded fonts我没有\MessageBreak
173   manually, try loading mathfont earlier in your\MessageBreak
174   preamble.}}
```

Error messages associated with \mathfont.

```
175 \def\M@InvalidOptionError#1{\PackageError{mathfont}
176   {Invalid option "#1"\MessageBreak
177   for \string\mathfont\on@line}
178   {Hm. Check that you spelled the\MessageBreak
179   option correctly. Otherwise, I'm\MessageBreak
180   not sure what's wrong. Is this\MessageBreak
181   option listed in the package\MessageBreak
182   documentation? In any event, I'm\MessageBreak
183   going to ignore this option.}}
184 \def\M@InvalidSuboptionError#1{\PackageError{mathfont}
185   {Invalid suboption "#1"\MessageBreak
186   for \string\mathfont\on@line}
187   {Hm. Check that you spelled the\MessageBreak
188   suboption correctly. Otherwise, I'm\MessageBreak
189   not sure what's wrong. Is this\MessageBreak
190   suboption listed in the package\MessageBreak
191   documentation? In any event, I'm\MessageBreak
192   going to ignore this suboption.}}
193 \def\M@MissingOptionError{\PackageError{mathfont}
194   {Missing option for\MessageBreak
195   \string\mathfont\on@line}
196   {It looks like you included a , or = in\MessageBreak
197   the optional argument of \string\mathfont\MessageBreak
198   but didn't put anything before it.}}
199 \def\M@MissingSuboptionError{\PackageError{mathfont}
200   {Missing suboption for\MessageBreak
201   \string\mathfont\on@line}
202   {It looks like you included an = somewhere\MessageBreak
203   but didn't put the suboption after it. Either\MessageBreak
204   that or you typed == instead of = in the\MessageBreak
205   optional argument of \string\mathfont.}}
206 \def\M@InternalsRestoredError{\PackageError{mathfont}
```

```

207 {Internal commands restored}
208 {This package slightly changes two LaTeX\MessageBreak
209 internal commands, and you really shouldn't\MessageBreak
210 be loading new math fonts without those\MessageBreak
211 adjustments. What happened here is that you\MessageBreak
212 used \string\mathfont\space in a situation where those\MessageBreak
213 two commands retain their original defini-\MessageBreak
214 tions. Presumably you used \string\mathfont\space after\MessageBreak
215 calling the \string\restoremathinternals\space command.\MessageBreak
216 I'm going to ignore this call to \string\mathfont.\MessageBreak
217 Try retypesetting this document with all\MessageBreak
218 \string\mathfont\space commands placed before you call\MessageBreak
219 \string\restoremathinternals.}}

```

Error messages for the \newmathrm, etc. commands.

```

220 \def\M@MissingControlSequenceError#1#2{\PackageError{mathfont}
221   {Missing control sequence\MessageBreak
222    for\string#1\MessageBreak on input line \the\inputlineno}
223   {Your command was ignored. Right now the\MessageBreak
224    first argument of \string#1\space is "#2."\MessageBreak
225    Please use a control sequence instead.}}
226 \def\M@DoubleArgError#1#2{\PackageError{mathfont}
227   {Multiple characters in\MessageBreak
228    first argument of \string#2\MessageBreak
229    on input line \the\inputlineno}
230   {Your command was ignored. Right now the\MessageBreak
231    first argument of \string#2\space is "#1,"\MessageBreak
232    which is multiple characters. Please use\MessageBreak
233    a single character instead.}}
234 \def\M@HModeError#1{\PackageError{mathfont}
235   {Missing \$ inserted. The\MessageBreak
236    command \string#1\space must be used in\MessageBreak
237    math mode\on@line}
238   {I generated an error because\MessageBreak
239    you used \string#1\space outside of\MessageBreak
240    math mode. I've inserted a \string$\MessageBreak
241    just before your \string#1, so\MessageBreak
242    we should be all good now.}}

```

3 Default Settings

We load the fontspec package in order to use its main font loading mechanism, and we \let the macro \cnewfont take on this function. We also make sure that fontspec was loaded with the no-math option because without it, fontspec may cause trouble with some of the math characters. If \g__fontspec_math_bool is equal to 1, mathfont will issue an error message.

```

243 \@ifpackageloaded{fontspec}
244   {\ifnum\csname g__fontspec_math_bool\endcsname=\@ne

```

```

245   \M@NoMathError
246   \fi}{\RequirePackage[no-math]{fontspec}}
247 \expandafter\let\expandafter\@newfont
248   \csname fontspec_set_family:Nnn\endcsname

```

We save `\set@mathchar` and `\set@mathsymbol` from the L^AT_EX kernel so we can change their definitions. We need to adapt these macros for use with unicode fonts, and we replace `\mathcode` and `\mathchardef` respectively with the X_ET_EX and LuaT_EX primitives `\Umathcode` and `\Umathchardef`. The unicode primitives support decimal input using a + sign, and we take advantage of that feature to avoid hexadecimal conversions.

```

249 \M@SetInternalsInfo
250 \let\@@set@mathchar\set@mathchar
251 \let\@@set@mathsymbol\set@mathsymbol
252 \let\@@set@mathaccent\set@mathaccent

```

Kernel command to set math characters from keystrokes.

```

253 \def\set@mathchar#1#2#3#4{%
254   \multiply\count\z@ by 16\relax
255   \advance\count\z@\count\tw@
256   \global\Umathcode`#2=\mathchar@type#3+#1+\count\z@\relax}

```

Kernel command to set math characters from control sequences.

```

257 \def\set@mathsymbol#1#2#3#4{%
258   \multiply\count\z@ by 16\relax
259   \advance\count\z@\count\tw@
260   \global\Umathchardef#2\mathchar@type#3+#1+\count\z@\relax}

```

Kernel command to set accents.

```

261 \def\set@mathaccent#1#2#3#4{%
262   \multiply\count\z@ by 16\relax
263   \advance\count\z@\count\tw@
264   \xdef#2{\Umathaccent\mathchar@type#3+#1+\the\count\z@\relax}}

```

We need to keep track of the number of times we have loaded a font, and the count `\M@count` fulfills this role. The `\M@toks` object will record a message that displays when the user calls `\mathfont`, and `\M@return` will keep track of when to add a carriage return to `\M@toks`.

```

265 \newcount\M@count
266 \newcount\M@return
267 \M@count\z@
268 \newtoks\M@toks

```

We create necessary booleans and the default math font shapes.

```

269 \newif\if@upper
270 \newif\if@lower
271 \newif\if@diacritics
272 \newif\if@greekupper
273 \newif\if@greeklower
274 \newif\if@agreekupper
275 \newif\if@agreeklower
276 \newif\if@cyrillicupper
277 \newif\if@cyrilliclower

```

```
278 \newif\if@hebrew
279 \newif\if@digits
280 \newif\if@operator
281 \newif\if@symbols
282 \newif\if@extsymbols
283 \newif\if@delimiters
284 \newif\if@arrows
285 \newif\if@bigops
286 \newif\if@extbigops
287 \newif\if@bb
288 \newif\if@cal
289 \newif\if@frak
290 \newif\if@bcal
291 \newif\if@bfrak
292 \newif\if@optionpresent
293 \newif\if@suboptionpresent
294 \newif\ifM@mathfont@firstoption
295 \newif\ifM@anychars@changed
296 \newif\ifM@arg@good
297 \def\@uppershape{italic}%
298 \def\@lowershape{italic}%
299 \def\@diacriticsshape{roman}%
300 \def\@greekuppershape{roman}%
301 \def\@greeklowershape{italic}%
302 \def\@agreekuppershape{roman}%
303 \def\@agreeklowershape{italic}%
304 \def\@cyrillicuppershape{roman}%
305 \def\@cyrilliclowershape{italic}%
306 \def\@hebrewshape{roman}%
307 \def\@digitsshape{roman}%
308 \def\@operatorshape{roman}%
309 \def\@symbolsshape{roman}%
310 \def\@extsymbolsshape{roman}%
311 \def\@delimitersshape{roman}%
312 \def\@arrowsshape{roman}%
313 \def\@bigopsshape{roman}%
314 \def\@extbigopsshape{roman}%
315 \def\@bbshape{roman}%
316 \def\@calshape{roman}%
317 \def\@frakshape{roman}%
318 \def\@bcalshape{roman}%
319 \def\@bfrakshape{roman}%
320 \def\@defaultkeys{upper,lower,diacritics,greekupper,greeklower,%
321   digits,symbols,operator}
322 \def\@normalkeys{upper,lower,diacritics,greekupper,greeklower,agreekupper,%
323   agreeklower,cyrillicupper,cyrilliclower,hebrew,digits,operator,symbols,%
324   extsymbols,delimiters,arrows,bigops,extbigops}
```

```
325 \def\@alphanumkeys{bb,cal,frak,bcal,bfrak}
```

4 Parse Input

The command `\M@check@option@valid` confirms that a user's keyword option is legitimate. The macro defines `\@temperror` to be an invalid option error and loops through all possible options. If the command argument matches one of the correct possibilities, the package changes `\@temperror` to `\relax`. The macro ends this process with a call to `\@temperror`, so the package issues an error if and only if the specified option is invalid. We switch the `\if@optionpresent` and `\if@suboptionpresent` booleans to true in these macros when the respective `\@for` loops match the prospective option or suboption to a valid choice. We have to initialize the blackboard, calligraphic, and fraktur commands separately because they don't use the same encoding-alphabet system as the regular letters and digits, and the `\define@<keyword>` macro does this.

```
326 \def\@check@option@valid#1{%
327   \def\@temperror{\M@InvalidOptionError{#1}}
328   \@for\@j:=\@normalkeys\do{%
329     \ifx\@j#1
330       \let\@temperror\relax
331       \Optionpresenttrue% set switch to true if option is valid
332       \advance\@return\@ne
333     \fi}
334 }
```

We have to initialize alphanumeric symbols separately.

```
334 \@for\@j:=\@alphanumkeys\do{%
335   \ifx\@j#1
336     \let\@temperror\relax
337     \expandafter\@CommandInitializeInfo\csname math\@j\endcsname
338     \csname define@\@j\endcsname% initialize
339     \Optionpresenttrue% set switch to true if option is valid
340     \advance\@return\@ne
341   \fi}
342 }
```

Do the same thing for the suboption.

```
343 \def\@check@suboption@valid#1{%
344   \def\@temperror{\M@InvalidSuboptionError{#1}}
345   \@for\@j:=roman,italic\do{%
346     \ifx\@j#1
347       \let\@temperror\relax
348       \Suboptionpresenttrue% set switch to true if suboption is valid
349       \advance\@return\@ne
350     \fi}
351 }
```

We want to allow the user to specify options using an `xkeyval`-type syntax. However, we do not need the full package; a slim 22 lines of code will suffice. When `\mathfont` reads one segment of `text` from its comma-delimited optional argument, it calls `\M@parse@option<text>=\@nil`.

The `\M@parse@option` macro splits the option and suboption by looking for the first `=`. It puts its `#1` argument in `\@tempa` and `#2` in `\@tempb` and then checks whether option and suboption are present and valid. If the user specifies a suboption, their *text* will contain an `=`, so the option ends up in `\@tempa` while `\@tempb` contains `<suboption>=`. Calling `\M@strip@equals` extracts the suboption. If the user does not specify a suboption, the user's *text* will not contain an `=`, and `\@tempb` will end up empty. We check for errors by determining whether (1) `\@tempa` is empty, meaning the user did not specify an option; (2) `\@tempb` is `=`, meaning the user did not specify a suboption; and (3) the contents of `\@tempa` and `\@tempb` correspond to valid options and suboptions. The macros `\M@check@option@valid` and `\M@check@suboption@valid` handle the last step.

```

352 \def\M@strip@equals#1={#1}
353 \def\M@parse@option#1=#2\@nil{%
354   \@optionpresentfalse% set switch to false by default
355   \@suboptionpresentfalse% set switch to false by default
356   \def\@tempa{#1}
357   \def\@tempb{#2}
358   \ifx\@tempa\@empty
359     \M@MissingOptionError
360   \else
361     \M@check@option@valid\@tempa
362     \def\@tempc{=}
363     \ifx\@tempb\@tempc
364       \M@MissingSuboptionError
365     \else
366       \ifx\@tempb\@empty
367         \else
368           \edef\@tempb{\expandafter\M@strip@equals\@tempb}
369           \M@check@suboption@valid\@tempb
370         \fi
371       \fi
372     \fi
373 }
```

Define a variant of `\zap@space` that will work with control sequences. Used for removing spaces from the optional argument of `\mathfont`.

```
373 \def\M@eat@spaces#1{\expandafter\zap@space#1 \@empty}
```

We end this section by coding a macro used later in error checking. Here `#1` is an argument that we expect to be a single token or set of tokens inside braces, so we check whether `#2` is empty. The parameters `#3` and `#4` correspond to an error and to the original command respectively.

```

374 \def\M@check@arglength#1#2\@nil#3#4{%
375   \ifx\@nnil#2\@nnil
376   \else
377     #3{#1#2}{#4}%
378     \M@arg@goodfalse
379   \fi}
```

5 Default Font Changes

The user-level command `\mathfont` functions as the main font-changing command. It takes no argument directly but rather checks for an optional argument and passes keyword information to the internal command `\@mathfont`. It scans next nonspace token using `\@ifnextchar` and determines whether it is a `[`. If yes, the user specified an optional argument, and the package converts the space character to catcode 9 before scanning the optional argument with `\m@thf@nt`. If no, the package calls `\@mathfont` directly with the default list of keywords stored in `\@defaultkeys`. The `\m@thf@nt` macro scans a single argument delimited by brackets, resets the catcode of spaces, and calls `\@mathfont` with the user's scanned and de-spaced argument. We put the catcode change inside a group to make it local.

The internal `\@mathfont` accepts two arguments: a list of keywords and suboptions #1 and a font name #2. The macro proceeds in several steps: (1) it checks if `\set@mathchar` has been reset, and if so, the current call to `\mathfont` does nothing; (2) the macro loads the user's font with `\@newfont` and stores the internal name in `\M@font<number>`; (3) it expands the optional argument with an `\edef` and stores it in `\@tempa`; and (5) it calls `\M@eat@spaces`, which is a wrapped version of `\zap@space`, on the contents of `\@tempa` to remove any spaces that remain after scanning with `\m@thf@nt`. At this point, the package is ready to parse the optional argument. It loops through the segments of #1 with `\@for` and calls `\M@parse@option<text>=\@nil` on each piece of text. If they exist, the argument keyword ends up in `\@tempa`, and the suboption goes into `\@tempb`. The macro punctuates `\M@toks` accordingly and then defines symbol fonts with the information from `\@tempa`, `\@tempb`, and the argument #2. Finally, the package calls `\M@<keyword>@set` to set the default font and changes the corresponding boolean from false to true.

The package stores each new font in a macro of the form `\M@font<number>`, where *number* is given by the current value of `\M@count`. The name of the corresponding symbol fonts is `M<shape><number>`, where *shape* is either `roman` or `italic` and *number* is again the value of `\M@count`. For each package keyword, the package defined `\@<keyword>shape` as the default shape in section 3, and if the user specifies a suboption for any keyword in the optional argument of `\mathfont`, the package overrides the default shape by redefining `\@<keyword>shape`. For example, if the user writes

```
\mathfont [upper=roman]{Zapfino}
```

immediately after loading `mathfont`, the package will define `\M@font0` to be the internal name of `Zapfino`, and the corresponding symbol font names will be `Mroman0` and `Mitalic0`. Because the user specified a suboption, `\@mathfont` redefines `\@uppershape` to the token string `roman`, and `mathfont` uses `\@uppershape` later to specify the symbol font for capital Latin characters. This happens inside `\@mathfont` when the package calls `\M@upper@set` and defines `\M@upper` as the expansion of `M\@uppershape\the\M@count`.

```
380 \def\mathfont{\@ifnextchar[% next line is the two possible branches
381   {\bgroup\catcode`\ =9\relax\m@thf@nt}{\@mathfont[\@defaultkeys]}}
382 \def\m@thf@nt [#1]{\egroup\@mathfont [#1]}
```

The internal default-font-changing command.

```
383 \def\@mathfont [#1]#2{%
384   \ifx\set@mathchar\@set@mathchar
```

```
385 \M@InternalsRestoredError
```

If the kernel commands have not been reset, we can do fun stuff.

```
386 \else
387   \M@return\thr@@
388   \M@toks{}
389   \M@mathfont@firstoptiontrue
```

Use `\@newfont` to load the user's font.

```
390 \wlog{Package mathfont Info: Loading font #2 with package fontspec.}
391 \expandafter\@newfont\csname M@font\the\M@count\endcsname{}{\#2}
```

Expand, zap spaces from, and store the optional argument in `\@tempa`, and then perform the loop. We store the current keyword-suboption pair in `\@i` and then feed it to `\M@parse@option`. We need two `\edefs` here because `\zap@space` appears before `\@tempa` in `\M@eat@spaces`. We expand the argument with the first `\edef` and remove the spaces with the second.

```
392 \edef\@tempa{\#1}
393 \edef\@tempa{\M@eat@spaces\@tempa}
394 \@for\@i:=\@tempa\do{\expandafter\@parse@option\@i=\@nil
395   \if@optionpresent
```

If the user calls `\mathfont` and tries multiple times to set the font for a certain class of characters, `mathfont` will issue a warning, and the package will not adjust the font for those characters. Notice the particularly awkward syntax with the `\csname-`endcsname` pairs. Without this construct, TeX won't realize that `\csname if@\@tempa\endcsname` matches the eventual `\fi`, and the `\@for` loop will break. (TeX does not have a smart if-parser!)

```
396 \expandafter\ifx% next line is two cs to be compared
397   \csname if@\@tempa\expandafter\endcsname\csname iftrue\endcsname
398   \M@CharsSetWarning{\@tempa}
```

The case where the keyword-option has not already been set. This will be (almost) all situations. We begin by punctuating the toks. The `\ifM@mathfont@firstoption` boolean is a bookkeeping variable that determines whether to add a `,` to the list of keywords in `\M@toks`, and `\M@return` counts how many keywords we have added to `\M@toks`. When this number gets high enough, we start a new line.

```
399 \else
400   \ifM@mathfont@firstoption
401     \M@mathfont@firstoptionfalse
402   \else
403     \ifnum\M@return>5\relax
404       \expandafter\@toks\expandafter{\the\M@toks, ^^J}
405       \M@return\z@
406     \else
407       \expandafter\@toks\expandafter{\the\M@toks, }
408     \fi
409   \fi
```

Add the keyword-option to the toks.

```
410 \edef\@tempc{\the\M@toks\@tempa}
411 \expandafter\@toks\expandafter{\@tempc}
```

Handle the case with a suboption.

```
412      \if@suboptionpresent
413          \expandafter\edef\csname @\@tempa shape\endcsname{\@tempb}
414          \edef\@tempc{\the\@toks\space(\@tempb)}
415          \expandafter\@toks\expandafter{\@tempc}
416      \fi
```

For either possible suboption, check whether the package has already declared that version of the current font for use in math mode using `\@ifundefined`. If not, do so.

```
417      \def\@tempb{roman}
418      \expandafter\ifx\csname @\@tempa shape\endcsname\@tempb
419          \@ifundefined{symMroman\the\@count}
420              {\DeclareSymbolFont{Mroman}\the\@count}{TU}
421              {\csname M@font\the\@count\endcsname}{m}{n}{}}
422      \fi
423      \def\@tempb{italic}
424      \expandafter\ifx\csname @\@tempa shape\endcsname\@tempb
425          \@ifundefined{symMitalic\the\@count}
426              {\DeclareSymbolFont{Mitalic}\the\@count}{TU}
427              {\csname M@font\the\@count\endcsname}{m}{it}{}}
428      \fi
```

Store the new font information so we can write it to the log file `\AtBeginDocument`.

```
429      \expandafter\edef\csname M@\@tempa @fontinfo\endcsname{#2}
430      \M@anychars@changedtrue
```

And now the magic happens.

```
431      \M@FontChangeInfo{\@tempa}{#2}
432      \csname M@\@tempa @set\endcsname% set default font
433      \csname @\@tempa true\endcsname% set switch to true
434      \fi
435  \fi}
```

Finally, advance `\M@count` and display messages for the user.

```
436      \advance\@tempa\@ne
437      \edef\@tempa{\the\@toks}
438      \ifx\@tempa\empty
439          \wlog{The \string\mathfont\space command on line \the\inputlineno\space
440              did not change the font for any characters!}
441      \else
442          \typeout{:: mathfont :: Math font set to #2\space
443              on line \the\inputlineno.}
444          \wlog{Character classes changed: \the\@toks.^^J}
445      \fi
446  \fi}
447 \onlypreamble\mathfont
448 \onlypreamble\mathfont
449 \onlypreamble\mathfont
```

We end the section by coding `\setfont`.

```
450 \def\setfont#1{\setmainfont[Ligatures=TeX]{#1}\mathfont{#1}}
451 \onlypreamble\setfont
```

6 Alphanumeric Symbols

Each `\define@{keyword}` macro redefines one of the standard `\math{keyword}` commands. The new versions first check if they are in math mode using `\M@check@mode` and then scan all tokens of their argument using `\@tfor`. For each token, the macro calls `\M@{keyword}@{token}`, which evaluates to a `\mathord` symbol in the desired style.

```
452 \def\M@check@mode#1{%
453   \let\@tempa#1%
454   \ifmmode
455     \expandafter\@tempa
456   \else
```

Temporarily change the escape character code to -1 so we can gobble the `@` in `\math{keyword}` without worrying about the escape character. We need to do this for error messaging purposes because `\M@HModeError` displays the user-level command that caused the error. Finally, the package adds a missing `$` in order to enter math mode.

```
457   \bgroup
458     \escapechar\m@ne
459     \expandafter
460   \egroup
461   \expandafter\M@HModeError\csname\expandafter\@gobble\string#1\endcsname
462   \leavevmode\expandafter$\expandafter\@tempa
463 \fi}
```

The `\M@process@tokens` macro turns the letters into alphanumeric symbols. This macro loops through the argument of the original `\math{keyword}` macro with `\@tfor` and calls `\M@check@token` on each `\@k` to validate the input. If the `token` is valid, `TeX` calls the corresponding `\M@{keyword}@{token}` math character command, and if not, `\M@check@token` will issue an error.

```
464 \def\M@process@tokens#1#2{%
465   \edef\@tempa{#1}%
466   \expandafter\@tfor\expandafter\@k\expandafter:\expandafter=\expandafter=\@tempa\do{%
467     \expandafter\M@check@token\expandafter{\@k}{#2}}%
```

And typeset the character. Error checking has set `\ifM@arg@good` to either true or false depending on whether `\@k` is a valid input or not.

```
468 \ifM@arg@good
469   \csname M@#2@\@k\endcsname
470 \fi}}
```

We check for errors with `\M@check@token`. The argument `#1` is the argument to be checked, and argument `#2` is a keyword that goes into warning messages. Checking happens in five steps: (1) verify `TeX` cannot split the contents of `#1` (which in `\M@process@tokens` is `\@k`) into multiple arguments; (2) verify that the argument does not begin with a character of

catcode 1, i.e. `{`; (3) verify that the token is not a control sequence; (4) check whether the character is a letter; and (5) if the argument does not have catcode 11, check that it's a number. If any of these checks fail, `mathfont` switches `\ifM@arg@good` from true to false and skips the remaining steps.

```
471 \def\check@token#1#{%
472   \M@arg@goodtrue
473   \M@check@arglength#1@nil\M@DoubleArgWarning{\csname math#2\endcsname}%
474   \ifM@arg@good% good
```

Checking for a nested argument involves what I think of as catcode jujitsu and inevitably feels super hacky. We use `\ifcat\bgroup` to check whether the first token of `#1` has catcode 1, and we take care to avoid unbalanced braces because `\ifcat` will eat the first token in the `#1` argument when it expands. If the comparison succeeds, the first token had catcode 1, and we are now missing a `{`. We place one before `\ifcat`, and we `\@gobble` the argument to prevent `TeX` from typesetting it. The extra left brace balances the final right brace in `#1`, and both tokens delimit the argument of `\@gobble`. If the comparison fails, `TeX` eliminates everything in the first branch, and we need to balance the `{` from before `\ifcat`. Thus we add a right brace immediately after `\else`, and the argument of `\@gobble` ends up being empty.

```
475   \expandafter\@gobble\expandafter{\ifcat\bgroup#1% bad
476     \M@NestedArgWarning{#1}{\csname math#2\endcsname}%
477     \M@arg@goodfalse
478   \else}%
```

Check whether `#1` is a control sequence.

```
479   \ifcat\relax\noexpand#1% bad
480     \M@ControlSequenceArgWarning{#1}{\csname math#2\endcsname}%
481     \M@arg@goodfalse
482   \else
```

Check that `#1` is a letter.

```
483   \ifcat a#1% good
484   \else
```

Finally, check that `#1` is a digit.

```
485   \if 0#1% good
486   \else
487     \if 1#1% good
488     \else
489       \if 2#1% good
490       \else
491         \if 3#1% good
492         \else
493           \if 4#1% good
494           \else
495             \if 5#1% good
496             \else
497               \if 6#1% good
498               \else
```

```

499          \if 7#1% good
500          \else
501              \if 8#1% good
502              \else
503                  \if 9#1% good
504                  \else

```

If all checks fail, issue a warning and switch `\ifM@arg@good` to false.

```

505          \M@CharacterArgWarning
506              {#1}{\csname math#2\endcsname}%
507          \M@arg@goodfalse
508          \fi
509          \fi
510          \fi
511          \fi
512          \fi
513          \fi
514          \fi
515          \fi
516          \fi
517          \fi
518          \fi
519          \fi
520      \fi
521  \fi}

```

Now initialize the five commands. We start with the blackboard-bold font-changing command.

```

522 \def\define@bb{%
523   \def\mathbb{\M@check@mode\@mathbb}%
524   \def\@mathbb##1{\M@process@tokens{##1}{bb}}}

```

Calligraphic characters.

```

525 \def\define@cal{%
526   \def\mathcal{\M@check@mode\@mathcal}%
527   \def\@mathcal##1{\M@process@tokens{##1}{cal}}}

```

Fraktur characters.

```

528 \def\define@frak{%
529   \def\mathfrak{\M@check@mode\@mathfrak}%
530   \def\@mathfrak##1{\M@process@tokens{##1}{frak}}}

```

Bold calligraphic characters.

```

531 \def\define@bcal{%
532   \def\mathbcal{\M@check@mode\@mathbcal}%
533   \def\@mathbcal##1{\M@process@tokens{##1}{bcal}}}

```

Bold fraktur characters.

```

534 \def\define@bfrak{%
535   \def\mathbfrak{\M@check@mode\@mathbfrak}%
536   \def\@mathbfrak##1{\M@process@tokens{##1}{bfrak}}}

```

7 Local Font Changes

The general `\newmathfontcommand` macro creates commands that locally change the math font. This macro creates a new math alphabet, and it stores that alphabet in the user-provided control sequence. The way `\M@check@csarg` scans the following tokens is a bit tricky. For error messaging purposes, its first argument should be the control sequence that called it. Error checking happens in two stages: (1) check the length of the argument using `\M@check@arglength`; and (2) check that the argument is a control sequence. If the user specifies an argument of the form `{..}`, i.e. extra text inside braces, the `\ifcat` will catch it and issue an error. If `\M@check@csarg` likes the input, the macro passes it to `\@newmathfontcommand`, which behaves like `\DeclareMathAlphabet`, and if the error checking is unsuccessful, the command gobbles the next two arguments in the input stream.

```

537 \def\@check@csarg#1#2#3{%
538   \M@arg@goodtrue
539   \M@check@arglength#2\@nil\M@DoubleArgError{#1}
540   \ifM@arg@good% good
541     \ifcat\relax\noexpand#2% good
542   \else
543     \M@MissingControlSequenceError{#1}{#2}
544     \M@arg@goodfalse
545   \fi
546 \fi
547 \ifM@arg@good
548   \def\@tempa{#2}
549   \wlog{Package mathfont Info: Loading font #3 with package fontspec.}
550   \@newfont\@tempb{}{#3}
551   \expandafter\@newmathfontcommand
552 \else
553   \expandafter\@gobbletwo
554 \fi}
555 \@onlypreamble\@check@csarg

```

Now declare the math alphabet. This macro has just two parameters because we call it inside `\M@check@csarg` when `\@tempa` and `\@tempb` already have definitions.

```

556 \def\@newmathfontcommand#1#2{%
557   \expandafter\M@NewFontCommandInfo\expandafter
558   {\@tempa}{\@tempb}{#1}{#2}
559   \expandafter\DeclareMathAlphabet\expandafter
560   {\@tempa}{TU}{\@tempb}{#1}{#2}}
561 \def\newmathfontcommand{\@check@csarg\newmathfontcommand}
562 \@onlypreamble\@newmathfontcommand
563 \@onlypreamble\newmathfontcommand

```

Then provide the four default versions.

```

564 \def\newmathrm#1#2{\@check@csarg\newmathrm{#1}{#2}
565   {\mddefault}{\updefault}}
566 \def\newmathit#1#2{\@check@csarg\newmathit{#1}{#2}
567   {\mddefault}{\itdefault}}

```

```

568 \def\newmathbf#1#2{\M@check@csarg\newmathbf{#1}{#2}
569   {\bfdefault}{\updefault}}
570 \def\newmathbfit#1#2{\M@check@csarg\newmathbfit{#1}{#2}
571   {\bfdefault}{\itdefault}}
572 \@onlypreamble\newmathrm
573 \@onlypreamble\newmathit
574 \@onlypreamble\newmathbf
575 \@onlypreamble\newmathbfit

```

We provide `\newmathbold` and `\newmathboldit` for backwards compatibility but issue a warning.

```

576 \def\newmathbold{%
577   \M@DepreciatedWarning\newmathbold\newmathbf
578   \newmathbf}
579 \def\newmathboldit{%
580   \M@DepreciatedWarning\newmathboldit\newmathbfit
581   \newmathbfit}

```

8 Concluding Material

Provide the command to reset macros.

```

582 \def\restoremathinternals{%
583   \ifx\set@mathchar\@set@mathchar
584   \else
585     \M@RestoreInternalsInfo
586   \fi
587   \let\set@mathchar\@set@mathchar
588   \let\set@mathsymbol\@set@mathsymbol
589   \let\set@mathaccent\@set@mathaccent}

```

We write to the log file `\AtBeginDocument` all font changes carried out by `mathfont`.

```

590 \def\keyword@info@begindocument#1{%
591   \expandafter\ifx% next line is two cs to be compared
592     \csname if@#1\expandafter\endcsname\csname iftrue\endcsname
593   \wlog{Keyword #1: Set to \csname M@#1@fontinfo\endcsname\space with
594     \csname @#1shape\endcsname\space shape.}
595   \else
596     \wlog{Keyword #1: No change.}
597   \fi}
598 \AtBeginDocument{%
599   \ifM@nychars@changed
600     \edef@\tempa{\@normalkeys,\@alphanumkeys}
601     \wlog{^^J:: mathfont :: List of fonts changed by mathfont:}
602     \for@\i:=\tempa\do{%
603       \expandafter\keyword@info@begindocument\expandafter{\@i}}
604     \wlog{}}
605   \else

```

```
606   \wlog{^^J:: mathfont :: No fonts were changed by mathfont.^^J}
607 \fi}
```

Some fonts do not contain characters that `mathfont` can declare as math symbols. We want to make sure that if this happens, TeX prints a message in the log file.

```
608 \tracinglostchars=1
```

Warn the user about possible problems with a multi-word optional argument in XeTeX.

```
609 \ifx\XeTeXrevision\@undefined
610 \else
611   \ifM@font@loaded
612     \AtEndOfPackage{%
613       \PackageWarningNoLine{mathfont}
614       {XeTeX detected. It looks like you\MessageBreak
615        specified a font when you loaded\MessageBreak
616        mathfont. If you run into problems\MessageBreak
617        with a font whose name is multiple\MessageBreak
618        words, try compiling with LuaLaTeX\MessageBreak
619        instead or call \string\setfont\space
620        or \string\mathfont\MessageBreak manually}}
621   \fi
622 \fi
```

If the user passed a font name to `mathfont`, we set it as the default `\AtEndOfPackage`.

```
623 \ifM@font@loaded
624   \AtEndOfPackage{%
625     \setfont\M@font@load
626     \newmathrm\mathrm\M@font@load
627     \newmathit\mathit\M@font@load
628     \newmathbf\mathbf\M@font@load
629     \newmathbfit\mathbfit\M@font@load}
630 \fi
```

Warn the user about possible cosmetic issues arising from a clash with the `align` environment from the `amsmath` package.

```
631 \AtBeginDocument{%
632   \if@bb
633     \@ifpackageloaded{amsmath}{\PackageWarningNoLine{mathfont}
634       {Package amsmath detected. Some warning\MessageBreak
635        messages for \string\mathbb\space may be duplicated\MessageBreak
636        inside the align environment}}{}}
637 \fi
638 \if@cal
639   \@ifpackageloaded{amsmath}{\PackageWarningNoLine{mathfont}
640     {Package amsmath detected. Some warning\MessageBreak
641      messages for \string\mathcal\space may be duplicated\MessageBreak
642      inside the align environment}}{}}
643 \fi
644 \if@frak
645   \@ifpackageloaded{amsmath}{\PackageWarningNoLine{mathfont}
```

```

646 {Package amsmath detected. Some warning\MessageBreak
647 messages for \string\mathfrak\space may be duplicated\MessageBreak
648 inside the align environment}{}}
649 \fi
650 \if@bcal
651   \@ifpackageloaded{amsmath}{\PackageWarningNoLine{mathfont}}
652   {Package amsmath detected. Some warning\MessageBreak
653   messages for \string\mathbcal\space may be duplicated\MessageBreak
654   inside the align environment}{}}
655 \fi
656 \if@bfrak
657   \@ifpackageloaded{amsmath}{\PackageWarningNoLine{mathfont}}
658   {Package amsmath detected. Some warning\MessageBreak
659   messages for \string\mathbfrak\space may be duplicated\MessageBreak
660   inside the align environment}{}}
661 \fi

```

Finally, make all character-setting commands inaccessible outside the preamble.

```

662 \@onlypreamble\@upper@set
663 \@onlypreamble\@lower@set
664 \@onlypreamble\@diacritics@set
665 \@onlypreamble\@greekupper@set
666 \@onlypreamble\@greeklower@set
667 \@onlypreamble\@agreekupper@set
668 \@onlypreamble\@agreeklower@set
669 \@onlypreamble\@cyrillicupper@set
670 \@onlypreamble\@cyrilliclower@set
671 \@onlypreamble\@hebrew@set
672 \@onlypreamble\@digits@set
673 \@onlypreamble\@operator@set
674 \@onlypreamble\@symbols@set
675 \@onlypreamble\@extsymbols@set
676 \@onlypreamble\@delimiters@set
677 \@onlypreamble\@arrows@set
678 \@onlypreamble\@bigops@set
679 \@onlypreamble\@extbigops@set
680 \@onlypreamble\@bb@set
681 \@onlypreamble\@cal@set
682 \@onlypreamble\@frak@set
683 \@onlypreamble\@bcal@set
684 \@onlypreamble\@bfrak@set

```

9 Unicode Hex Values

Set capital Latin characters. We use an `\edef` for `\M@upper` because every expansion now will save L^AT_EX twenty-six expansions later when it evaluates each `\DeclareMathSymbol`.

```
685 \def\@upper@set{%
```

```

686 \edef\mathcal{\upper{M}\cuppershape\the\mathcount}
687 \DeclareMathSymbol{A}{\mathalpha}{\mathcal}{`A}
688 \DeclareMathSymbol{B}{\mathalpha}{\mathcal}{`B}
689 \DeclareMathSymbol{C}{\mathalpha}{\mathcal}{`C}
690 \DeclareMathSymbol{D}{\mathalpha}{\mathcal}{`D}
691 \DeclareMathSymbol{E}{\mathalpha}{\mathcal}{`E}
692 \DeclareMathSymbol{F}{\mathalpha}{\mathcal}{`F}
693 \DeclareMathSymbol{G}{\mathalpha}{\mathcal}{`G}
694 \DeclareMathSymbol{H}{\mathalpha}{\mathcal}{`H}
695 \DeclareMathSymbol{I}{\mathalpha}{\mathcal}{`I}
696 \DeclareMathSymbol{J}{\mathalpha}{\mathcal}{`J}
697 \DeclareMathSymbol{K}{\mathalpha}{\mathcal}{`K}
698 \DeclareMathSymbol{L}{\mathalpha}{\mathcal}{`L}
699 \DeclareMathSymbol{M}{\mathalpha}{\mathcal}{`M}
700 \DeclareMathSymbol{N}{\mathalpha}{\mathcal}{`N}
701 \DeclareMathSymbol{O}{\mathalpha}{\mathcal}{`O}
702 \DeclareMathSymbol{P}{\mathalpha}{\mathcal}{`P}
703 \DeclareMathSymbol{Q}{\mathalpha}{\mathcal}{`Q}
704 \DeclareMathSymbol{R}{\mathalpha}{\mathcal}{`R}
705 \DeclareMathSymbol{S}{\mathalpha}{\mathcal}{`S}
706 \DeclareMathSymbol{T}{\mathalpha}{\mathcal}{`T}
707 \DeclareMathSymbol{U}{\mathalpha}{\mathcal}{`U}
708 \DeclareMathSymbol{V}{\mathalpha}{\mathcal}{`V}
709 \DeclareMathSymbol{W}{\mathalpha}{\mathcal}{`W}
710 \DeclareMathSymbol{X}{\mathalpha}{\mathcal}{`X}
711 \DeclareMathSymbol{Y}{\mathalpha}{\mathcal}{`Y}
712 \DeclareMathSymbol{Z}{\mathalpha}{\mathcal}{`Z}}

```

Set minuscule Latin characters.

```

713 \def\mathcal@set{%
714   \edef\mathcal{\lower{M}\clowershape\the\mathcount}
715   \DeclareMathSymbol{a}{\mathalpha}{\mathcal}{`a}
716   \DeclareMathSymbol{b}{\mathalpha}{\mathcal}{`b}
717   \DeclareMathSymbol{c}{\mathalpha}{\mathcal}{`c}
718   \DeclareMathSymbol{d}{\mathalpha}{\mathcal}{`d}
719   \DeclareMathSymbol{e}{\mathalpha}{\mathcal}{`e}
720   \DeclareMathSymbol{f}{\mathalpha}{\mathcal}{`f}
721   \DeclareMathSymbol{g}{\mathalpha}{\mathcal}{`g}
722   \DeclareMathSymbol{h}{\mathalpha}{\mathcal}{`h}
723   \DeclareMathSymbol{i}{\mathalpha}{\mathcal}{`i}
724   \DeclareMathSymbol{\imath}{\mathalpha}{\mathcal}{`131}
725   \DeclareMathSymbol{j}{\mathalpha}{\mathcal}{`j}
726   \DeclareMathSymbol{\jmath}{\mathalpha}{\mathcal}{`237}
727   \DeclareMathSymbol{k}{\mathalpha}{\mathcal}{`k}
728   \DeclareMathSymbol{l}{\mathalpha}{\mathcal}{`l}
729   \DeclareMathSymbol{m}{\mathalpha}{\mathcal}{`m}
730   \DeclareMathSymbol{n}{\mathalpha}{\mathcal}{`n}
731   \DeclareMathSymbol{o}{\mathalpha}{\mathcal}{`o}}

```

```

732 \DeclareMathSymbol{p}{\mathalpha}{\M@lower}{`p}
733 \DeclareMathSymbol{q}{\mathalpha}{\M@lower}{`q}
734 \DeclareMathSymbol{r}{\mathalpha}{\M@lower}{`r}
735 \DeclareMathSymbol{s}{\mathalpha}{\M@lower}{`s}
736 \DeclareMathSymbol{t}{\mathalpha}{\M@lower}{`t}
737 \DeclareMathSymbol{u}{\mathalpha}{\M@lower}{`u}
738 \DeclareMathSymbol{v}{\mathalpha}{\M@lower}{`v}
739 \DeclareMathSymbol{w}{\mathalpha}{\M@lower}{`w}
740 \DeclareMathSymbol{x}{\mathalpha}{\M@lower}{`x}
741 \DeclareMathSymbol{y}{\mathalpha}{\M@lower}{`y}
742 \DeclareMathSymbol{z}{\mathalpha}{\M@lower}{`z}}

```

Set diacritics.

```

743 \def\M@diacritics@set{%
744   \edef\M@diacritics{\M@diacriticsshape\the\ M@count}
745   \DeclareMathAccent{\acute}{\mathalpha}{\M@diacritics}{B4}
746   \DeclareMathAccent{\aaacute}{\mathalpha}{\M@diacritics}{2DD}
747   \DeclareMathAccent{\dot}{\mathalpha}{\M@diacritics}{2D9}
748   \DeclareMathAccent{\ddot}{\mathalpha}{\M@diacritics}{A8}
749   \DeclareMathAccent{\grave}{\mathalpha}{\M@diacritics}{60}
750   \DeclareMathAccent{\breve}{\mathalpha}{\M@diacritics}{2D8}
751   \DeclareMathAccent{\hat}{\mathalpha}{\M@diacritics}{2C6}
752   \DeclareMathAccent{\check}{\mathalpha}{\M@diacritics}{2C7}
753   \DeclareMathAccent{\bar}{\mathalpha}{\M@diacritics}{AF}
754   \DeclareMathAccent{\mathring}{\mathalpha}{\M@diacritics}{2DA}
755   \DeclareMathAccent{\tilde}{\mathalpha}{\M@diacritics}{2DC}}

```

Set capital Greek characters.

```

756 \def\M@greekupper@set{%
757   \edef\M@greekupper{\M@greekuppershape\the\ M@count}
758   \DeclareMathSymbol{\Alpha}{\mathalpha}{\M@greekupper}{391}
759   \DeclareMathSymbol{\Beta}{\mathalpha}{\M@greekupper}{392}
760   \DeclareMathSymbol{\Gamma}{\mathalpha}{\M@greekupper}{393}
761   \DeclareMathSymbol{\Delta}{\mathalpha}{\M@greekupper}{394}
762   \DeclareMathSymbol{\Epsilon}{\mathalpha}{\M@greekupper}{395}
763   \DeclareMathSymbol{\Zeta}{\mathalpha}{\M@greekupper}{396}
764   \DeclareMathSymbol{\Eta}{\mathalpha}{\M@greekupper}{397}
765   \DeclareMathSymbol{\Theta}{\mathalpha}{\M@greekupper}{398}
766   \DeclareMathSymbol{\Iota}{\mathalpha}{\M@greekupper}{399}
767   \DeclareMathSymbol{\Kappa}{\mathalpha}{\M@greekupper}{39A}
768   \DeclareMathSymbol{\Lambda}{\mathalpha}{\M@greekupper}{39B}
769   \DeclareMathSymbol{\Mu}{\mathalpha}{\M@greekupper}{39C}
770   \DeclareMathSymbol{\Nu}{\mathalpha}{\M@greekupper}{39D}
771   \DeclareMathSymbol{\Xi}{\mathalpha}{\M@greekupper}{39E}
772   \DeclareMathSymbol{\Omicron}{\mathalpha}{\M@greekupper}{39F}
773   \DeclareMathSymbol{\Pi}{\mathalpha}{\M@greekupper}{3A0}
774   \DeclareMathSymbol{\Rho}{\mathalpha}{\M@greekupper}{3A1}
775   \DeclareMathSymbol{\Sigma}{\mathalpha}{\M@greekupper}{3A3}
776   \DeclareMathSymbol{\Tau}{\mathalpha}{\M@greekupper}{3A4}}

```

```

777 \DeclareMathSymbol{\Upsilon}{\mathalpha}{\M@greekupper}{3A5}
778 \DeclareMathSymbol{\Phi}{\mathalpha}{\M@greekupper}{3A6}
779 \DeclareMathSymbol{\Chi}{\mathalpha}{\M@greekupper}{3A7}
780 \DeclareMathSymbol{\Psi}{\mathalpha}{\M@greekupper}{3A8}
781 \DeclareMathSymbol{\Omega}{\mathalpha}{\M@greekupper}{3A9}
782 \DeclareMathSymbol{\varTheta}{\mathalpha}{\M@greekupper}{3F4}

```

Set minuscule Greek characters.

```

783 \def\M@greeklower@set{%
784   \edef\M@greeklower{M@\greeklowershape\the\M@count}
785   \DeclareMathSymbol{\alpha}{\mathalpha}{\M@greeklower}{3B1}
786   \DeclareMathSymbol{\beta}{\mathalpha}{\M@greeklower}{3B2}
787   \DeclareMathSymbol{\gamma}{\mathalpha}{\M@greeklower}{3B3}
788   \DeclareMathSymbol{\delta}{\mathalpha}{\M@greeklower}{3B4}
789   \DeclareMathSymbol{\epsilon}{\mathalpha}{\M@greeklower}{3F5}
790   \DeclareMathSymbol{\zeta}{\mathalpha}{\M@greeklower}{3B6}
791   \DeclareMathSymbol{\eta}{\mathalpha}{\M@greeklower}{3B7}
792   \DeclareMathSymbol{\theta}{\mathalpha}{\M@greeklower}{3B8}
793   \DeclareMathSymbol{\iota}{\mathalpha}{\M@greeklower}{3B9}
794   \DeclareMathSymbol{\kappa}{\mathalpha}{\M@greeklower}{3BA}
795   \DeclareMathSymbol{\lambda}{\mathalpha}{\M@greeklower}{3BB}
796   \DeclareMathSymbol{\mu}{\mathalpha}{\M@greeklower}{3BC}
797   \DeclareMathSymbol{\nu}{\mathalpha}{\M@greeklower}{3BD}
798   \DeclareMathSymbol{\xi}{\mathalpha}{\M@greeklower}{3BE}
799   \DeclareMathSymbol{\omicron}{\mathalpha}{\M@greeklower}{3BF}
800   \DeclareMathSymbol{\pi}{\mathalpha}{\M@greeklower}{3C0}
801   \DeclareMathSymbol{\rho}{\mathalpha}{\M@greeklower}{3C1}
802   \DeclareMathSymbol{\sigma}{\mathalpha}{\M@greeklower}{3C3}
803   \DeclareMathSymbol{\tau}{\mathalpha}{\M@greeklower}{3C4}
804   \DeclareMathSymbol{\upsilon}{\mathalpha}{\M@greeklower}{3C5}
805   \DeclareMathSymbol{\phi}{\mathalpha}{\M@greeklower}{3D5}
806   \DeclareMathSymbol{\chi}{\mathalpha}{\M@greeklower}{3C7}
807   \DeclareMathSymbol{\psi}{\mathalpha}{\M@greeklower}{3C8}
808   \DeclareMathSymbol{\omega}{\mathalpha}{\M@greeklower}{3C9}
809   \DeclareMathSymbol{\varbeta}{\mathalpha}{\M@greeklower}{3D0}
810   \DeclareMathSymbol{\varepsilon}{\mathalpha}{\M@greeklower}{3B5}
811   \DeclareMathSymbol{\vartheta}{\mathalpha}{\M@greeklower}{3D1}
812   \DeclareMathSymbol{\varrho}{\mathalpha}{\M@greeklower}{3F1}
813   \DeclareMathSymbol{\varsigma}{\mathalpha}{\M@greeklower}{3C2}
814   \DeclareMathSymbol{\varphi}{\mathalpha}{\M@greeklower}{3C6}}

```

Set capital ancient Greek characters.

```

815 \def\M@agreekupper@set{%
816   \edef\M@agreekupper{M@\greekuppershape\the\M@count}
817   \DeclareMathSymbol{\Heta}{\mathalpha}{\M@agreekupper}{370}
818   \DeclareMathSymbol{\Sampi}{\mathalpha}{\M@agreekupper}{3E0}
819   \DeclareMathSymbol{\Digamma}{\mathalpha}{\M@agreekupper}{3DC}
820   \DeclareMathSymbol{\Koppa}{\mathalpha}{\M@agreekupper}{3D8}
821   \DeclareMathSymbol{\Stigma}{\mathalpha}{\M@agreekupper}{3DA}

```

```

822 \DeclareMathSymbol{\Sho}{\mathalpha}{\M@agreekupper}{3F7}
823 \DeclareMathSymbol{\San}{\mathalpha}{\M@agreekupper}{3FA}
824 \DeclareMathSymbol{\varSampi}{\mathalpha}{\M@agreekupper}{372}
825 \DeclareMathSymbol{\varDigamma}{\mathalpha}{\M@agreekupper}{376}
826 \DeclareMathSymbol{\varKoppa}{\mathalpha}{\M@agreekupper}{3DE}

```

Set minuscule ancient Greek characters.

```

827 \def\M@agreeklower@set{%
828   \edef\mathalpha{\M@agreeklowershape\the\count}
829   \DeclareMathSymbol{\heta}{\mathalpha}{\M@agreeklower}{371}
830   \DeclareMathSymbol{\sampi}{\mathalpha}{\M@agreeklower}{3E1}
831   \DeclareMathSymbol{\digamma}{\mathalpha}{\M@agreeklower}{3DD}
832   \DeclareMathSymbol{\koppa}{\mathalpha}{\M@agreeklower}{3D9}
833   \DeclareMathSymbol{\stigma}{\mathalpha}{\M@agreeklower}{3DB}
834   \DeclareMathSymbol{\sho}{\mathalpha}{\M@agreeklower}{3F8}
835   \DeclareMathSymbol{\san}{\mathalpha}{\M@agreeklower}{3FB}
836   \DeclareMathSymbol{\varsampi}{\mathalpha}{\M@agreeklower}{373}
837   \DeclareMathSymbol{\vardigamma}{\mathalpha}{\M@agreeklower}{377}
838   \DeclareMathSymbol{\varkoppa}{\mathalpha}{\M@agreeklower}{3DF}}

```

Set capital Cyrillic characters.

```

839 \def\M@cyrillicupper@set{%
840   \edef\mathalpha{\M@cyrillicuppershape\the\count}
841   \DeclareMathSymbol{\cyrA}{\mathalpha}{\M@cyrillicupper}{410}
842   \DeclareMathSymbol{\cyrBe}{\mathalpha}{\M@cyrillicupper}{411}
843   \DeclareMathSymbol{\cyrVe}{\mathalpha}{\M@cyrillicupper}{412}
844   \DeclareMathSymbol{\cyrGhe}{\mathalpha}{\M@cyrillicupper}{413}
845   \DeclareMathSymbol{\cyrDe}{\mathalpha}{\M@cyrillicupper}{414}
846   \DeclareMathSymbol{\cyrIe}{\mathalpha}{\M@cyrillicupper}{415}
847   \DeclareMathSymbol{\cyrZhe}{\mathalpha}{\M@cyrillicupper}{416}
848   \DeclareMathSymbol{\cyrZe}{\mathalpha}{\M@cyrillicupper}{417}
849   \DeclareMathSymbol{\cyrI}{\mathalpha}{\M@cyrillicupper}{418}
850   \DeclareMathSymbol{\cyrKa}{\mathalpha}{\M@cyrillicupper}{41A}
851   \DeclareMathSymbol{\cyrEl}{\mathalpha}{\M@cyrillicupper}{41B}
852   \DeclareMathSymbol{\cyrEm}{\mathalpha}{\M@cyrillicupper}{41C}
853   \DeclareMathSymbol{\cyrEn}{\mathalpha}{\M@cyrillicupper}{41D}
854   \DeclareMathSymbol{\cyrO}{\mathalpha}{\M@cyrillicupper}{41E}
855   \DeclareMathSymbol{\cyrPe}{\mathalpha}{\M@cyrillicupper}{41F}
856   \DeclareMathSymbol{\cyrEr}{\mathalpha}{\M@cyrillicupper}{420}
857   \DeclareMathSymbol{\cyrEs}{\mathalpha}{\M@cyrillicupper}{421}
858   \DeclareMathSymbol{\cyrTe}{\mathalpha}{\M@cyrillicupper}{422}
859   \DeclareMathSymbol{\cyrU}{\mathalpha}{\M@cyrillicupper}{423}
860   \DeclareMathSymbol{\cyrEf}{\mathalpha}{\M@cyrillicupper}{424}
861   \DeclareMathSymbol{\cyrHa}{\mathalpha}{\M@cyrillicupper}{425}
862   \DeclareMathSymbol{\cyrTse}{\mathalpha}{\M@cyrillicupper}{426}
863   \DeclareMathSymbol{\cyrChe}{\mathalpha}{\M@cyrillicupper}{427}
864   \DeclareMathSymbol{\cyrSha}{\mathalpha}{\M@cyrillicupper}{428}
865   \DeclareMathSymbol{\cyrShcha}{\mathalpha}{\M@cyrillicupper}{429}
866   \DeclareMathSymbol{\cyrHard}{\mathalpha}{\M@cyrillicupper}{42A}}

```

```

867 \DeclareMathSymbol{\cyrYeru}{\mathalpha}{\M@cyrillicupper}{42B}
868 \DeclareMathSymbol{\cyrSoft}{\mathalpha}{\M@cyrillicupper}{42C}
869 \DeclareMathSymbol{\cyrE}{\mathalpha}{\M@cyrillicupper}{42D}
870 \DeclareMathSymbol{\cyrYu}{\mathalpha}{\M@cyrillicupper}{42E}
871 \DeclareMathSymbol{\cyrYa}{\mathalpha}{\M@cyrillicupper}{42F}
872 \DeclareMathSymbol{\cyrvarI}{\mathalpha}{\M@cyrillicupper}{419}

```

Set minuscule Cyrillic characters.

```

873 \def\M@cyrilliclower@set{%
874   \edef\M@cyrilliclower{M@cyrilliclowershape\the\M@count}
875   \DeclareMathSymbol{\cyra}{\mathalpha}{\M@cyrilliclower}{430}
876   \DeclareMathSymbol{\cyrbe}{\mathalpha}{\M@cyrilliclower}{431}
877   \DeclareMathSymbol{\cyrve}{\mathalpha}{\M@cyrilliclower}{432}
878   \DeclareMathSymbol{\cyrghe}{\mathalpha}{\M@cyrilliclower}{433}
879   \DeclareMathSymbol{\cyrde}{\mathalpha}{\M@cyrilliclower}{434}
880   \DeclareMathSymbol{\cyrie}{\mathalpha}{\M@cyrilliclower}{435}
881   \DeclareMathSymbol{\cyrzhe}{\mathalpha}{\M@cyrilliclower}{436}
882   \DeclareMathSymbol{\cyrze}{\mathalpha}{\M@cyrilliclower}{437}
883   \DeclareMathSymbol{\cyri}{\mathalpha}{\M@cyrilliclower}{438}
884   \DeclareMathSymbol{\cyrka}{\mathalpha}{\M@cyrilliclower}{43A}
885   \DeclareMathSymbol{\cyrel}{\mathalpha}{\M@cyrilliclower}{43B}
886   \DeclareMathSymbol{\cyrem}{\mathalpha}{\M@cyrilliclower}{43C}
887   \DeclareMathSymbol{\cyren}{\mathalpha}{\M@cyrilliclower}{43D}
888   \DeclareMathSymbol{\cyro}{\mathalpha}{\M@cyrilliclower}{43E}
889   \DeclareMathSymbol{\cyrpe}{\mathalpha}{\M@cyrilliclower}{43F}
890   \DeclareMathSymbol{\cyrer}{\mathalpha}{\M@cyrilliclower}{440}
891   \DeclareMathSymbol{\cyres}{\mathalpha}{\M@cyrilliclower}{441}
892   \DeclareMathSymbol{\cyrte}{\mathalpha}{\M@cyrilliclower}{442}
893   \DeclareMathSymbol{\cyrus}{\mathalpha}{\M@cyrilliclower}{443}
894   \DeclareMathSymbol{\cyref}{\mathalpha}{\M@cyrilliclower}{444}
895   \DeclareMathSymbol{\cyrha}{\mathalpha}{\M@cyrilliclower}{445}
896   \DeclareMathSymbol{\cyrtse}{\mathalpha}{\M@cyrilliclower}{446}
897   \DeclareMathSymbol{\cyrche}{\mathalpha}{\M@cyrilliclower}{447}
898   \DeclareMathSymbol{\cyrsha}{\mathalpha}{\M@cyrilliclower}{448}
899   \DeclareMathSymbol{\cyrshcha}{\mathalpha}{\M@cyrilliclower}{449}
900   \DeclareMathSymbol{\cyrhard}{\mathalpha}{\M@cyrilliclower}{44A}
901   \DeclareMathSymbol{\cyryeru}{\mathalpha}{\M@cyrilliclower}{44B}
902   \DeclareMathSymbol{\cyrsoft}{\mathalpha}{\M@cyrilliclower}{44C}
903   \DeclareMathSymbol{\cyre}{\mathalpha}{\M@cyrilliclower}{44D}
904   \DeclareMathSymbol{\cyryu}{\mathalpha}{\M@cyrilliclower}{44E}
905   \DeclareMathSymbol{\cyrya}{\mathalpha}{\M@cyrilliclower}{44F}
906   \DeclareMathSymbol{\cyrvari}{\mathalpha}{\M@cyrilliclower}{439}}

```

Set Hebrew characters.

```

907 \def\M@hebrew@set{%
908   \edef\M@hebrew{M@hebrewshape\the\M@count}
909   \DeclareMathSymbol{\aleph}{\mathalpha}{\M@hebrew}{5D0}
910   \DeclareMathSymbol{\beth}{\mathalpha}{\M@hebrew}{5D1}
911   \DeclareMathSymbol{\gimel}{\mathalpha}{\M@hebrew}{5D2}

```

```

912 \DeclareMathSymbol{\daleth}{\mathalpha}{\M@hebrew}{5D3}
913 \DeclareMathSymbol{\he}{\mathalpha}{\M@hebrew}{5D4}
914 \DeclareMathSymbol{\vav}{\mathalpha}{\M@hebrew}{5D5}
915 \DeclareMathSymbol{\zayin}{\mathalpha}{\M@hebrew}{5D6}
916 \DeclareMathSymbol{\het}{\mathalpha}{\M@hebrew}{5D7}
917 \DeclareMathSymbol{\tet}{\mathalpha}{\M@hebrew}{5D8}
918 \DeclareMathSymbol{\yod}{\mathalpha}{\M@hebrew}{5D9}
919 \DeclareMathSymbol{\kaf}{\mathalpha}{\M@hebrew}{5DB}
920 \DeclareMathSymbol{\lamed}{\mathalpha}{\M@hebrew}{5DC}
921 \DeclareMathSymbol{\mem}{\mathalpha}{\M@hebrew}{5DE}
922 \DeclareMathSymbol{\nun}{\mathalpha}{\M@hebrew}{5E0}
923 \DeclareMathSymbol{\samekh}{\mathalpha}{\M@hebrew}{5E1}
924 \DeclareMathSymbol{\ayin}{\mathalpha}{\M@hebrew}{5E2}
925 \DeclareMathSymbol{\pe}{\mathalpha}{\M@hebrew}{5E4}
926 \DeclareMathSymbol{\tsadi}{\mathalpha}{\M@hebrew}{5E6}
927 \DeclareMathSymbol{\qof}{\mathalpha}{\M@hebrew}{5E7}
928 \DeclareMathSymbol{\resh}{\mathalpha}{\M@hebrew}{5E8}
929 \DeclareMathSymbol{\shin}{\mathalpha}{\M@hebrew}{5E9}
930 \DeclareMathSymbol{\tav}{\mathalpha}{\M@hebrew}{5EA}
931 \DeclareMathSymbol{\varkaf}{\mathalpha}{\M@hebrew}{5DA}
932 \DeclareMathSymbol{\varmem}{\mathalpha}{\M@hebrew}{5DD}
933 \DeclareMathSymbol{\varnun}{\mathalpha}{\M@hebrew}{5DF}
934 \DeclareMathSymbol{\varpe}{\mathalpha}{\M@hebrew}{5E3}
935 \DeclareMathSymbol{\vartsadi}{\mathalpha}{\M@hebrew}{5E5}}

```

Set digits.

```

936 \def\M@digits@set{%
937   \edef\M@digits{M@digitsshape\the\M@count}
938   \DeclareMathSymbol{0}{\mathalpha}{\M@digits}{`0}
939   \DeclareMathSymbol{1}{\mathalpha}{\M@digits}{`1}
940   \DeclareMathSymbol{2}{\mathalpha}{\M@digits}{`2}
941   \DeclareMathSymbol{3}{\mathalpha}{\M@digits}{`3}
942   \DeclareMathSymbol{4}{\mathalpha}{\M@digits}{`4}
943   \DeclareMathSymbol{5}{\mathalpha}{\M@digits}{`5}
944   \DeclareMathSymbol{6}{\mathalpha}{\M@digits}{`6}
945   \DeclareMathSymbol{7}{\mathalpha}{\M@digits}{`7}
946   \DeclareMathSymbol{8}{\mathalpha}{\M@digits}{`8}
947   \DeclareMathSymbol{9}{\mathalpha}{\M@digits}{`9}}

```

Set new operator font.

```

948 \def\M@operator@set{%
949   \edef\operator@font{\noexpand\mathgroup
950     \expandafter\noexpand\csname symM@operatorshape\the\M@count\endcsname}}

```

Set symbols.

```

951 \def\M@symbols@set{%
952   \edef\M@symbols{M@symbolsshape\the\M@count}
953   \let\colon\@undefined
954   \let\mathellipsis\@undefined

```

```

955 \DeclareMathSymbol{.}{\mathord}{\M@symbols}{"2E}
956 \DeclareMathSymbol{@}{\mathord}{\M@symbols}{"40}
957 \DeclareMathSymbol{\mathhash}{\mathord}{\M@symbols}{"23}
958 \DeclareMathSymbol{\mathdollar}{\mathord}{\M@symbols}{"24}
959 \DeclareMathSymbol{\mathpercent}{\mathord}{\M@symbols}{"25}
960 \DeclareMathSymbol{\mathand}{\mathord}{\M@symbols}{"26}
961 \DeclareMathSymbol{\mathparagraph}{\mathord}{\M@symbols}{"B6}
962 \DeclareMathSymbol{\mathsection}{\mathord}{\M@symbols}{"A7}
963 \DeclareMathSymbol{\mathsterling}{\mathord}{\M@symbols}{"A3}
964 \DeclareMathSymbol{|}{\mathord}{\M@symbols}{"7C}
965 \DeclareMathSymbol{\neg}{\mathord}{\M@symbols}{"AC}
966 \DeclareMathSymbol{\infty}{\mathord}{\M@symbols}{"221E}
967 \DeclareMathSymbol{\partial}{\mathord}{\M@symbols}{"2202}
968 \DeclareMathSymbol{\mathbackslash}{\mathord}{\M@symbols}{"5C}
969 \DeclareMathSymbol{\degree}{\mathord}{\M@symbols}{"B0}
970 \DeclareMathSymbol{\increment}{\mathord}{\M@symbols}{"2206}
971 \DeclareMathSymbol{\hbar}{\mathord}{\M@symbols}{"127}
972 \DeclareMathSymbol{'}{\mathord}{\M@symbols}{"2032}
973 \DeclareMathSymbol{"}{\mathord}{\M@symbols}{"2033}
974 \DeclareMathSymbol{\comma}{\mathord}{\M@symbols}{"2C}
975 \DeclareMathSymbol{+}{\mathbin}{\M@symbols}{"2B}
976 \DeclareMathSymbol{-}{\mathbin}{\M@symbols}{"2212}
977 \DeclareMathSymbol{*}{\mathbin}{\M@symbols}{"2A}
978 \DeclareMathSymbol{\times}{\mathbin}{\M@symbols}{"D7}
979 \DeclareMathSymbol{/}{\mathbin}{\M@symbols}{"2215}
980 \DeclareMathSymbol{\div}{\mathbin}{\M@symbols}{"F7}
981 \DeclareMathSymbol{\pm}{\mathbin}{\M@symbols}{"B1}
982 \DeclareMathSymbol{\bullet}{\mathbin}{\M@symbols}{"2022}
983 \DeclareMathSymbol{\dagger}{\mathbin}{\M@symbols}{"2020}
984 \DeclareMathSymbol{\ddagger}{\mathbin}{\M@symbols}{"2021}
985 \DeclareMathSymbol{\cdot}{\mathbin}{\M@symbols}{"2219}
986 \DeclareMathSymbol{\setminus}{\mathbin}{\M@symbols}{"5C}
987 \DeclareMathSymbol{=}{\mathrel}{\M@symbols}{"3D}
988 \DeclareMathSymbol{<}{\mathrel}{\M@symbols}{"3C}
989 \DeclareMathSymbol{>}{\mathrel}{\M@symbols}{"3E}
990 \DeclareMathSymbol{\leq}{\mathrel}{\M@symbols}{"2264}
991 \DeclareMathSymbol{\geq}{\mathrel}{\M@symbols}{"2265}
992 \DeclareMathSymbol{\sim}{\mathrel}{\M@symbols}{"7E}
993 \DeclareMathSymbol{\approx}{\mathrel}{\M@symbols}{"2248}
994 \DeclareMathSymbol{\equiv}{\mathrel}{\M@symbols}{"2261}
995 \DeclareMathSymbol{\mid}{\mathrel}{\M@symbols}{"7C}
996 \DeclareMathSymbol{\parallel}{\mathrel}{\M@symbols}{"2016}
997 \DeclareMathSymbol{:}{\mathrel}{\M@symbols}{"3A}
998 \DeclareMathSymbol{?}{\mathclose}{\M@symbols}{"3F}
999 \DeclareMathSymbol{!}{\mathclose}{\M@symbols}{"21}
1000 \DeclareMathSymbol{,}{\mathpunct}{\M@symbols}{"2C}
1001 \DeclareMathSymbol{;}{\mathpunct}{\M@symbols}{"3B}

```

```

1002 \DeclareMathSymbol{\colon}{\mathpunct}{\M@symbols}{3A}
1003 \DeclareMathSymbol{\mathellipsis}{\mathinner}{\M@symbols}{2026}

```

Finally a bit of housekeeping. We redefine \#, \%, and \& as robust commands that expand to previously declared \mathhash, etc. commands in math mode and retain their standard \char definitions otherwise. Other commands that function in both math and horizontal modes such as \S or \dag also use this technique. The last three commands defined here preserve the Computer Modern font for characters used in several math-mode symbols.

```

1004 \DeclareRobustCommand{\#}{\ifmmode\mathhash\else\char"23\relax\fi}
1005 \DeclareRobustCommand{\%}{\ifmmode\mathpercent\else\char"25\relax\fi}
1006 \DeclareRobustCommand{\&}{\ifmmode\mathand\else\char"26\relax\fi}
1007 \DeclareMathSymbol{\@relbar}{\mathbin}{symbols}{00}
1008 \DeclareMathSymbol{\@Relbar}{\mathrel}{operators}{3D}
1009 \DeclareMathSymbol{\@verticalbar}{\mathord}{symbols}{6A}
1010 \DeclareRobustCommand{\relbar}{\mathrel{\smash{\@relbar}}}
1011 \DeclareRobustCommand{\Relbar}{\mathrel{\@Relbar}}
1012 \DeclareRobustCommand{\models}{\mathrel{\@verticalbar}\joinrel\Relbar}}

```

Set extended symbols.

```

1013 \def\@extsymbols@set{%
1014   \edef\@extsymbols{M@\@extsymbolshape\the\@count}
1015   \let\angle\@undefined
1016   \let\sqsubset\@undefined
1017   \let\sqsupset\@undefined
1018   \let\bowtie\@undefined
1019   \let\doteq\@undefined
1020   \let\neq\@undefined
1021   \let\ng\@undefined
1022   \DeclareMathSymbol{\wp}{\mathord}{\@extsymbols}{2118}
1023   \DeclareMathSymbol{\Re}{\mathord}{\@extsymbols}{211C}
1024   \DeclareMathSymbol{\Im}{\mathord}{\@extsymbols}{2111}
1025   \DeclareMathSymbol{\ell}{\mathord}{\@extsymbols}{2113}
1026   \DeclareMathSymbol{\forall}{\mathord}{\@extsymbols}{2200}
1027   \DeclareMathSymbol{\exists}{\mathord}{\@extsymbols}{2203}
1028   \DeclareMathSymbol{\emptyset}{\mathord}{\@extsymbols}{2205}
1029   \DeclareMathSymbol{\nabla}{\mathord}{\@extsymbols}{2207}
1030   \DeclareMathSymbol{\in}{\mathord}{\@extsymbols}{2208}
1031   \DeclareMathSymbol{\ni}{\mathord}{\@extsymbols}{220B}
1032   \DeclareMathSymbol{\mp}{\mathord}{\@extsymbols}{2213}
1033   \DeclareMathSymbol{\angle}{\mathord}{\@extsymbols}{2220}
1034   \DeclareMathSymbol{\top}{\mathord}{\@extsymbols}{22A4}
1035   \DeclareMathSymbol{\bot}{\mathord}{\@extsymbols}{22A5}
1036   \DeclareMathSymbol{\vdash}{\mathord}{\@extsymbols}{22A2}
1037   \DeclareMathSymbol{\dashv}{\mathord}{\@extsymbols}{22A3}
1038   \DeclareMathSymbol{\flat}{\mathord}{\@extsymbols}{266D}
1039   \DeclareMathSymbol{\natural}{\mathord}{\@extsymbols}{266E}
1040   \DeclareMathSymbol{\sharp}{\mathord}{\@extsymbols}{266F}
1041   \DeclareMathSymbol{\fflat}{\mathord}{\@extsymbols}{1D12B}
}

```

```

1042 \DeclareMathSymbol{\sssharp}{\mathord}{\M@extsymbols}{1D12A}
1043 \DeclareMathSymbol{\bclubsuit}{\mathord}{\M@extsymbols}{2663}
1044   \let\clubsuit\bclubsuit
1045 \DeclareMathSymbol{\bdiamondsuit}{\mathord}{\M@extsymbols}{2666}
1046 \DeclareMathSymbol{\bheartsuit}{\mathord}{\M@extsymbols}{2665}
1047 \DeclareMathSymbol{\bspadesuit}{\mathord}{\M@extsymbols}{2660}
1048   \let\spadesuit\bspadesuit
1049 \DeclareMathSymbol{\wclubsuit}{\mathord}{\M@extsymbols}{2667}
1050 \DeclareMathSymbol{\wdiamondsuit}{\mathord}{\M@extsymbols}{2662}
1051   \let\diamondsuit\wdiamondsuit
1052 \DeclareMathSymbol{\wheartsuit}{\mathord}{\M@extsymbols}{2661}
1053   \let\heartsuit\wheartsuit
1054 \DeclareMathSymbol{\wspadesuit}{\mathord}{\M@extsymbols}{2664}
1055 \DeclareMathSymbol{\wedge}{\mathbin}{\M@extsymbols}{2227}
1056 \DeclareMathSymbol{\vee}{\mathbin}{\M@extsymbols}{2228}
1057 \DeclareMathSymbol{\cap}{\mathord}{\M@extsymbols}{2229}
1058 \DeclareMathSymbol{\cup}{\mathbin}{\M@extsymbols}{222A}
1059 \DeclareMathSymbol{\sqcap}{\mathbin}{\M@extsymbols}{2293}
1060 \DeclareMathSymbol{\sqcup}{\mathbin}{\M@extsymbols}{2294}
1061 \DeclareMathSymbol{\amalg}{\mathbin}{\M@extsymbols}{2A3F}
1062 \DeclareMathSymbol{\wr}{\mathbin}{\M@extsymbols}{2240}
1063 \DeclareMathSymbol{\ast}{\mathbin}{\M@extsymbols}{2217}
1064 \DeclareMathSymbol{\star}{\mathbin}{\M@extsymbols}{22C6}
1065 \DeclareMathSymbol{\diamond}{\mathbin}{\M@extsymbols}{22C4}
1066 \DeclareMathSymbol{\vardot}{\mathbin}{\M@extsymbols}{22C5}
1067 \DeclareMathSymbol{\varsetminus}{\mathbin}{\M@extsymbols}{2216}
1068 \DeclareMathSymbol{\oplus}{\mathbin}{\M@extsymbols}{2295}
1069 \DeclareMathSymbol{\otimes}{\mathbin}{\M@extsymbols}{2297}
1070 \DeclareMathSymbol{\ominus}{\mathbin}{\M@extsymbols}{2296}
1071 \DeclareMathSymbol{\odiv}{\mathbin}{\M@extsymbols}{2A38}
1072 \DeclareMathSymbol{\oslash}{\mathbin}{\M@extsymbols}{2298}
1073 \DeclareMathSymbol{\odot}{\mathbin}{\M@extsymbols}{2299}
1074 \DeclareMathSymbol{\sqplus}{\mathbin}{\M@extsymbols}{229E}
1075 \DeclareMathSymbol{\sqtimes}{\mathbin}{\M@extsymbols}{22A0}
1076 \DeclareMathSymbol{\sqminus}{\mathbin}{\M@extsymbols}{229F}
1077 \DeclareMathSymbol{\sqdot}{\mathbin}{\M@extsymbols}{22A1}
1078 \DeclareMathSymbol{\in}{\mathrel}{\M@extsymbols}{2208}
1079 \DeclareMathSymbol{\ni}{\mathrel}{\M@extsymbols}{220B}
1080 \DeclareMathSymbol{\subset}{\mathrel}{\M@extsymbols}{2282}
1081 \DeclareMathSymbol{\supset}{\mathrel}{\M@extsymbols}{2283}
1082 \DeclareMathSymbol{\subseteqq}{\mathrel}{\M@extsymbols}{2286}
1083 \DeclareMathSymbol{\supseteqq}{\mathrel}{\M@extsymbols}{2287}
1084 \DeclareMathSymbol{\sqsubset}{\mathrel}{\M@extsymbols}{228F}
1085 \DeclareMathSymbol{\sqsupset}{\mathrel}{\M@extsymbols}{2290}
1086 \DeclareMathSymbol{\sqsubseteqq}{\mathrel}{\M@extsymbols}{2291}
1087 \DeclareMathSymbol{\sqsupseteqq}{\mathrel}{\M@extsymbols}{2292}
1088 \DeclareMathSymbol{\triangleleft}{\mathrel}{\M@extsymbols}{22B2}

```

```

1089 \DeclareMathSymbol{\triangleright}{\mathrel}{\M@extsymbols}{"22B3}
1090 \DeclareMathSymbol{\trianglelefteq}{\mathrel}{\M@extsymbols}{"22B4}
1091 \DeclareMathSymbol{\trianglerighteq}{\mathrel}{\M@extsymbols}{"22B5}
1092 \DeclareMathSymbol{\propto}{\mathrel}{\M@extsymbols}{"221D}
1093 \DeclareMathSymbol{\bowtie}{\mathrel}{\M@extsymbols}{"22C8}
1094 \DeclareMathSymbol{\hourglass}{\mathrel}{\M@extsymbols}{"29D6}
1095 \DeclareMathSymbol{\therefore}{\mathrel}{\M@extsymbols}{"2234}
1096 \DeclareMathSymbol{\because}{\mathrel}{\M@extsymbols}{"2235}
1097 \DeclareMathSymbol{\ratio}{\mathrel}{\M@extsymbols}{"2236}
1098 \DeclareMathSymbol{\proportion}{\mathrel}{\M@extsymbols}{"2237}
1099 \DeclareMathSymbol{\ll}{\mathrel}{\M@extsymbols}{"226A}
1100 \DeclareMathSymbol{\gg}{\mathrel}{\M@extsymbols}{"226B}
1101 \DeclareMathSymbol{\lll}{\mathrel}{\M@extsymbols}{"22D8}
1102 \DeclareMathSymbol{\ggg}{\mathrel}{\M@extsymbols}{"22D9}
1103 \DeclareMathSymbol{\leqq}{\mathrel}{\M@extsymbols}{"2266}
1104 \DeclareMathSymbol{\geqq}{\mathrel}{\M@extsymbols}{"2267}
1105 \DeclareMathSymbol{\lapprox}{\mathrel}{\M@extsymbols}{"2A85}
1106 \DeclareMathSymbol{\gapprox}{\mathrel}{\M@extsymbols}{"2A86}
1107 \DeclareMathSymbol{\simeq}{\mathrel}{\M@extsymbols}{"2243}
1108 \DeclareMathSymbol{\eqsim}{\mathrel}{\M@extsymbols}{"2242}
1109 \DeclareMathSymbol{\simeqq}{\mathrel}{\M@extsymbols}{"2245}
1110     \let\cong\simeqq
1111 \DeclareMathSymbol{\approxeq}{\mathrel}{\M@extsymbols}{"224A}
1112 \DeclareMathSymbol{\ssim}{\mathrel}{\M@extsymbols}{"224B}
1113 \DeclareMathSymbol{\seq}{\mathrel}{\M@extsymbols}{"224C}
1114 \DeclareMathSymbol{\doteq}{\mathrel}{\M@extsymbols}{"2250}
1115 \DeclareMathSymbol{\coloneq}{\mathrel}{\M@extsymbols}{"2254}
1116 \DeclareMathSymbol{\eqcolon}{\mathrel}{\M@extsymbols}{"2255}
1117 \DeclareMathSymbol{\ringeq}{\mathrel}{\M@extsymbols}{"2257}
1118 \DeclareMathSymbol{\arceq}{\mathrel}{\M@extsymbols}{"2258}
1119 \DeclareMathSymbol{\wedgeeq}{\mathrel}{\M@extsymbols}{"2259}
1120 \DeclareMathSymbol{\veeeq}{\mathrel}{\M@extsymbols}{"225A}
1121 \DeclareMathSymbol{\stareq}{\mathrel}{\M@extsymbols}{"225B}
1122 \DeclareMathSymbol{\triangleeq}{\mathrel}{\M@extsymbols}{"225C}
1123 \DeclareMathSymbol{\defeq}{\mathrel}{\M@extsymbols}{"225D}
1124 \DeclareMathSymbol{\qeq}{\mathrel}{\M@extsymbols}{"225F}
1125 \DeclareMathSymbol{\lsim}{\mathrel}{\M@extsymbols}{"2272}
1126 \DeclareMathSymbol{\gsim}{\mathrel}{\M@extsymbols}{"2273}
1127 \DeclareMathSymbol{\prec}{\mathrel}{\M@extsymbols}{"227A}
1128 \DeclareMathSymbol{\succ}{\mathrel}{\M@extsymbols}{"227B}
1129 \DeclareMathSymbol{\preceq}{\mathrel}{\M@extsymbols}{"227C}
1130 \DeclareMathSymbol{\succeq}{\mathrel}{\M@extsymbols}{"227D}
1131 \DeclareMathSymbol{\preceqq}{\mathrel}{\M@extsymbols}{"2AB3}
1132 \DeclareMathSymbol{\succeqq}{\mathrel}{\M@extsymbols}{"2AB4}
1133 \DeclareMathSymbol{\precsim}{\mathrel}{\M@extsymbols}{"227E}
1134 \DeclareMathSymbol{\succsim}{\mathrel}{\M@extsymbols}{"227F}
1135 \DeclareMathSymbol{\precapprox}{\mathrel}{\M@extsymbols}{"2AB7}

```

```

1136 \DeclareMathSymbol{\succapprox}{\mathrel}{\M@extsymbols}{"2AB8}
1137 \DeclareMathSymbol{\precprec}{\mathrel}{\M@extsymbols}{"2ABB}
1138 \DeclareMathSymbol{\succsucc}{\mathrel}{\M@extsymbols}{"2ABC}
1139 \DeclareMathSymbol{\asymp}{\mathrel}{\M@extsymbols}{"224D}
1140 \DeclareMathSymbol{\nin}{\mathrel}{\M@extsymbols}{"2209}
1141 \DeclareMathSymbol{\nni}{\mathrel}{\M@extsymbols}{"220C}
1142 \DeclareMathSymbol{\nsubset}{\mathrel}{\M@extsymbols}{"2284}
1143 \DeclareMathSymbol{\nsupset}{\mathrel}{\M@extsymbols}{"2285}
1144 \DeclareMathSymbol{\nsubseteqq}{\mathrel}{\M@extsymbols}{"2288}
1145 \DeclareMathSymbol{\nsupseteqq}{\mathrel}{\M@extsymbols}{"2289}
1146 \DeclareMathSymbol{\subsetneq}{\mathrel}{\M@extsymbols}{"228A}
1147 \DeclareMathSymbol{\supsetneq}{\mathrel}{\M@extsymbols}{"228B}
1148 \DeclareMathSymbol{\nsqsubseteqq}{\mathrel}{\M@extsymbols}{"22E2}
1149 \DeclareMathSymbol{\nsqsupseteqq}{\mathrel}{\M@extsymbols}{"22E3}
1150 \DeclareMathSymbol{\sqsubsetneq}{\mathrel}{\M@extsymbols}{"22E4}
1151 \DeclareMathSymbol{\sqsupsetneq}{\mathrel}{\M@extsymbols}{"22E5}
1152 \DeclareMathSymbol{\neq}{\mathrel}{\M@extsymbols}{"2260}
1153 \DeclareMathSymbol{\nl}{\mathrel}{\M@extsymbols}{"226E}
1154 \DeclareMathSymbol{\ng}{\mathrel}{\M@extsymbols}{"226F}
1155 \DeclareMathSymbol{\nleq}{\mathrel}{\M@extsymbols}{"2270}
1156 \DeclareMathSymbol{\ngeq}{\mathrel}{\M@extsymbols}{"2271}
1157 \DeclareMathSymbol{\lneq}{\mathrel}{\M@extsymbols}{"2A87}
1158 \DeclareMathSymbol{\gneq}{\mathrel}{\M@extsymbols}{"2A88}
1159 \DeclareMathSymbol{\lneqq}{\mathrel}{\M@extsymbols}{"2268}
1160 \DeclareMathSymbol{\gneqq}{\mathrel}{\M@extsymbols}{"2269}
1161 \DeclareMathSymbol{\ntriangleleft}{\mathrel}{\M@extsymbols}{"22EA}
1162 \DeclareMathSymbol{\ntriangleright}{\mathrel}{\M@extsymbols}{"22EB}
1163 \DeclareMathSymbol{\ntrianglelefteq}{\mathrel}{\M@extsymbols}{"22EC}
1164 \DeclareMathSymbol{\ntrianglerighteq}{\mathrel}{\M@extsymbols}{"22ED}
1165 \DeclareMathSymbol{\nsim}{\mathrel}{\M@extsymbols}{"2241}
1166 \DeclareMathSymbol{\napprox}{\mathrel}{\M@extsymbols}{"2249}
1167 \DeclareMathSymbol{\nsimeq}{\mathrel}{\M@extsymbols}{"2244}
1168 \DeclareMathSymbol{\nsimeqq}{\mathrel}{\M@extsymbols}{"2247}
1169 \DeclareMathSymbol{\simneqq}{\mathrel}{\M@extsymbols}{"2246}
1170 \DeclareMathSymbol{\nlsim}{\mathrel}{\M@extsymbols}{"2274}
1171 \DeclareMathSymbol{\ngsim}{\mathrel}{\M@extsymbols}{"2275}
1172 \DeclareMathSymbol{\lnsim}{\mathrel}{\M@extsymbols}{"22E6}
1173 \DeclareMathSymbol{\gnsim}{\mathrel}{\M@extsymbols}{"22E7}
1174 \DeclareMathSymbol{\lnapprox}{\mathrel}{\M@extsymbols}{"2A89}
1175 \DeclareMathSymbol{\gnapprox}{\mathrel}{\M@extsymbols}{"2A8A}
1176 \DeclareMathSymbol{\nprec}{\mathrel}{\M@extsymbols}{"2280}
1177 \DeclareMathSymbol{\nsucc}{\mathrel}{\M@extsymbols}{"2281}
1178 \DeclareMathSymbol{\npreceq}{\mathrel}{\M@extsymbols}{"22E0}
1179 \DeclareMathSymbol{\nsucceq}{\mathrel}{\M@extsymbols}{"22E1}
1180 \DeclareMathSymbol{\precneq}{\mathrel}{\M@extsymbols}{"2AB1}
1181 \DeclareMathSymbol{\succneq}{\mathrel}{\M@extsymbols}{"2AB2}
1182 \DeclareMathSymbol{\precneqq}{\mathrel}{\M@extsymbols}{"2AB5}

```

```

1183 \DeclareMathSymbol{\succneqq}{\mathrel}{\M@extsymbols}{"2AB6}
1184 \DeclareMathSymbol{\precnsim}{\mathrel}{\M@extsymbols}{"22E8}
1185 \DeclareMathSymbol{\succcnsim}{\mathrel}{\M@extsymbols}{"22E9}
1186 \DeclareMathSymbol{\precnapprox}{\mathrel}{\M@extsymbols}{"2AB9}
1187 \DeclareMathSymbol{\succnaprox}{\mathrel}{\M@extsymbols}{"2ABA}
1188 \DeclareMathSymbol{\nequiv}{\mathrel}{\M@extsymbols}{"2262}}

```

Set delimiters.

```

1189 \def\M@delimiters@set{%
1190   \edef\M@delimiters{M@\delimitersshape\the\M@count}
1191   \DeclareMathSymbol{\{}{\mathopen}{\M@delimiters}{"28}
1192   \DeclareMathSymbol{\}}{\mathclose}{\M@delimiters}{"29}
1193   \DeclareMathSymbol{\[]{\mathopen}{\M@delimiters}{"5B}
1194   \DeclareMathSymbol{\]}{\mathclose}{\M@delimiters}{"5D}
1195   \DeclareMathSymbol{\leftbrace}{\mathopen}{\M@delimiters}{"7B}
1196   \DeclareMathSymbol{\rightbrace}{\mathclose}{\M@delimiters}{"7D}}

```

Set arrows.

```

1197 \def\M@arrows@set{%
1198   \edef\M@arrows{M@\arrowsshape\the\M@count}
1199   \let\uparrow\@undefined
1200   \let\Uparrow\@undefined
1201   \let\downarrow\@undefined
1202   \let\Downarrow\@undefined
1203   \let\updownarrow\@undefined
1204   \let\Updownarrow\@undefined
1205   \let\longrightarrow\@undefined
1206   \let\longleftarrow\@undefined
1207   \let\longleftrightarrow\@undefined
1208   \let\hookrightarrow\@undefined
1209   \let\hookleftarrow\@undefined
1210   \let\Longrightarrow\@undefined
1211   \let\Longleftarrow\@undefined
1212   \let\Longleftrightarrow\@undefined
1213   \let\rightleftharpoons\@undefined
1214   \DeclareMathSymbol{\rightarrow}{\mathrel}{\M@arrows}{"2192}
1215     \let\to\rightarrow
1216   \DeclareMathSymbol{\nrightarrow}{\mathrel}{\M@arrows}{"219B}
1217   \DeclareMathSymbol{\Rightarrow}{\mathrel}{\M@arrows}{"21D2}
1218   \DeclareMathSymbol{\nRightarrow}{\mathrel}{\M@arrows}{"21CF}
1219   \DeclareMathSymbol{\Rrightarrow}{\mathrel}{\M@arrows}{"21DB}
1220   \DeclareMathSymbol{\longrightarrow}{\mathrel}{\M@arrows}{"27F6}
1221   \DeclareMathSymbol{\Longrightarrow}{\mathrel}{\M@arrows}{"27F9}
1222   \DeclareMathSymbol{\rightarrowbar}{\mathrel}{\M@arrows}{"21A6}
1223     \let\mapsto\rightarrowbar
1224   \DeclareMathSymbol{\Rightbararrow}{\mathrel}{\M@arrows}{"2907}
1225   \DeclareMathSymbol{\longrightarrowbar}{\mathrel}{\M@arrows}{"27FC}
1226     \let\longmapsto\longrightarrowbar
1227   \DeclareMathSymbol{\Longrightarrowbar}{\mathrel}{\M@arrows}{"27FE}

```

```

1228 \DeclareMathSymbol{\hookrightarrowarrow}{\mathrel}{\M@arrows}{"21AA}
1229 \DeclareMathSymbol{\rightdasharrow}{\mathrel}{\M@arrows}{"21E2}
1230 \DeclareMathSymbol{\rightharpoonup}{\mathrel}{\M@arrows}{"21C0}
1231 \DeclareMathSymbol{\rightharpoondown}{\mathrel}{\M@arrows}{"21C1}
1232 \DeclareMathSymbol{\rightarrowtail}{\mathrel}{\M@arrows}{"21A3}
1233 \DeclareMathSymbol{\rightarrowplusarrow}{\mathrel}{\M@arrows}{"27F4}
1234 \DeclareMathSymbol{\rightwavearrow}{\mathrel}{\M@arrows}{"219D}
1235 \DeclareMathSymbol{\rightsquigarrow}{\mathrel}{\M@arrows}{"21DD}
1236 \DeclareMathSymbol{\longrightsquigarrow}{\mathrel}{\M@arrows}{"27FF}
1237 \DeclareMathSymbol{\looparrowright}{\mathrel}{\M@arrows}{"21AC}
1238 \DeclareMathSymbol{\curvearrowright}{\mathrel}{\M@arrows}{"293B}
1239 \DeclareMathSymbol{\circlearrowright}{\mathrel}{\M@arrows}{"21BB}
1240 \DeclareMathSymbol{\twoheadrightarrow}{\mathrel}{\M@arrows}{"21AO}
1241 \DeclareMathSymbol{\rightarrowbar}{\mathrel}{\M@arrows}{"21E5}
1242 \DeclareMathSymbol{\whitearrow}{\mathrel}{\M@arrows}{"21E8}
1243 \DeclareMathSymbol{\rightrightarrows}{\mathrel}{\M@arrows}{"21C9}
1244 \DeclareMathSymbol{\rightrightrightarrows}{\mathrel}{\M@arrows}{"21F6}
1245 \DeclareMathSymbol{\leftarrow}{\mathrel}{\M@arrows}{"2190}
1246     \let\from\leftarrow
1247 \DeclareMathSymbol{\nleftarrow}{\mathrel}{\M@arrows}{"219A}
1248 \DeclareMathSymbol{\Leftarrow}{\mathrel}{\M@arrows}{"21D0}
1249 \DeclareMathSymbol{\nLeftarrow}{\mathrel}{\M@arrows}{"21CD}
1250 \DeclareMathSymbol{\Lleftarrow}{\mathrel}{\M@arrows}{"21DA}
1251 \DeclareMathSymbol{\longleftarrow}{\mathrel}{\M@arrows}{"27F5}
1252 \DeclareMathSymbol{\Longleftarrow}{\mathrel}{\M@arrows}{"27F8}
1253 \DeclareMathSymbol{\leftbararrow}{\mathrel}{\M@arrows}{"21A4}
1254     \let\mapsfrom\leftbararrow
1255 \DeclareMathSymbol{\Leftbararrow}{\mathrel}{\M@arrows}{"2906}
1256 \DeclareMathSymbol{\longleftbararrow}{\mathrel}{\M@arrows}{"27FB}
1257     \let\longmapsfrom\longleftbararrow
1258 \DeclareMathSymbol{\Longleftbararrow}{\mathrel}{\M@arrows}{"27FD}
1259 \DeclareMathSymbol{\hookleftarrow}{\mathrel}{\M@arrows}{"21A9}
1260 \DeclareMathSymbol{\leftdasharrow}{\mathrel}{\M@arrows}{"21E0}
1261 \DeclareMathSymbol{\leftharpoonup}{\mathrel}{\M@arrows}{"21C0}
1262 \DeclareMathSymbol{\leftharpoondown}{\mathrel}{\M@arrows}{"21C1}
1263 \DeclareMathSymbol{\leftarrowtail}{\mathrel}{\M@arrows}{"21A2}
1264 \DeclareMathSymbol{\leftplusarrow}{\mathrel}{\M@arrows}{"2B32}
1265 \DeclareMathSymbol{\leftwavearrow}{\mathrel}{\M@arrows}{"219C}
1266 \DeclareMathSymbol{\leftsquigarrow}{\mathrel}{\M@arrows}{"21DC}
1267 \DeclareMathSymbol{\longleftsquigarrow}{\mathrel}{\M@arrows}{"2B33}
1268 \DeclareMathSymbol{\looparrowleft}{\mathrel}{\M@arrows}{"21AB}
1269 \DeclareMathSymbol{\curvearrowleft}{\mathrel}{\M@arrows}{"293A}
1270 \DeclareMathSymbol{\circlearrowleft}{\mathrel}{\M@arrows}{"21BA}
1271 \DeclareMathSymbol{\twoheadleftarrow}{\mathrel}{\M@arrows}{"219E}
1272 \DeclareMathSymbol{\leftarrowbar}{\mathrel}{\M@arrows}{"21E4}
1273 \DeclareMathSymbol{\leftwhitearrow}{\mathrel}{\M@arrows}{"21E6}
1274 \DeclareMathSymbol{\leftleftarrows}{\mathrel}{\M@arrows}{"21C7}

```

```

1275 \DeclareMathSymbol{\leftleftleftarrows}{\mathrel}{\M@arrows}{"2B31}
1276 \DeclareMathSymbol{\leftrightarrow}{\mathrel}{\M@arrows}{"2194}
1277 \DeclareMathSymbol{\Leftrightarrow}{\mathrel}{\M@arrows}{"21D4}
1278 \DeclareMathSymbol{\nLeftrightarrow}{\mathrel}{\M@arrows}{"21CE}
1279 \DeclareMathSymbol{\longleftrightarrow}{\mathrel}{\M@arrows}{"27F7}
1280 \DeclareMathSymbol{\Longleftrightarrow}{\mathrel}{\M@arrows}{"27FA}
1281 \DeclareMathSymbol{\leftrightwavearrow}{\mathrel}{\M@arrows}{"21AD}
1282 \DeclareMathSymbol{\leftrightarrows}{\mathrel}{\M@arrows}{"21C6}
1283 \DeclareMathSymbol{\leftrightharpoons}{\mathrel}{\M@arrows}{"21CB}
1284 \DeclareMathSymbol{\leftrightarrowstobar}{\mathrel}{\M@arrows}{"21B9}
1285 \DeclareMathSymbol{\rightleftarrows}{\mathrel}{\M@arrows}{"21C4}
1286 \DeclareMathSymbol{\rightleftharpoons}{\mathrel}{\M@arrows}{"21CC}
1287 \DeclareMathSymbol{\uparrowarrow}{\mathrel}{\M@arrows}{"2191}
1288 \DeclareMathSymbol{\Uparrow}{\mathrel}{\M@arrows}{"21D1}
1289 \DeclareMathSymbol{\Uparrow}{\mathrel}{\M@arrows}{"290A}
1290 \DeclareMathSymbol{\upbararrow}{\mathrel}{\M@arrows}{"21A5}
1291 \DeclareMathSymbol{\updasharrow}{\mathrel}{\M@arrows}{"21E1}
1292 \DeclareMathSymbol{\upharpoonleft}{\mathrel}{\M@arrows}{"21BF}
1293 \DeclareMathSymbol{\upharpoonright}{\mathrel}{\M@arrows}{"21BE}
1294 \DeclareMathSymbol{\twoheaduparrow}{\mathrel}{\M@arrows}{"219F}
1295 \DeclareMathSymbol{\uparrowarrowtobar}{\mathrel}{\M@arrows}{"2912}
1296 \DeclareMathSymbol{\upwhitearrow}{\mathrel}{\M@arrows}{"21E7}
1297 \DeclareMathSymbol{\upwhitebararrow}{\mathrel}{\M@arrows}{"21EA}
1298 \DeclareMathSymbol{\upuparrows}{\mathrel}{\M@arrows}{"21C8}
1299 \DeclareMathSymbol{\downarrowarrow}{\mathrel}{\M@arrows}{"2193}
1300 \DeclareMathSymbol{\Downarrow}{\mathrel}{\M@arrows}{"21D3}
1301 \DeclareMathSymbol{\Ddownarrow}{\mathrel}{\M@arrows}{"290B}
1302 \DeclareMathSymbol{\downbararrow}{\mathrel}{\M@arrows}{"21A7}
1303 \DeclareMathSymbol{\downdasharrow}{\mathrel}{\M@arrows}{"21E3}
1304 \DeclareMathSymbol{\zigzagarrow}{\mathrel}{\M@arrows}{"21AF}
1305     \let\lightningboltarrow\zigzagarrow
1306 \DeclareMathSymbol{\downharpoonleft}{\mathrel}{\M@arrows}{"21C3}
1307 \DeclareMathSymbol{\downharpoonright}{\mathrel}{\M@arrows}{"21C2}
1308 \DeclareMathSymbol{\twoheaddownarrow}{\mathrel}{\M@arrows}{"21A1}
1309 \DeclareMathSymbol{\downarrowarrowtobar}{\mathrel}{\M@arrows}{"2913}
1310 \DeclareMathSymbol{\downwhitearrow}{\mathrel}{\M@arrows}{"21E9}
1311 \DeclareMathSymbol{\downdownarrows}{\mathrel}{\M@arrows}{"21CA}
1312 \DeclareMathSymbol{\updownarrowarrow}{\mathrel}{\M@arrows}{"2195}
1313 \DeclareMathSymbol{\Updownarrowarrow}{\mathrel}{\M@arrows}{"21D5}
1314 \DeclareMathSymbol{\updownarrows}{\mathrel}{\M@arrows}{"21C5}
1315 \DeclareMathSymbol{\downuparrows}{\mathrel}{\M@arrows}{"21F5}
1316 \DeclareMathSymbol{\updownharpoons}{\mathrel}{\M@arrows}{"296E}
1317 \DeclareMathSymbol{\downupharpoons}{\mathrel}{\M@arrows}{"296F}
1318 \DeclareMathSymbol{\nearrow}{\mathrel}{\M@arrows}{"2197}
1319 \DeclareMathSymbol{\Nearrow}{\mathrel}{\M@arrows}{"21D7}
1320 \DeclareMathSymbol{\narrow}{\mathrel}{\M@arrows}{"2196}
1321 \DeclareMathSymbol{\Narrow}{\mathrel}{\M@arrows}{"21D6}

```

```

1322 \DeclareMathSymbol{\searrow}{\mathrel}{\M@arrows}{2198}
1323 \DeclareMathSymbol{\Searrow}{\mathrel}{\M@arrows}{21D8}
1324 \DeclareMathSymbol{\swarrow}{\mathrel}{\M@arrows}{2199}
1325 \DeclareMathSymbol{\Swarrow}{\mathrel}{\M@arrows}{21D9}
1326 \DeclareMathSymbol{\nwsearrow}{\mathrel}{\M@arrows}{2921}
1327 \DeclareMathSymbol{\neswarrow}{\mathrel}{\M@arrows}{2922}
1328 \DeclareMathSymbol{\lcirclearrow}{\mathrel}{\M@arrows}{27F2}
1329 \DeclareMathSymbol{\rcirclearrow}{\mathrel}{\M@arrows}{27F3}}

```

Big operators.

```

1330 \def\bigops@set{%
1331   \edef\bigops{M\bigopsshape\the\count}
1332   \let\sum\undefined
1333   \let\prod\undefined
1334   \DeclareMathSymbol{\sum}{\mathop}{\bigops}{2211}
1335   \DeclareMathSymbol{\prod}{\mathop}{\bigops}{220F}
1336   \DeclareMathSymbol{\intop}{\mathop}{\bigops}{222B}}

```

Set extended big operators.

```

1337 \def\extbigops@set{%
1338   \edef\extbigops{M\extbigopsshape\the\count}
1339   \let\coprod\undefined
1340   \let\bigvee\undefined
1341   \let\bigwedge\undefined
1342   \let\bigcup\undefined
1343   \let\bigcap\undefined
1344   \let\bigoplus\undefined
1345   \let\bigotimes\undefined
1346   \let\bigodot\undefined
1347   \let\bigsqcup\undefined
1348   \DeclareMathSymbol{\coprod}{\mathop}{\extbigops}{2210}
1349   \DeclareMathSymbol{\bigvee}{\mathop}{\extbigops}{22C1}
1350   \DeclareMathSymbol{\bigwedge}{\mathop}{\extbigops}{22C0}
1351   \DeclareMathSymbol{\bigcup}{\mathop}{\extbigops}{22C3}
1352   \DeclareMathSymbol{\bigcap}{\mathord}{\extbigops}{22C2}
1353   \DeclareMathSymbol{\iintop}{\mathop}{\extbigops}{222C}
     \def\iint{\iintop\nolimits}
1355   \DeclareMathSymbol{\iiintop}{\mathop}{\extbigops}{222D}
     \def\iiint{\iiintop\nolimits}
1356   \DeclareMathSymbol{\ointop}{\mathop}{\extbigops}{222E}
     \def\oint{\ointop\nolimits}
1358   \DeclareMathSymbol{\oiintop}{\mathop}{\extbigops}{222F}
     \def\oiint{\oiintop\nolimits}
1360   \DeclareMathSymbol{\oiintop}{\mathop}{\extbigops}{2230}
     \def\oiint{\oiintop\nolimits}
1363   \DeclareMathSymbol{\bigoplus}{\mathop}{\extbigops}{2A01}
1364   \DeclareMathSymbol{\bigotimes}{\mathop}{\extbigops}{2A02}
1365   \DeclareMathSymbol{\bigodot}{\mathop}{\extbigops}{2A00}
1366   \DeclareMathSymbol{\bigsqcap}{\mathop}{\extbigops}{2A05}

```

```

1367 \DeclareMathSymbol{\bigsqcup}{\mathop}{\extbigops}{2A06}
Set blackboard bold letters and numbers.

1368 \def\bb@set{%
1369   \edef\bb{\M@bb\the\count}
1370   \DeclareMathSymbol{\bb@A}{\mathord}{\bb}{1D538}
1371   \DeclareMathSymbol{\bb@B}{\mathord}{\bb}{1D539}
1372   \DeclareMathSymbol{\bb@C}{\mathord}{\bb}{2102}
1373   \DeclareMathSymbol{\bb@D}{\mathord}{\bb}{1D53B}
1374   \DeclareMathSymbol{\bb@E}{\mathord}{\bb}{1D53C}
1375   \DeclareMathSymbol{\bb@F}{\mathord}{\bb}{1D53D}
1376   \DeclareMathSymbol{\bb@G}{\mathord}{\bb}{1D53E}
1377   \DeclareMathSymbol{\bb@H}{\mathord}{\bb}{210D}
1378   \DeclareMathSymbol{\bb@I}{\mathord}{\bb}{1D540}
1379   \DeclareMathSymbol{\bb@J}{\mathord}{\bb}{1D541}
1380   \DeclareMathSymbol{\bb@K}{\mathord}{\bb}{1D542}
1381   \DeclareMathSymbol{\bb@L}{\mathord}{\bb}{1D543}
1382   \DeclareMathSymbol{\bb@M}{\mathord}{\bb}{1D544}
1383   \DeclareMathSymbol{\bb@N}{\mathord}{\bb}{2115}
1384   \DeclareMathSymbol{\bb@O}{\mathord}{\bb}{1D546}
1385   \DeclareMathSymbol{\bb@P}{\mathord}{\bb}{2119}
1386   \DeclareMathSymbol{\bb@Q}{\mathord}{\bb}{211A}
1387   \DeclareMathSymbol{\bb@R}{\mathord}{\bb}{211D}
1388   \DeclareMathSymbol{\bb@S}{\mathord}{\bb}{1D54A}
1389   \DeclareMathSymbol{\bb@T}{\mathord}{\bb}{1D54B}
1390   \DeclareMathSymbol{\bb@U}{\mathord}{\bb}{1D54C}
1391   \DeclareMathSymbol{\bb@V}{\mathord}{\bb}{1D54D}
1392   \DeclareMathSymbol{\bb@W}{\mathord}{\bb}{1D54E}
1393   \DeclareMathSymbol{\bb@X}{\mathord}{\bb}{1D54F}
1394   \DeclareMathSymbol{\bb@Y}{\mathord}{\bb}{1D550}
1395   \DeclareMathSymbol{\bb@Z}{\mathord}{\bb}{2124}
1396   \DeclareMathSymbol{\bb@a}{\mathord}{\bb}{1D552}
1397   \DeclareMathSymbol{\bb@b}{\mathord}{\bb}{1D553}
1398   \DeclareMathSymbol{\bb@c}{\mathord}{\bb}{1D554}
1399   \DeclareMathSymbol{\bb@d}{\mathord}{\bb}{1D555}
1400   \DeclareMathSymbol{\bb@e}{\mathord}{\bb}{1D556}
1401   \DeclareMathSymbol{\bb@f}{\mathord}{\bb}{1D557}
1402   \DeclareMathSymbol{\bb@g}{\mathord}{\bb}{1D558}
1403   \DeclareMathSymbol{\bb@h}{\mathord}{\bb}{1D559}
1404   \DeclareMathSymbol{\bb@i}{\mathord}{\bb}{1D55A}
1405   \DeclareMathSymbol{\bb@j}{\mathord}{\bb}{1D55B}
1406   \DeclareMathSymbol{\bb@k}{\mathord}{\bb}{1D55C}
1407   \DeclareMathSymbol{\bb@l}{\mathord}{\bb}{1D55D}
1408   \DeclareMathSymbol{\bb@m}{\mathord}{\bb}{1D55E}
1409   \DeclareMathSymbol{\bb@n}{\mathord}{\bb}{1D55F}
1410   \DeclareMathSymbol{\bb@o}{\mathord}{\bb}{1D560}
1411   \DeclareMathSymbol{\bb@p}{\mathord}{\bb}{1D561}
1412   \DeclareMathSymbol{\bb@q}{\mathord}{\bb}{1D562}

```

```

1413 \DeclareMathSymbol{\M@bb@r}{\mathord}{\M@bb}{1D563}
1414 \DeclareMathSymbol{\M@bb@s}{\mathord}{\M@bb}{1D564}
1415 \DeclareMathSymbol{\M@bb@t}{\mathord}{\M@bb}{1D565}
1416 \DeclareMathSymbol{\M@bb@u}{\mathord}{\M@bb}{1D566}
1417 \DeclareMathSymbol{\M@bb@v}{\mathord}{\M@bb}{1D567}
1418 \DeclareMathSymbol{\M@bb@w}{\mathord}{\M@bb}{1D568}
1419 \DeclareMathSymbol{\M@bb@x}{\mathord}{\M@bb}{1D569}
1420 \DeclareMathSymbol{\M@bb@y}{\mathord}{\M@bb}{1D56A}
1421 \DeclareMathSymbol{\M@bb@z}{\mathord}{\M@bb}{1D56B}
1422 \expandafter\DeclareMathSymbol\expandafter
1423   {\csname M@bb@0\endcsname}{\mathord}{\M@bb}{1D7D8}
1424 \expandafter\DeclareMathSymbol\expandafter
1425   {\csname M@bb@1\endcsname}{\mathord}{\M@bb}{1D7D9}
1426 \expandafter\DeclareMathSymbol\expandafter
1427   {\csname M@bb@2\endcsname}{\mathord}{\M@bb}{1D7DA}
1428 \expandafter\DeclareMathSymbol\expandafter
1429   {\csname M@bb@3\endcsname}{\mathord}{\M@bb}{1D7DB}
1430 \expandafter\DeclareMathSymbol\expandafter
1431   {\csname M@bb@4\endcsname}{\mathord}{\M@bb}{1D7DC}
1432 \expandafter\DeclareMathSymbol\expandafter
1433   {\csname M@bb@5\endcsname}{\mathord}{\M@bb}{1D7DD}
1434 \expandafter\DeclareMathSymbol\expandafter
1435   {\csname M@bb@6\endcsname}{\mathord}{\M@bb}{1D7DE}
1436 \expandafter\DeclareMathSymbol\expandafter
1437   {\csname M@bb@7\endcsname}{\mathord}{\M@bb}{1D7DF}
1438 \expandafter\DeclareMathSymbol\expandafter
1439   {\csname M@bb@8\endcsname}{\mathord}{\M@bb}{1D7E0}
1440 \expandafter\DeclareMathSymbol\expandafter
1441   {\csname M@bb@9\endcsname}{\mathord}{\M@bb}{1D7E1}}

```

Set caligraphic letters.

```

1442 \def\M@cal@set{%
1443   \edef\@M@cal{\M@calshape\the\@M@count}
1444   \ DeclareMathSymbol{\M@cal@A}{\mathord}{\M@cal}{1D49C}
1445   \ DeclareMathSymbol{\M@cal@B}{\mathord}{\M@cal}{212C}
1446   \ DeclareMathSymbol{\M@cal@C}{\mathord}{\M@cal}{1D49E}
1447   \ DeclareMathSymbol{\M@cal@D}{\mathord}{\M@cal}{1D49F}
1448   \ DeclareMathSymbol{\M@cal@E}{\mathord}{\M@cal}{2130}
1449   \ DeclareMathSymbol{\M@cal@F}{\mathord}{\M@cal}{2131}
1450   \ DeclareMathSymbol{\M@cal@G}{\mathord}{\M@cal}{1D4A2}
1451   \ DeclareMathSymbol{\M@cal@H}{\mathord}{\M@cal}{210B}
1452   \ DeclareMathSymbol{\M@cal@I}{\mathord}{\M@cal}{2110}
1453   \ DeclareMathSymbol{\M@cal@J}{\mathord}{\M@cal}{1D4A5}
1454   \ DeclareMathSymbol{\M@cal@K}{\mathord}{\M@cal}{1D4A6}
1455   \ DeclareMathSymbol{\M@cal@L}{\mathord}{\M@cal}{2112}
1456   \ DeclareMathSymbol{\M@cal@M}{\mathord}{\M@cal}{2133}
1457   \ DeclareMathSymbol{\M@cal@N}{\mathord}{\M@cal}{1D4A9}
1458   \ DeclareMathSymbol{\M@cal@O}{\mathord}{\M@cal}{1D4AA}

```

```

1459 \DeclareMathSymbol{\M@cal@P}{\mathord}{\M@cal}{1D4AB}
1460 \DeclareMathSymbol{\M@cal@Q}{\mathord}{\M@cal}{1D4AC}
1461 \DeclareMathSymbol{\M@cal@R}{\mathord}{\M@cal}{211B}
1462 \DeclareMathSymbol{\M@cal@S}{\mathord}{\M@cal}{1D4AE}
1463 \DeclareMathSymbol{\M@cal@T}{\mathord}{\M@cal}{1D4AF}
1464 \DeclareMathSymbol{\M@cal@U}{\mathord}{\M@cal}{1D4B0}
1465 \DeclareMathSymbol{\M@cal@V}{\mathord}{\M@cal}{1D4B1}
1466 \DeclareMathSymbol{\M@cal@W}{\mathord}{\M@cal}{1D4B2}
1467 \DeclareMathSymbol{\M@cal@X}{\mathord}{\M@cal}{1D4B3}
1468 \DeclareMathSymbol{\M@cal@Y}{\mathord}{\M@cal}{1D4B4}
1469 \DeclareMathSymbol{\M@cal@Z}{\mathord}{\M@cal}{1D4B5}
1470 \DeclareMathSymbol{\M@cal@a}{\mathord}{\M@cal}{1D4B6}
1471 \DeclareMathSymbol{\M@cal@b}{\mathord}{\M@cal}{1D4B7}
1472 \DeclareMathSymbol{\M@cal@c}{\mathord}{\M@cal}{1D4B8}
1473 \DeclareMathSymbol{\M@cal@d}{\mathord}{\M@cal}{1D4B9}
1474 \DeclareMathSymbol{\M@cal@e}{\mathord}{\M@cal}{212F}
1475 \DeclareMathSymbol{\M@cal@f}{\mathord}{\M@cal}{1D4BB}
1476 \DeclareMathSymbol{\M@cal@g}{\mathord}{\M@cal}{210A}
1477 \DeclareMathSymbol{\M@cal@h}{\mathord}{\M@cal}{1D4BD}
1478 \DeclareMathSymbol{\M@cal@i}{\mathord}{\M@cal}{1D4BE}
1479 \DeclareMathSymbol{\M@cal@j}{\mathord}{\M@cal}{1D4BF}
1480 \DeclareMathSymbol{\M@cal@k}{\mathord}{\M@cal}{1D4C0}
1481 \DeclareMathSymbol{\M@cal@l}{\mathord}{\M@cal}{1D4C1}
1482 \DeclareMathSymbol{\M@cal@m}{\mathord}{\M@cal}{1D4C2}
1483 \DeclareMathSymbol{\M@cal@n}{\mathord}{\M@cal}{1D4C3}
1484 \DeclareMathSymbol{\M@cal@o}{\mathord}{\M@cal}{2134}
1485 \DeclareMathSymbol{\M@cal@p}{\mathord}{\M@cal}{1D4C5}
1486 \DeclareMathSymbol{\M@cal@q}{\mathord}{\M@cal}{1D4C6}
1487 \DeclareMathSymbol{\M@cal@r}{\mathord}{\M@cal}{1D4C7}
1488 \DeclareMathSymbol{\M@cal@s}{\mathord}{\M@cal}{1D4C8}
1489 \DeclareMathSymbol{\M@cal@t}{\mathord}{\M@cal}{1D4C9}
1490 \DeclareMathSymbol{\M@cal@u}{\mathord}{\M@cal}{1D4CA}
1491 \DeclareMathSymbol{\M@cal@v}{\mathord}{\M@cal}{1D4CB}
1492 \DeclareMathSymbol{\M@cal@w}{\mathord}{\M@cal}{1D4CC}
1493 \DeclareMathSymbol{\M@cal@x}{\mathord}{\M@cal}{1D4CD}
1494 \DeclareMathSymbol{\M@cal@y}{\mathord}{\M@cal}{1D4CE}
1495 \DeclareMathSymbol{\M@cal@z}{\mathord}{\M@cal}{1D4CF}}

```

Set fraktur letters.

```

1496 \def\M@frak@set{%
1497   \edef\M@frak{\M@frakshape\the\M@count}
1498   \ DeclareMathSymbol{\M@frak@A}{\mathord}{\M@frak}{1D504}
1499   \ DeclareMathSymbol{\M@frak@B}{\mathord}{\M@frak}{1D505}
1500   \ DeclareMathSymbol{\M@frak@C}{\mathord}{\M@frak}{212D}
1501   \ DeclareMathSymbol{\M@frak@D}{\mathord}{\M@frak}{1D507}
1502   \ DeclareMathSymbol{\M@frak@E}{\mathord}{\M@frak}{1D508}
1503   \ DeclareMathSymbol{\M@frak@F}{\mathord}{\M@frak}{1D509}
1504   \ DeclareMathSymbol{\M@frak@G}{\mathord}{\M@frak}{1D50A}

```

```

1505 \DeclareMathSymbol{\M@frak@H}{\mathord}{\M@frak}{210C}
1506 \DeclareMathSymbol{\M@frak@I}{\mathord}{\M@frak}{2111}
1507 \DeclareMathSymbol{\M@frak@J}{\mathord}{\M@frak}{1D50D}
1508 \DeclareMathSymbol{\M@frak@K}{\mathord}{\M@frak}{1D50E}
1509 \DeclareMathSymbol{\M@frak@L}{\mathord}{\M@frak}{1D50F}
1510 \DeclareMathSymbol{\M@frak@M}{\mathord}{\M@frak}{1D510}
1511 \DeclareMathSymbol{\M@frak@N}{\mathord}{\M@frak}{1D511}
1512 \DeclareMathSymbol{\M@frak@O}{\mathord}{\M@frak}{1D512}
1513 \DeclareMathSymbol{\M@frak@P}{\mathord}{\M@frak}{1D513}
1514 \DeclareMathSymbol{\M@frak@Q}{\mathord}{\M@frak}{1D514}
1515 \DeclareMathSymbol{\M@frak@R}{\mathord}{\M@frak}{212C}
1516 \DeclareMathSymbol{\M@frak@S}{\mathord}{\M@frak}{1D516}
1517 \DeclareMathSymbol{\M@frak@T}{\mathord}{\M@frak}{1D517}
1518 \DeclareMathSymbol{\M@frak@U}{\mathord}{\M@frak}{1D518}
1519 \DeclareMathSymbol{\M@frak@V}{\mathord}{\M@frak}{1D519}
1520 \DeclareMathSymbol{\M@frak@W}{\mathord}{\M@frak}{1D51A}
1521 \DeclareMathSymbol{\M@frak@X}{\mathord}{\M@frak}{1D51B}
1522 \DeclareMathSymbol{\M@frak@Y}{\mathord}{\M@frak}{1D51C}
1523 \DeclareMathSymbol{\M@frak@Z}{\mathord}{\M@frak}{2128}
1524 \DeclareMathSymbol{\M@frak@a}{\mathord}{\M@frak}{1D51E}
1525 \DeclareMathSymbol{\M@frak@b}{\mathord}{\M@frak}{1D51F}
1526 \DeclareMathSymbol{\M@frak@c}{\mathord}{\M@frak}{1D520}
1527 \DeclareMathSymbol{\M@frak@d}{\mathord}{\M@frak}{1D521}
1528 \DeclareMathSymbol{\M@frak@e}{\mathord}{\M@frak}{1D522}
1529 \DeclareMathSymbol{\M@frak@f}{\mathord}{\M@frak}{1D523}
1530 \DeclareMathSymbol{\M@frak@g}{\mathord}{\M@frak}{1D524}
1531 \DeclareMathSymbol{\M@frak@h}{\mathord}{\M@frak}{1D525}
1532 \DeclareMathSymbol{\M@frak@i}{\mathord}{\M@frak}{1D526}
1533 \DeclareMathSymbol{\M@frak@j}{\mathord}{\M@frak}{1D527}
1534 \DeclareMathSymbol{\M@frak@k}{\mathord}{\M@frak}{1D528}
1535 \DeclareMathSymbol{\M@frak@l}{\mathord}{\M@frak}{1D529}
1536 \DeclareMathSymbol{\M@frak@m}{\mathord}{\M@frak}{1D52A}
1537 \DeclareMathSymbol{\M@frak@n}{\mathord}{\M@frak}{1D52B}
1538 \DeclareMathSymbol{\M@frak@o}{\mathord}{\M@frak}{1D52C}
1539 \DeclareMathSymbol{\M@frak@p}{\mathord}{\M@frak}{1D52D}
1540 \DeclareMathSymbol{\M@frak@q}{\mathord}{\M@frak}{1D52E}
1541 \DeclareMathSymbol{\M@frak@r}{\mathord}{\M@frak}{1D52F}
1542 \DeclareMathSymbol{\M@frak@s}{\mathord}{\M@frak}{1D530}
1543 \DeclareMathSymbol{\M@frak@t}{\mathord}{\M@frak}{1D531}
1544 \DeclareMathSymbol{\M@frak@u}{\mathord}{\M@frak}{1D532}
1545 \DeclareMathSymbol{\M@frak@v}{\mathord}{\M@frak}{1D533}
1546 \DeclareMathSymbol{\M@frak@w}{\mathord}{\M@frak}{1D534}
1547 \DeclareMathSymbol{\M@frak@x}{\mathord}{\M@frak}{1D535}
1548 \DeclareMathSymbol{\M@frak@y}{\mathord}{\M@frak}{1D536}
1549 \DeclareMathSymbol{\M@frak@z}{\mathord}{\M@frak}{1D537}

```

Set bold caligraphic letters.

```
1550 \def\MCAL@set{%
```

```
1551 \edef\MC@bcal{\M@bcalshape\the\M@count}
1552 \DeclareMathSymbol{\MC@bcal@A}{\mathord}{\MC@bcal}{1D4D0}
1553 \DeclareMathSymbol{\MC@bcal@B}{\mathord}{\MC@bcal}{1D4D1}
1554 \DeclareMathSymbol{\MC@bcal@C}{\mathord}{\MC@bcal}{1D4D2}
1555 \DeclareMathSymbol{\MC@bcal@D}{\mathord}{\MC@bcal}{1D4D3}
1556 \DeclareMathSymbol{\MC@bcal@E}{\mathord}{\MC@bcal}{1D4D4}
1557 \DeclareMathSymbol{\MC@bcal@F}{\mathord}{\MC@bcal}{1D4D5}
1558 \DeclareMathSymbol{\MC@bcal@G}{\mathord}{\MC@bcal}{1D4D6}
1559 \DeclareMathSymbol{\MC@bcal@H}{\mathord}{\MC@bcal}{1D4D7}
1560 \DeclareMathSymbol{\MC@bcal@I}{\mathord}{\MC@bcal}{1D4D8}
1561 \DeclareMathSymbol{\MC@bcal@J}{\mathord}{\MC@bcal}{1D4D9}
1562 \DeclareMathSymbol{\MC@bcal@K}{\mathord}{\MC@bcal}{1D4DA}
1563 \DeclareMathSymbol{\MC@bcal@L}{\mathord}{\MC@bcal}{1D4DB}
1564 \DeclareMathSymbol{\MC@bcal@M}{\mathord}{\MC@bcal}{1D4DC}
1565 \DeclareMathSymbol{\MC@bcal@N}{\mathord}{\MC@bcal}{1D4DD}
1566 \DeclareMathSymbol{\MC@bcal@O}{\mathord}{\MC@bcal}{1D4DE}
1567 \DeclareMathSymbol{\MC@bcal@P}{\mathord}{\MC@bcal}{1D4DF}
1568 \DeclareMathSymbol{\MC@bcal@Q}{\mathord}{\MC@bcal}{1D4E0}
1569 \DeclareMathSymbol{\MC@bcal@R}{\mathord}{\MC@bcal}{1D4E1}
1570 \DeclareMathSymbol{\MC@bcal@S}{\mathord}{\MC@bcal}{1D4E2}
1571 \DeclareMathSymbol{\MC@bcal@T}{\mathord}{\MC@bcal}{1D4E3}
1572 \DeclareMathSymbol{\MC@bcal@U}{\mathord}{\MC@bcal}{1D4E4}
1573 \DeclareMathSymbol{\MC@bcal@V}{\mathord}{\MC@bcal}{1D4E5}
1574 \DeclareMathSymbol{\MC@bcal@W}{\mathord}{\MC@bcal}{1D4E6}
1575 \DeclareMathSymbol{\MC@bcal@X}{\mathord}{\MC@bcal}{1D4E7}
1576 \DeclareMathSymbol{\MC@bcal@Y}{\mathord}{\MC@bcal}{1D4E8}
1577 \DeclareMathSymbol{\MC@bcal@Z}{\mathord}{\MC@bcal}{1D4E9}
1578 \DeclareMathSymbol{\MC@bcal@a}{\mathord}{\MC@bcal}{1D4EA}
1579 \DeclareMathSymbol{\MC@bcal@b}{\mathord}{\MC@bcal}{1D4EB}
1580 \DeclareMathSymbol{\MC@bcal@c}{\mathord}{\MC@bcal}{1D4EC}
1581 \DeclareMathSymbol{\MC@bcal@d}{\mathord}{\MC@bcal}{1D4ED}
1582 \DeclareMathSymbol{\MC@bcal@e}{\mathord}{\MC@bcal}{1D4EE}
1583 \DeclareMathSymbol{\MC@bcal@f}{\mathord}{\MC@bcal}{1D4EF}
1584 \DeclareMathSymbol{\MC@bcal@g}{\mathord}{\MC@bcal}{1D4FO}
1585 \DeclareMathSymbol{\MC@bcal@h}{\mathord}{\MC@bcal}{1D4F1}
1586 \DeclareMathSymbol{\MC@bcal@i}{\mathord}{\MC@bcal}{1D4F2}
1587 \DeclareMathSymbol{\MC@bcal@j}{\mathord}{\MC@bcal}{1D4F3}
1588 \DeclareMathSymbol{\MC@bcal@k}{\mathord}{\MC@bcal}{1D4F4}
1589 \DeclareMathSymbol{\MC@bcal@l}{\mathord}{\MC@bcal}{1D4F5}
1590 \DeclareMathSymbol{\MC@bcal@m}{\mathord}{\MC@bcal}{1D4F6}
1591 \DeclareMathSymbol{\MC@bcal@n}{\mathord}{\MC@bcal}{1D4F7}
1592 \DeclareMathSymbol{\MC@bcal@o}{\mathord}{\MC@bcal}{1D4F8}
1593 \DeclareMathSymbol{\MC@bcal@p}{\mathord}{\MC@bcal}{1D4F9}
1594 \DeclareMathSymbol{\MC@bcal@q}{\mathord}{\MC@bcal}{1D4FA}
1595 \DeclareMathSymbol{\MC@bcal@r}{\mathord}{\MC@bcal}{1D4FB}
1596 \DeclareMathSymbol{\MC@bcal@s}{\mathord}{\MC@bcal}{1D4FC}
1597 \DeclareMathSymbol{\MC@bcal@t}{\mathord}{\MC@bcal}{1D4FD}
```

```

1598 \DeclareMathSymbol{\M@bcal@u}{\mathord}{\M@bcal}{1D4FE}
1599 \DeclareMathSymbol{\M@bcal@v}{\mathord}{\M@bcal}{1D4FF}
1600 \DeclareMathSymbol{\M@bcal@w}{\mathord}{\M@bcal}{1D500}
1601 \DeclareMathSymbol{\M@bcal@x}{\mathord}{\M@bcal}{1D501}
1602 \DeclareMathSymbol{\M@bcal@y}{\mathord}{\M@bcal}{1D502}
1603 \DeclareMathSymbol{\M@bcal@z}{\mathord}{\M@bcal}{1D503}

```

Set bold fraktur letters.

```

1604 \def\M@bfrak@set{%
1605   \edef\M@bfrak{M\@bfrakshape\the\M@count}
1606   \DeclareMathSymbol{\M@bfrak@A}{\mathord}{\M@bfrak}{1D56C}
1607   \DeclareMathSymbol{\M@bfrak@B}{\mathord}{\M@bfrak}{1D56D}
1608   \DeclareMathSymbol{\M@bfrak@C}{\mathord}{\M@bfrak}{1D56E}
1609   \DeclareMathSymbol{\M@bfrak@D}{\mathord}{\M@bfrak}{1D56F}
1610   \DeclareMathSymbol{\M@bfrak@E}{\mathord}{\M@bfrak}{1D570}
1611   \DeclareMathSymbol{\M@bfrak@F}{\mathord}{\M@bfrak}{1D571}
1612   \DeclareMathSymbol{\M@bfrak@G}{\mathord}{\M@bfrak}{1D572}
1613   \DeclareMathSymbol{\M@bfrak@H}{\mathord}{\M@bfrak}{1D573}
1614   \DeclareMathSymbol{\M@bfrak@I}{\mathord}{\M@bfrak}{1D574}
1615   \DeclareMathSymbol{\M@bfrak@J}{\mathord}{\M@bfrak}{1D575}
1616   \DeclareMathSymbol{\M@bfrak@K}{\mathord}{\M@bfrak}{1D576}
1617   \DeclareMathSymbol{\M@bfrak@L}{\mathord}{\M@bfrak}{1D577}
1618   \DeclareMathSymbol{\M@bfrak@M}{\mathord}{\M@bfrak}{1D578}
1619   \DeclareMathSymbol{\M@bfrak@N}{\mathord}{\M@bfrak}{1D579}
1620   \DeclareMathSymbol{\M@bfrak@O}{\mathord}{\M@bfrak}{1D57A}
1621   \DeclareMathSymbol{\M@bfrak@P}{\mathord}{\M@bfrak}{1D57B}
1622   \DeclareMathSymbol{\M@bfrak@Q}{\mathord}{\M@bfrak}{1D57C}
1623   \DeclareMathSymbol{\M@bfrak@R}{\mathord}{\M@bfrak}{1D57D}
1624   \DeclareMathSymbol{\M@bfrak@S}{\mathord}{\M@bfrak}{1D57E}
1625   \DeclareMathSymbol{\M@bfrak@T}{\mathord}{\M@bfrak}{1D57F}
1626   \DeclareMathSymbol{\M@bfrak@U}{\mathord}{\M@bfrak}{1D580}
1627   \DeclareMathSymbol{\M@bfrak@V}{\mathord}{\M@bfrak}{1D581}
1628   \DeclareMathSymbol{\M@bfrak@W}{\mathord}{\M@bfrak}{1D582}
1629   \DeclareMathSymbol{\M@bfrak@X}{\mathord}{\M@bfrak}{1D583}
1630   \DeclareMathSymbol{\M@bfrak@Y}{\mathord}{\M@bfrak}{1D584}
1631   \DeclareMathSymbol{\M@bfrak@Z}{\mathord}{\M@bfrak}{1D585}
1632   \DeclareMathSymbol{\M@bfrak@a}{\mathord}{\M@bfrak}{1D586}
1633   \DeclareMathSymbol{\M@bfrak@b}{\mathord}{\M@bfrak}{1D587}
1634   \DeclareMathSymbol{\M@bfrak@c}{\mathord}{\M@bfrak}{1D588}
1635   \DeclareMathSymbol{\M@bfrak@d}{\mathord}{\M@bfrak}{1D589}
1636   \DeclareMathSymbol{\M@bfrak@e}{\mathord}{\M@bfrak}{1D58A}
1637   \DeclareMathSymbol{\M@bfrak@f}{\mathord}{\M@bfrak}{1D58B}
1638   \DeclareMathSymbol{\M@bfrak@g}{\mathord}{\M@bfrak}{1D58C}
1639   \DeclareMathSymbol{\M@bfrak@h}{\mathord}{\M@bfrak}{1D58D}
1640   \DeclareMathSymbol{\M@bfrak@i}{\mathord}{\M@bfrak}{1D58E}
1641   \DeclareMathSymbol{\M@bfrak@j}{\mathord}{\M@bfrak}{1D58F}
1642   \DeclareMathSymbol{\M@bfrak@k}{\mathord}{\M@bfrak}{1D590}
1643   \DeclareMathSymbol{\M@bfrak@l}{\mathord}{\M@bfrak}{1D591}

```

```
1644 \DeclareMathSymbol{\M@bfrak@m}{\mathord}{\M@bfrak}{1D592}
1645 \DeclareMathSymbol{\M@bfrak@n}{\mathord}{\M@bfrak}{1D593}
1646 \DeclareMathSymbol{\M@bfrak@o}{\mathord}{\M@bfrak}{1D594}
1647 \DeclareMathSymbol{\M@bfrak@p}{\mathord}{\M@bfrak}{1D595}
1648 \DeclareMathSymbol{\M@bfrak@q}{\mathord}{\M@bfrak}{1D596}
1649 \DeclareMathSymbol{\M@bfrak@r}{\mathord}{\M@bfrak}{1D597}
1650 \DeclareMathSymbol{\M@bfrak@s}{\mathord}{\M@bfrak}{1D598}
1651 \DeclareMathSymbol{\M@bfrak@t}{\mathord}{\M@bfrak}{1D599}
1652 \DeclareMathSymbol{\M@bfrak@u}{\mathord}{\M@bfrak}{1D59A}
1653 \DeclareMathSymbol{\M@bfrak@v}{\mathord}{\M@bfrak}{1D59B}
1654 \DeclareMathSymbol{\M@bfrak@w}{\mathord}{\M@bfrak}{1D59C}
1655 \DeclareMathSymbol{\M@bfrak@x}{\mathord}{\M@bfrak}{1D59D}
1656 \DeclareMathSymbol{\M@bfrak@y}{\mathord}{\M@bfrak}{1D59E}
1657 \DeclareMathSymbol{\M@bfrak@z}{\mathord}{\M@bfrak}{1D59F}}
```

Version History

- 1.1b** July 2018
 –initial release
- 1.2** August 2018
 –minor bug fix for `\mathfrak`
 –eliminated redundant batchfile
- 1.3** January 2019
 –added `symbols` keyword
 –created `mathfont_example.pdf`
 –corrected the description of the `mathastext` package
 –font-change `\message` added to `\mathfont`
- 1.4** April 2019
 –`\setfont` command added
 –`\mathfont` optional argument can parse spaces
 –`no-operators` now default package optional argument
 –added `\comma` command
 –new fancy fatal error message
 –improved messaging for `\mathfont`
 –internal command `\mathpound` changed to `\mathhash`
 –added a missing #1 after `\char`\"` in the example code redefining " in the user guide
- 1.5** April 2019
 –separated `\increment` and `\Delta`
 –version history added
 –initial off-the-shelf use insert added
- 1.6** November 2019
 –separated implementation and user documentation
 –created `mathfont_heading.tex`
 –created `mathfont_doc_patch.tex` for use with the index
 –changed `mathfont_greek.pdf` to `mathfont_symbol_list.pdf`
 –eliminated `mathfont_example.pdf`

- eliminated `operators` package option
- eliminated `packages` package option
- font name can be package option
- added Hebrew and Cyrillic characters
- separated ancient Greek from modern Greek characters
- created new keywords: `extsymbols`, `delimiters`, `arrows`, `diacritics`, `bigops`, `extbigops`
- improved messaging
- improved internal code for local font-change commands
- improved space parsing for the optional argument of `\mathfont`
- bug fix for `\#`, etc. commands
- bad input for `\mathbb`, etc. now gives a warning
- improved error checking for `\newmathrm`, etc. commands
- `\mathfont` now ignores bad options (on top of issuing an error)
- internal commands now begin with `\M@...`
- added Easter egg
- improved indexing
- `mathfont.dtx` renamed as `mathfont_code.dtx`
- `\newmathbold` renamed as `\newmathbf`
- default local font changes now use `\updefault`, etc.
- added fatal error for missing `fontspec`
- fatal errors result in `\endinput` rather than `\@@end`

Index

Entries in italics refer to pages in this document, and non-italic entries refer to lines in the code. **Bold** indicates a definition.

Symbols	
\#	1004
\\$	235
\%	1005
\&	1006
\@set@mathaccent	252, 589
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