

Package **mathfont** v. 1.1b Documentation

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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 alphanumeric symbols. Crucially, **mathfont** is compatible with both **Lua \TeX** and **X \LaTeX** , and it provides several font-loading commands that allow the user to change fonts locally or for individual symbols within math mode.

Handling fonts in \TeX and \LaTeX is a notoriously difficult task. The \TeX engine originally supported only fonts designed with Donald Knuth’s Metafont, and while subsequent versions of \TeX extended this functionality to postscript fonts, Plain \TeX ’s font-loading capabilities remain limited. Many, if not most, \LaTeX users are unfamiliar with the `.fd` files that must be used in font declaration, and the minutiae of \TeX ’s `\font` primitive can be esoteric and confusing. \LaTeX 2 ϵ ’s New Font Selection System (NFSS) implemented a straightforward syntax for loading and managing fonts, but \LaTeX macros overlaying a \TeX core face the same versatility issues as Plain \TeX itself. Fonts in math mode present a double challenge: even if the user successfully loads a font either in Plain \TeX or through the NFSS, defining math symbols can be unintuitive for users who are unfamiliar with \TeX ’s `\mathcode` primitive. Again, \LaTeX 2 ϵ simplifies much of the coding challenges with its `\DeclareMathSymbol` macro, but the fundamental aspects of the task remain the same.

More recent engines such as Jonathan Kew’s **X \LaTeX** and Hans Hagen, et al.’s **Lua \TeX** significantly extend the font-loading capabilities of \TeX . Both support TrueType and OpenType font formats and provide many additional primitives for managing fonts. The **fontspec** package by Will Robertson and Khaled Hosny acts as a front-end for the font management built into these two engines. It allows users to easily load new fonts and transition between those ones already in memory, and users who are interested in changing text fonts should consult the documentation for that package. Notably, **fontspec** provides users with the tools to manually adjust OpenType features of the fonts they load, so the package gives equivalent or in some cases superior font management capabilities to a modern WYSIWYG word processor. (Of course, the efficiency depends on the skill of the \LaTeX user.) In situations where a font’s OpenType features are unclear or difficult to access, **fontspec**’s typographical advantages can significantly outweigh the accessibility of a word processor.

Basic Functionality

The **mathfont** package uses **fontspec** as a back end to load fonts for use in math mode, and it provides two ways to do this: (1) changing the default font for certain classes of math mode characters; and (2) defining new commands that change the font locally for the so-called “math alphabet” characters. (The math alphabet characters are all Latin letters, all

Arabic numerals, and any Greek letters that **mathfont** has set the font for.) The package can change the math font for Latin and Greek letters, Arabic numerals, and unicode alphanumeric symbols to any unicode OpenType or TrueType font. Tables 1 and 2 display the individual classes of characters that **mathfont**'s default font-change command acts on, and currently, **mathfont** does not support font changes for any mathematical symbols beyond those in both tables, although it does provide control sequences to typeset several ancient Greek characters that are typically unavailable.

The package can be loaded with the standard `\usepackage` syntax. The only valid option for **mathfont** is “`packages`,” and this option determines when **mathfont** resets two \LaTeX internal commands used in declaring math characters. During loading, **mathfont** redefines two \LaTeX internal macros so that \LaTeX can declare math symbols from unicode fonts. The `\mathfont` command works only with these redefinitions, and the package will issue an error if the user calls the command without them. If the user loads the package without the `packages` option, **mathfont** will reset these two \LaTeX kernel macros just before the user loads another package, and at that point, the user will not be able to call the `\mathfont` control sequence any more. The advantage of this behavior is that it makes **mathfont** less likely to disturb the functionality of other packages, particularly those that define any math symbols. With `packages`, **mathfont** does not reset the kernel automatically, so users can call `\mathfont` any time in the document preamble. The command `\restoremathinternals` manually restores the kernel, and users who load **mathfont** without `packages` should use this command to avoid clashes with other packages. In any event, it is best practice to include all `\mathfont` commands immediately after loading the package.

The functionality of **mathfont** is most closely related to that of the **mathspec** package by Andrew Gilbert Moschou. These two packages incorporate the use of individual unicode characters into math mode, and their symbol declaration process is similar. Both use **fontspec** as a back end. Both create font-changing commands for math mode characters. However, the functionality differs in two crucial respects: **mathfont** is compatible with $\text{Lua}\LaTeX$, and its local math-font-changing mechanisms provide a slightly greater level of flexibility than what users can achieve with **mathspec**. Further, as far as I am aware, this package is the first to provide robust support for the unicode alphanumeric symbols listed in Table 2, even in the context of fonts without built-in math support. (Please let me know if this is incorrect!) In this way **mathfont**, like **mathspec**, is significantly more versatile than the **unicode-math** package, although its impact is less far-reaching. Unlike the **mathastext** package, **mathfont** preserves \TeX 's traditional mathematics spacing.

The package loads **fontspec** with the “`no-math`” option if and only if the user has not already loaded **fontspec**. Users who want **fontspec** without `no-math` or with other options in place should manually load it before requiring **mathfont**. It is strongly recommended that users who manually load **fontspec** do so with the `no-math` option. Alternatively, users who want to pass options to **fontspec** without having to load it themselves can use \LaTeX 's `\PassOptionsToPackage` command.

Compatibility with $\text{Lua}\LaTeX$ comes at the expense of **mathspec**'s convenient space-adjustment character “`~`”, so spacing-conscientious users should either manually add `\kern` or `\muskip` to their equations or redefine an active version of “`~`”. For example, the code

```
\catcode'\~=\active
```

```

\def"#1{\ifmmode
  \kern<dimension> #1\kern<other dimension>
\else
  \char'\%"
\fi}

```

will serve as a hack that very roughly approximates `mathspec`'s `"`. This code will redefine `"` to typeset a right double quotation mark in horizontal mode, but in math mode, the character will insert *dimension* and *other dimension* of white space on either side respectively of the following character. More advanced users can automate the dimensions by using `TeX`'s `\if` conditional to test whether the following character needs a particular spacing adjustment. (For example, Computer Modern's math-mode *f* is notorious for being significantly wider than its italic counterpart.) Future versions of `mathfont` may provide an automated space-adjustment command, but it is not a priority.

Setting the Default Font

The `\mathfont` command sets the default font for certain classes of characters, and it can be called any number of times in the document preamble. Its structure is

```

\mathfont[<optional character classes>]{<font name>},

```

where the *optional character classes* can be any set of keywords from Table 1 or Table 2, and the *font name* can be any OpenType or TrueType font in a directory searchable by `TeX`. Specifically, `fontspec` must be able to recognize and load the font specified in the mandatory argument of `\mathfont`. Advanced users will note that `\mathfont` uses the `\fontspec_set_family:Nnn` command and therefore loads fonts in the same way as all the `\fontspec` and related macros from that package. Currently, `mathfont` does not support the use of OpenType features in math mode.

The user should specify any keyword optional arguments for `\mathfont` as entries in a comma-separated list. The order is irrelevant, and for each item in the list, the package will change the math font for that class of characters to the font specified in the mandatory argument. If the user does not specify an optional argument for `\mathfont`, the macro will insert all keywords from Table 1 as the optional argument. By default, `mathfont` will use either an upright or italic shape corresponding to each character-class keyword, but the user can override this setting by writing an equals sign next to the keyword and a shape suboption—either `roman` or `italic`—following that. Table 1 contains the default shapes for the keywords listed there, while the default shape for all classes of characters in Table 2 is upright. The package interprets the `roman` suboption as specifying an upright shape—normal shape in the language of the NFSS—and the `italic` suboption as specifying an italic shape. Currently `mathfont` does not support default font shapes beyond these two. For example, the command

```

\mathfont[upper=roman,lower=roman]{Times New Roman}

```

would change all math-mode Latin letters to Times New Roman with upright shape. The optional argument for `\mathfont` should not contain any spaces because `mathfont` will not

Table 1: Math Alphabet Characters

Keyword	Meaning	Default shape
<code>upper</code>	Capital Latin letters	Italic
<code>lower</code>	Minuscule Latin letters	Italic
<code>greekupper</code>	Capital Greek letters	Upright
<code>greeklower</code>	Minuscule Greek letters	Italic
<code>digits</code>	Arabic numerals	Upright
<code>operator</code>	Operator font	Upright

be able to parse the text correctly, and if the user mistakenly includes a space after a comma or around an equals sign, the package will issue an “Invalid option” error. Future versions of `mathfont` may address this limitation, but it is not a priority. Users should be aware that, in order to limit the number of symbol fonts in memory, `\mathfont` will not change the default font for a class of symbols once it has already done so.

The Unicode Consortium designates the Mathematical Alphanumeric Symbols (U+1D400–U+1D7FF) code block for several classes of letters and letterlike symbols that appear frequently in math writing. The `mathfont` package provides easy access to these symbols through the `\mathfont` command, and Table 2 lists the corresponding keywords that should be used with `\mathfont` to do so. When the user calls `\mathfont` with a keyword from Table 2 in its optional argument, `mathfont` both declares the appropriate unicode characters as math symbols and defines the macro

`\math<keyword>{\<argument>}`.

The control sequence takes one argument, and it converts the characters in its argument into the corresponding style. For example,

`\mathfont[bcal]{STIXGeneral}`

will set `STIXGeneral` as the font for bold caligraphic characters and define the command `\mathbcal` to access them in math mode. The argument of the macro produced this way must be a single string of Latin letters without braces or control sequences, although in somewhat idiosyncratic fashion, the `\mathbb` command can also accept Arabic numerals in its argument. Spaces and any character of catcode 12 will be ignored.

Table 2: Alphanumeric Symbols

Keyword	Meaning
<code>bb</code>	Blackboard Bold (Double-struck)
<code>cal</code>	Caligraphic
<code>frak</code>	Fraktur
<code>bcal</code>	Bold Caligraphic
<code>bfrak</code>	Bold Fraktur

Because these commands can handle capital and minuscule Latin letters, the `mathfont` package significantly extends the functionality of \TeX ’s standard `\mathcal` command and the

`\mathbb` command from the `amssymb` package. Users should note that typesetting symbols from a class of characters in Table 2 will require a unicode font that actually contains those characters, such as Symbola or STIXGeneral. That being said, users who need only a few alphanumeric symbols may be able to use a less specialized font that contains for example the characters from the Letterlike Symbols (U+2100–U+214F) code block. This block contains the blackboard bold versions of C, N, Q, R, and Z, and the fonts providing these characters are significantly more common than those that contain the full blackboard bold alphabet.

Local Font Changes

With `mathfont`, users can locally change the font in math mode by creating a new control sequence for each new font desired. The commands created this way function analogously to the standard math font macros from the L^AT_EX kernel such as `\mathrm`, `\mathit`, and `\mathnormal`. The package includes four basic commands to produce these new control sequences. Table 3 lays them out, and they all have the same argument structure. As an example, the macro `\newmathrm` looks like

```
\newmathrm{<control sequence>}{<font name>}
```

It defines the *control sequence* in its first argument to accept a string of characters that it then converts to the *font name* in the second argument with upright shape and medium weight. Writing

```
\newmathrm{\matharial}{Arial}
```

would create the macro

```
\matharial{<argument>},
```

which can be used only in math mode and which converts the math alphabet characters in its *argument* into the Arial font with upright shape and medium weight. The other three commands in Table 3 function in the same way except that they select different series or shape values for the font in question, and Table 3 lists this information. If the user specifies the font for Greek letters using `\mathfont`, the macros created with the commands from Table 3 will affect those characters; otherwise, they will not. L^AT_EX 2_ε does not define Greek letters as math alphabet characters, and this switch to being math alphabet characters occurs only during a font change due to `\mathfont`. More specifically, `mathfont` defines Greek characters as `\mathalpha` type when it declares them as symbols. If the user doesn't change the `greekupper` or `greeklower` characters in a `\mathfont` command, the package won't change any Greek characters, and they will still be typeset as `\mathord` characters in Computer Modern (or potentially Latin Modern). In such a situation, any `\newmathfontcommand` or related macro will not be able to adjust Greek characters' font.

Together these four commands will provide users with the tools for almost all desired local font changes, but they inevitably will be insufficient for some particular case. Accordingly, `mathfont` provides the more general `\newmathfontcommand` macro that functions similarly to the commands from Table 3 but allows the user to specify certain font characteristics. Its argument structure is

```
\newmathfontcommand{<control sequence>}{<font name>}{<series>}{<shape>},
```

Table 3: Font-changing Commands

Command	Font Characteristics
<code>\newmathrm</code>	Upright shape; medium weight
<code>\newmathit</code>	Italic shape; medium weight
<code>\newmathbold</code>	Upright shape; bold weight
<code>\newmathboldit</code>	Italic shape; bold weight

where the font name again means any OpenType or TrueType font in a directory searchable by \TeX . The series and shape information refers to the NFSS codes for these attributes, and the control sequence in the first argument becomes the command that allows the user to access the specified font. Advanced users will note that these five macros are essentially wrapped versions of \LaTeX ’s `\DeclareMathAlphabet`, so like `\mathfont`, they must be used in the document preamble.

Greek Characters

Unlike Plain \TeX and $\text{\LaTeX} 2_{\epsilon}$, `mathfont` defines control sequences for all characters in the Greek alphabet. (\TeX ’s OT encodings do not include the capital Greek characters that resemble Latin letters. Presumably Donald Knuth made this decision to conserve encoding slots.) All such control sequences instruct \LaTeX to typeset the corresponding unicode Greek character, and `mathfont` also provides control sequences for several ancient Greek letters. Table 4 lists all Greek character control sequences provided by `mathfont`. I do not include typeset versions of these characters in this documentation because I wanted to avoid potential problems with users being unable to compile `mathfont.dtx` properly. However, see the file `mathfont_greek.pdf`, which is included with the `mathfont` installation and is available on CTAN.

Handling Errors

Most of `mathfont`’s error messages are self-explanatory, and the help text will contain instructions for how to resolve the message. Nevertheless, some of the possible error messages warrant additional explanation.

The most salient error is the “Missing \XeTeX or \LuaTeX ” message. If a user tries to load `mathfont` without one of these two engines, \TeX will crash, either through `mathfont`’s fatal error message or when `fontspec` performs its own engine checks. Advanced users should note that `mathfont` doesn’t actually determine the typesetting engine. Rather, it checks whether the \XeTeX and \LuaTeX primitives `\Umathcode` and `\Umathchardef` are defined, so if for some reason these control sequences have definitions when the user loads `mathfont`, `fontspec`’s more robust engine checks will cause \TeX to abort. The reasoning here is straightforward: `mathfont` verifies only that the current typesetting engine provides the commands that it directly needs, so its potential functionality remains as broad as possible. If `fontspec` becomes compatible with a third engine that also provides (analogues of) `\Umathcode` and

Table 4: Greek Character Control Sequences

Modern Greek Characters		Ancient Greek Characters	
Capital	Minuscule	Capital	Minuscule
<code>\Alpha</code>	<code>\alpha</code>	<code>\Heta</code>	<code>\heta</code>
<code>\Beta</code>	<code>\beta</code>	<code>\Sampi</code>	<code>\sampi</code>
<code>\Gamma</code>	<code>\gamma</code>	<code>\Diagamma</code>	<code>\diagama</code>
<code>\Delta</code>	<code>\delta</code>	<code>\Koppa</code>	<code>\koppa</code>
<code>\Epsilon</code>	<code>\epsilon</code>	<code>\Stigma</code>	<code>\stigma</code>
<code>\Zeta</code>	<code>\zeta</code>	<code>\Sho</code>	<code>\sho</code>
<code>\Eta</code>	<code>\eta</code>	<code>\San</code>	<code>\san</code>
<code>\Theta</code>	<code>\theta</code>	<code>\varSampi</code>	<code>\varsampi</code>
<code>\Iota</code>	<code>\iota</code>	<code>\varDiagamma</code>	<code>\vardiagamma</code>
<code>\Kappa</code>	<code>\kappa</code>	<code>\varKoppa</code>	<code>\varkoppa</code>
<code>\Lambda</code>	<code>\lambda</code>		
<code>\Mu</code>	<code>\mu</code>		
<code>\Nu</code>	<code>\nu</code>		
<code>\Xi</code>	<code>\xi</code>		
<code>\Omicron</code>	<code>\omicron</code>		
<code>\Pi</code>	<code>\pi</code>		
<code>\Rho</code>	<code>\rho</code>		
<code>\Sigma</code>	<code>\sigma</code>		
<code>\Tau</code>	<code>\tau</code>		
<code>\Upsilon</code>	<code>\upsilon</code>		
<code>\Phi</code>	<code>\phi</code>		
<code>\Chi</code>	<code>\chi</code>		
<code>\Psi</code>	<code>\psi</code>		
<code>\Omega</code>	<code>\omega</code>		
<code>\varTheta</code>	<code>\varbeta</code>		
	<code>\varepsilon</code>		
	<code>\vartheta</code>		
	<code>\varrho</code>		
	<code>\varsigma</code>		
	<code>\varphi</code>		

`\Umathchardef`, there is no reason to prevent `mathfont` from working with that engine as well. The obvious corollary to this setup is that users with very old `XYTeX` or `LuaTeX` distributions could see this fatal error even when running one of these engines, and the solution is probably to upgrade a more recent version of the engine in question. Unfortunately, I do not know exactly when `XYTeX` and `LuaTeX` introduced these primitives.

The `fontspec` package includes a “no-math” option, and `mathfont` expects `fontspec` to be loaded with this option. As mentioned previously, `mathfont` loads `fontspec` by default, but users can load `fontspec` before `mathfont` if they want to manually specify the package options. Alternatively, `LATeX`’s `\PassOptionsToPackage` may be an even better way to proceed. If

`mathfont` detects that `fontspec` was loaded without the `no-math` option, it will issue an error message saying so. This error is not paramount in the sense that the document will compile almost normally if a user ignores it, but `mathfont` will probably have trouble changing the font of certain math-mode characters in this situation. During development, Arabic numerals posed a particular issue in this regard.

The “internal commands restored” error arises when the user calls `\mathfont` in a situation where `mathfont` has already restored the small portion of the \LaTeX kernel that it adjusts when loaded. Unless the user loads `mathfont` with the `packages` option, this process happens when the user loads an additional package after `mathfont`, and `mathfont` will not carry out a call to `\mathfont` at that point. As mentioned previously, users who want to manually restore the \LaTeX kernel can do so with the `\restoremathinternals` command.

Users who receive an “Invalid option” error for `\mathfont` should make sure they removed any extra spaces from their list of keywords in the command’s optional argument. It is also worth pointing out if the user tries to reset the default font for some characters with `\mathfont`, the package will issue a warning but will not halt the compilation process.

What should you do if you can’t resolve an error? First, always, always make sure that you spelled all of your commands correctly and closed all braces and brackets. Then check the `mathfont` documentation—you may be trying to do something outside the scope of the package, or you may be dealing with a special case. In particular, read all the sections of the documentation that relate to the command or commands you are having trouble with! It is possible (likely) that I have organized the information here differently from your ideal package documentation, so you may be looking in the wrong portions of the documentation for help. The internet is a great resource, and websites such as the \TeX StackExchange, Share \LaTeX , and Wikibooks’s \LaTeX wiki are often invaluable in dealing with \TeX -related issues. Definitely ask another human as well! At that point, and only at that point, should you email the author about your code. If you believe that you have found a bug, please indicate that clearly in your email subject line! Please also include a minimal working example that demonstrates the problem in any such correspondence. I will make every effort to write back to emails about `mathfont`, but I cannot guarantee a timely response.

Implementation

First and foremost, the package needs to declare itself. The `packages` option changes the `\if@packages` boolean from false to true.

```
1 \NeedsTeXFormat{LaTeX2e}
2 \ProvidesPackage{mathfont}[2018/06/14 v. 1.1b Package mathfont]
3 \newif\if@packages
4 \DeclareOption{packages}{\@packagestrue}
5 \DeclareOption*{\PackageError{mathfont}
6   {Option "\CurrentOption" unknown}
7   {I'm ignoring that option because\MessageBreak
8     I don't know what it means.}}
9 \ProcessOptions\relax
```

Some error and informational messages.

```
10 \def\M@FontChangeInfo#1{\PackageInfo{mathfont}
11   {Changing #1 characters to\MessageBreak
12     math font \csname M@font\the\M@count\endcsname\MessageBreak
13     with \csname @#1 shape\endcsname\MessageBreak
14     shape}}
15 \def\M@NewFontCommandInfo#1#2#3#4{\PackageInfo{mathfont}
16   {Creating math alphabet\MessageBreak
17     command \string#1 using #2\MessageBreak
18     with series #3 and shape\MessageBreak
19     #4}}
20 \def\M@CommandInitializeInfo#1{\PackageInfo{mathfont}
21   {Initializing #1 font-change\MessageBreak
22     command}}
23 \def\M@SetInternalsInfo{\PackageInfo{mathfont}
24   {Adjusting \string\set@mathchar\space and\MessageBreak
25     \string\set@mathcode}}
26 \def\M@RestoreInternalsInfo{\PackageInfo{mathfont}
27   {Restoring \string\set@mathchar\space and\MessageBreak
28     \string\set@mathcode}}
29 \def\M@CharsSetWarning#1{\PackageWarning{mathfont}
30   {Font for #1 chars has already\MessageBreak
31     been set}}
32 \def\M@NoMathError{\PackageError{mathfont}
33   {Package fontspec was loaded\MessageBreak
34     without the "no-math" option}
35   {This isn't really an error--\MessageBreak
36     it's fine to load fontspec\MessageBreak
37     without "no-math." However,\MessageBreak
38     strange things could happen,\MessageBreak
39     so beware of any sudden and\MessageBreak
40     unexpected font changes. To\MessageBreak
41     resolve this error message,\MessageBreak
42     load fontspec with the "no-\MessageBreak
```

```

43 math" option. If you haven't\MessageBreak
44 loaded fontspec manually, try\MessageBreak
45 loading mathfont earlier in\MessageBreak
46 your preamble.}}
47 \def\M@InvalidOptionError#1{\PackageError{mathfont}
48 {Invalid option "#1"\MessageBreak for \string\mathfont}
49 {Hm. Check that you spelled the\MessageBreak
50 option correctly and didn't include\MessageBreak
51 any extra spaces. Otherwise, I'm\MessageBreak
52 not sure what's wrong. Is this\MessageBreak
53 option listed in the package\MessageBreak
54 documentation?}}
55 \def\M@InternalsRestoredError{\PackageError{mathfont}
56 {Internal commands restored}
57 {This package slightly changes two LaTeX\MessageBreak
58 internal commands, and you really shouldn't\MessageBreak
59 be loading new math fonts without those\MessageBreak
60 adjustments. What happened here is that you\MessageBreak
61 used \string\mathfont\space in a situation
62 where those\MessageBreak
63 two commands retain their original defini-\MessageBreak
64 tions. Presumably you used
65 \string\mathfont\space after\MessageBreak
66 loading another package or calling the\MessageBreak
67 \string\restoremathinternals\space
68 command, and in any\MessageBreak
69 event, I'm going to ignore this call to\MessageBreak
70 \string\mathfont. Try retypesetting this document\MessageBreak
71 with all \string\mathfont\space
72 commands immediately\MessageBreak
73 after \string\usepackage{mathfont}.}}
74 \def\M@MissingControlSequenceError#1{\PackageError{mathfont}
75 {Improper argument\MessageBreak
76 for \string#1}
77 {Please use a control sequence as the\MessageBreak
78 first argument of \string#1.}}
79 \def\M@HModeError#1{\PackageError{mathfont}
80 {Missing \string$ inserted.\MessageBreak
81 Command \string#1 must be used in\MessageBreak
82 math mode}
83 {I generated an error because\MessageBreak
84 you used \string#1 outside of\MessageBreak
85 math mode. I've inserted a \string$\MessageBreak
86 just before your \string#1, so\MessageBreak
87 we should be all good now.}}
88 \def\M@XeTeXLuaTeXError{\PackageError{mathfont}
89 {!!!FATAL ERROR!! : Missing XeTeX or LuaTeX}

```

```

90 {This package requires either\MessageBreak
91 XeLaTeX or LuaLaTeX. Please\MessageBreak
92 retypeset this document with\MessageBreak
93 one of those two engines. This\MessageBreak
94 error is fatal, so I'm going\MessageBreak
95 to stop processing once you\MessageBreak
96 push enter.}\@@end}

```

Check if the current engine has defined the necessary primitives.

```

97 \ifx\Umathcode\@undefined
98 \else
99   \ifx\Umathchardef\@undefined
100   \else
101     \let\M@XeTeXLuaTeXError\relax
102   \fi
103 \fi
104 \M@XeTeXLuaTeXError

```

We load the `fontspec` package in order to use its main font loading mechanism, and we `\let` the macro `\@newfont` 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.

```

105 \@ifpackageloaded{fontspec}
106   {\ifnum\csname g__fontspec_math_bool\endcsname=1
107     \M@NoMathError
108   \fi}{\RequirePackage[no-math]{fontspec}}
109 \expandafter\let\expandafter\@newfont
110   \csname fontspec_set_family:Nnn\endcsname

```

We save `\set@mathchar` and `\set@mathsymbol` from the \LaTeX 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 \XeTeX and \LuaTeX primitives `\Umathcode` and `\Umathchardef`. The unicode primitives support decimal input using a `+` sign, and we take advantage of that feature to avoid hexadecimal conversions.

```

111 \M@SetInternalsInfo
112 \let\@@set@mathchar\set@mathchar
113 \let\@@set@mathsymbol\set@mathsymbol
114 \def\set@mathchar#1#2#3#4{%
115   \multiply\count\z@ by 16\relax
116   \advance\count\z@\count\tw@
117   \global\Umathcode'#2=\mathchar@type#3+#1+\count\z@}
118 \def\set@mathsymbol#1#2#3#4{%
119   \multiply\count\z@ by 16\relax
120   \advance\count\z@\count\tw@
121   \global\Umathchardef#2\mathchar@type#3+#1+\count\z@}

```

We need to keep track of the number of times we have loaded a font. The count `\M@count` fulfills this role.

```

122 \newcount\M@count

```

```
123 \M@count\z@
```

We create necessary booleans and the default math font shapes.

```
124 \newif\if@upper
125 \newif\if@lower
126 \newif\if@greekupper
127 \newif\if@greeklower
128 \newif\if@operator
129 \newif\if@digits
130 \newif\if@bb
131 \newif\if@cal
132 \newif\if@frak
133 \newif\if@bcal
134 \newif\if@bfrak
135 \newif\if@suboptionpresent
136 \def\@uppershape{italic}
137 \def\@lowershape{italic}
138 \def\@greekuppershape{roman}
139 \def\@greeklowershape{italic}
140 \def\@digitssshape{roman}
141 \def\@operatorshape{roman}
142 \def\@bbshape{roman}
143 \def\@calshape{roman}
144 \def\@frakshape{roman}
145 \def\@bcalshape{roman}
146 \def\@bfrakshape{roman}
```

We want to allow the user to specify options using an `xkeyval`-type syntax. However, we do not need the full package; a slim 31 lines of code will suffice. The macro `\check@suboption` determines whether the user specified a keyword option for `\mathfont` using a `key=value` input and stores both the option and corresponding suboption, if applicable, in `\@tempa` and `\@tempb` respectively.

```
147 \def\strip@equals#1={#1}
148 \def\check@suboption#1=#2\@nil{%
149   \def\@tempa{#1}
150   \def\@tempb{#2}
151   \check@option@valid\@tempa
152   \ifx\@tempb\@empty
153     \@suboptionpresentfalse
154   \else
155     \edef\@tempb{\expandafter\strip@equals\@tempb}
156     \check@suboption@valid\@tempb
157     \@suboptionpresenttrue
158   \fi}
```

The commands `\check@option@valid` and `\check@suboption@valid` confirm that the keyword option and suboption are legitimate. If not, `mathfont` issues an error.

```
159 \def\check@option@valid#1{%
160   \def\@temperror{\M@InvalidOptionError{#1}}
```

```

161 \@for\@j:=upper,lower,greekupper,greeklower,digits,operator\do{%
162     \ifx\@j#1
163         \let\@temperror\relax
164     \fi}

```

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. The `\define@<keyword>` macro does this.

```

165 \@for\@j:=bb,cal,frak,bcal,bfrak\do{%
166     \ifx\@j#1
167         \let\@temperror\relax
168         \csname define@\@j\endcsname
169     \fi}
170 \@temperror}
171 \def\check@suboption@valid#1{%
172     \def\@temperror{\M@InvalidOptionError{#1}}
173     \@for\@j:=roman,italic\do{%
174         \ifx\@j#1
175             \let\@temperror\relax
176         \fi}
177     \@temperror}

```

Implementation of Default Font Changes

The user-level command `\mathfont` passes its mandatory argument to `\@newfont` through the `\@mathfont` command. If the user includes `\mathfont` with an optional argument, `\@mathfont` will loop through each item in the optional argument using `\@for` and set the math font for each of those classes of characters. If the user does not specify an optional argument, `\mathfont` calls `\@mathfont` with the list of entries from Table 1 in brackets. The `\@mathfont` macro proceeds in several steps. First, it checks if `\set@mathchar` has been reset, and if so, the current call to `\mathfont` will do nothing. If not, the macro loads the user's font with `\@newfont` and checks its keyword optional arguments. The command declares the appropriate symbol fonts if necessary, actually sets the math font by calling `\M@<keyword>\set` command, and records that the font change occurred by switching the appropriate boolean to true. Finally, `\@mathfont` increments `\M@count` by one.

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 keyword from Tables 1 and 2, the package originally defines `\@<keyword>shape` as the default shape for that collection of characters. 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` to the value of the suboption. For example, suppose the loads `mathfont` and then immediately writes

```
\mathfont[upper=roman]{Helvetica}.
```

In this situation, `mathfont` would define `\M@font0` to be the internal name of Helvetica,

and the corresponding symbol font names would be `Mroman0` and `Mitalic0`. Because the user specified a suboption, `\@mathfont` would redefine `\M@uppershape` to the token string “`roman`,” and the package will use `\M@uppershape` later to specify the symbol font for capital Latin characters.

```

178 \def\gobble@equals#1=#2\@nil{#1}
179 \def\mathfont{\@ifnextchar[{\@mathfont}
180   {\@mathfont[upper,lower,greekupper,greeklower,digits,operator]}}
181 \def\@mathfont[#1]#2{%
182   \ifx\@set@mathchar\set@mathchar
183     \M@InternalsRestoredError
184   \else
185     \expandafter\@newfont\csname M@font\the\M@count\endcsname{}\{#2}
186     \@for\@i:=#1\do{\expandafter\check@suboption\@i=\@nil

```

If the user calls `\mathfont` and tries to reset 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 wouldn’t realize that `\csname if@\@tempa\endcsname` matches the eventual `\fi`, and the `\@for` loop would break. (\TeX does not have a smart if-parser!)

```

187     \expandafter\ifx\csname if@\@tempa\endcsname
188       \csname iftrue\endcsname
189     \M@CharsSetWarning{\@tempa}
190   \else

```

Handle the case with a suboption.

```

191     \if@suboptionpresent
192       \expandafter\edef\csname @\@tempa shape\endcsname{\@tempb}
193     \fi

```

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

```

194     \def\@tempb{roman}
195     \expandafter\ifx\csname @\@tempa shape\endcsname\@tempb
196       \@ifundefined{symMroman\the\M@count}{%
197         \DeclareSymbolFont{Mroman\the\M@count}{TU}
198         {\csname M@font\the\M@count\endcsname}{m}{n}}{}
199     \fi
200     \def\@tempb{italic}
201     \expandafter\ifx\csname @\@tempa shape\endcsname\@tempb
202       \@ifundefined{symMitalic\the\M@count}{%
203         \DeclareSymbolFont{Mitalic\the\M@count}{TU}
204         {\csname M@font\the\M@count\endcsname}{m}{it}}{}
205     \fi

```

And now the magic happens.

```

206     \M@FontChangeInfo{\@tempa}
207     \csname M@\@tempa @set\endcsname
208     \csname @\@tempa true\endcsname
209   \fi}

```

```

210 \advance\M@count\@ne\relax
211 \fi}
212 \@onlypreamble\mathfont

```

Implementation of 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. First, we check to make sure that the user provided a control sequence for the first argument of `\newmathfontcommand`, and if the user did not, `\check@csarg` issues an error.

```

213 \def\check@csarg#1#2#3{%
214 \ifcat\relax\noexpand#2
215 \def\@tempa{#2}
216 \@newfont\@tempb{}{#3}
217 \expandafter\@newmathfontcommand
218 \else
219 \M@MissingControlSequenceError#1
220 \fi}

```

Now declare the math alphabet.

```

221 \def\@newmathfontcommand#1#2{\expandafter
222 \DeclareMathAlphabet\expandafter{\@tempa}{TU}{\@tempb}{#1}{#2}}
223 \def\newmathfontcommand{\check@csarg\newmathfontcommand}
224 \@onlypreamble\newmathfontcommand

```

Then provide the four default versions.

```

225 \def\newmathrm#1#2{\check@csarg\newmathrm{#1}{#2}{m}{n}}
226 \def\newmathit#1#2{\check@csarg\newmathit{#1}{#2}{m}{it}}
227 \def\newmathbold#1#2{\check@csarg\newmathbold{#1}{#2}{b}{n}}
228 \def\newmathboldit#1#2{\check@csarg\newmathboldit{#1}{#2}{b}{it}}
229 \@onlypreamble\newmathrm
230 \@onlypreamble\newmathit
231 \@onlypreamble\newmathbold
232 \@onlypreamble\newmathboldit

```

Implementation of 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 `\check@mmode` 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.

```

233 \def\check@mmode#1#2{%
234 \let\@tempa#2%
235 \ifmmode
236 \expandafter\@tempa

```

```

237 \else
238   \leavevmode\M@HModeError#1%
239   \expandafter$\expandafter\@tempa
240 \fi}
241 \def\process@tokens#1#2{\@tfor\@k:=#1\do{\csname M@#2@\@k\endcsname}}
242 \def\define@bb{%
243   \M@CommandInitializeInfo{blackboard bold}
244   \def\mathbb{\check@mmode\mathbb\@mathbb}
245   \def\@mathbb##1{\process@tokens{##1}{bb}}}
246 \def\define@cal{%
247   \M@CommandInitializeInfo{calligraphic}
248   \def\mathcal{\check@mmode\mathcal\@mathcal}
249   \def\@mathcal##1{\process@tokens{##1}{cal}}}
250 \def\define@frak{%
251   \M@CommandInitializeInfo{fraktur}
252   \def\mathfrak{\check@mmode\mathfrak\@mathfrak}
253   \def\@mathfrak##1{\process@tokens{##1}{frak}}}
254 \def\define@bcal{%
255   \M@CommandInitializeInfo{bold calligraphic}
256   \def\mathbcal{\check@mmode\mathbcal\@mathbcal}
257   \def\@mathbcal##1{\process@tokens{##1}{bcal}}}
258 \def\define@bfrak{%
259   \M@CommandInitializeInfo{bold fraktur}
260   \def\mathbfrak{\check@mmode\mathbfrak\@mathbfrak}
261   \def\@mathbfrak##1{\process@tokens{##1}{bfrak}}}

```

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`.

```

262 \def\M@upper@set{%
263   \edef\M@upper{M\@uppershape\the\M@count}
264   \DeclareMathSymbol{A}{\mathalpha}{\M@upper}{‘A}
265   \DeclareMathSymbol{B}{\mathalpha}{\M@upper}{‘B}
266   \DeclareMathSymbol{C}{\mathalpha}{\M@upper}{‘C}
267   \DeclareMathSymbol{D}{\mathalpha}{\M@upper}{‘D}
268   \DeclareMathSymbol{E}{\mathalpha}{\M@upper}{‘E}
269   \DeclareMathSymbol{F}{\mathalpha}{\M@upper}{‘F}
270   \DeclareMathSymbol{G}{\mathalpha}{\M@upper}{‘G}
271   \DeclareMathSymbol{H}{\mathalpha}{\M@upper}{‘H}
272   \DeclareMathSymbol{I}{\mathalpha}{\M@upper}{‘I}
273   \DeclareMathSymbol{J}{\mathalpha}{\M@upper}{‘J}
274   \DeclareMathSymbol{K}{\mathalpha}{\M@upper}{‘K}
275   \DeclareMathSymbol{L}{\mathalpha}{\M@upper}{‘L}
276   \DeclareMathSymbol{M}{\mathalpha}{\M@upper}{‘M}
277   \DeclareMathSymbol{N}{\mathalpha}{\M@upper}{‘N}

```



```

278 \DeclareMathSymbol{O}{\mathalpha}{\M@upper}{‘O}
279 \DeclareMathSymbol{P}{\mathalpha}{\M@upper}{‘P}
280 \DeclareMathSymbol{Q}{\mathalpha}{\M@upper}{‘Q}
281 \DeclareMathSymbol{R}{\mathalpha}{\M@upper}{‘R}
282 \DeclareMathSymbol{S}{\mathalpha}{\M@upper}{‘S}
283 \DeclareMathSymbol{T}{\mathalpha}{\M@upper}{‘T}
284 \DeclareMathSymbol{U}{\mathalpha}{\M@upper}{‘U}
285 \DeclareMathSymbol{V}{\mathalpha}{\M@upper}{‘V}
286 \DeclareMathSymbol{W}{\mathalpha}{\M@upper}{‘W}
287 \DeclareMathSymbol{X}{\mathalpha}{\M@upper}{‘X}
288 \DeclareMathSymbol{Y}{\mathalpha}{\M@upper}{‘Y}
289 \DeclareMathSymbol{Z}{\mathalpha}{\M@upper}{‘Z}}

```

Set minuscule Latin characters.

```

290 \def\M@lower@set{%
291   \edef\M@lower{\M@lowershape\the\M@count}
292   \DeclareMathSymbol{a}{\mathalpha}{\M@lower}{‘a}
293   \DeclareMathSymbol{b}{\mathalpha}{\M@lower}{‘b}
294   \DeclareMathSymbol{c}{\mathalpha}{\M@lower}{‘c}
295   \DeclareMathSymbol{d}{\mathalpha}{\M@lower}{‘d}
296   \DeclareMathSymbol{e}{\mathalpha}{\M@lower}{‘e}
297   \DeclareMathSymbol{f}{\mathalpha}{\M@lower}{‘f}
298   \DeclareMathSymbol{g}{\mathalpha}{\M@lower}{‘g}
299   \DeclareMathSymbol{h}{\mathalpha}{\M@lower}{‘h}
300   \DeclareMathSymbol{i}{\mathalpha}{\M@lower}{‘i}
301   \DeclareMathSymbol{j}{\mathalpha}{\M@lower}{‘j}
302   \DeclareMathSymbol{k}{\mathalpha}{\M@lower}{‘k}
303   \DeclareMathSymbol{l}{\mathalpha}{\M@lower}{‘l}
304   \DeclareMathSymbol{m}{\mathalpha}{\M@lower}{‘m}
305   \DeclareMathSymbol{n}{\mathalpha}{\M@lower}{‘n}
306   \DeclareMathSymbol{o}{\mathalpha}{\M@lower}{‘o}
307   \DeclareMathSymbol{p}{\mathalpha}{\M@lower}{‘p}
308   \DeclareMathSymbol{q}{\mathalpha}{\M@lower}{‘q}
309   \DeclareMathSymbol{r}{\mathalpha}{\M@lower}{‘r}
310   \DeclareMathSymbol{s}{\mathalpha}{\M@lower}{‘s}
311   \DeclareMathSymbol{t}{\mathalpha}{\M@lower}{‘t}
312   \DeclareMathSymbol{u}{\mathalpha}{\M@lower}{‘u}
313   \DeclareMathSymbol{v}{\mathalpha}{\M@lower}{‘v}
314   \DeclareMathSymbol{w}{\mathalpha}{\M@lower}{‘w}
315   \DeclareMathSymbol{x}{\mathalpha}{\M@lower}{‘x}
316   \DeclareMathSymbol{y}{\mathalpha}{\M@lower}{‘y}
317   \DeclareMathSymbol{z}{\mathalpha}{\M@lower}{‘z}}

```

Set capital Greek characters.

```

318 \def\M@greekupper@set{%
319   \edef\M@greekupper{\M@greekuppershape\the\M@count}
320   \DeclareMathSymbol{\Alpha}{\mathalpha}{\M@greekupper}{"391}
321   \DeclareMathSymbol{\Beta}{\mathalpha}{\M@greekupper}{"392}
322   \DeclareMathSymbol{\Gamma}{\mathalpha}{\M@greekupper}{"393}

```

```

323 \DeclareMathSymbol{\Delta}{\mathalpha}{\M@greekupper}{"394}
324 \DeclareMathSymbol{\Epsilon}{\mathalpha}{\M@greekupper}{"395}
325 \DeclareMathSymbol{\Zeta}{\mathalpha}{\M@greekupper}{"396}
326 \DeclareMathSymbol{\Eta}{\mathalpha}{\M@greekupper}{"397}
327 \DeclareMathSymbol{\Theta}{\mathalpha}{\M@greekupper}{"398}
328 \DeclareMathSymbol{\Iota}{\mathalpha}{\M@greekupper}{"399}
329 \DeclareMathSymbol{\Kappa}{\mathalpha}{\M@greekupper}{"39A}
330 \DeclareMathSymbol{\Lambda}{\mathalpha}{\M@greekupper}{"39B}
331 \DeclareMathSymbol{\Mu}{\mathalpha}{\M@greekupper}{"39C}
332 \DeclareMathSymbol{\Nu}{\mathalpha}{\M@greekupper}{"39D}
333 \DeclareMathSymbol{\Xi}{\mathalpha}{\M@greekupper}{"39E}
334 \DeclareMathSymbol{\Omicron}{\mathalpha}{\M@greekupper}{"39F}
335 \DeclareMathSymbol{\Pi}{\mathalpha}{\M@greekupper}{"3A0}
336 \DeclareMathSymbol{\Rho}{\mathalpha}{\M@greekupper}{"3A1}
337 \DeclareMathSymbol{\Sigma}{\mathalpha}{\M@greekupper}{"3A3}
338 \DeclareMathSymbol{\Tau}{\mathalpha}{\M@greekupper}{"3A4}
339 \DeclareMathSymbol{\Upsilon}{\mathalpha}{\M@greekupper}{"3A5}
340 \DeclareMathSymbol{\Phi}{\mathalpha}{\M@greekupper}{"3A6}
341 \DeclareMathSymbol{\Chi}{\mathalpha}{\M@greekupper}{"3A7}
342 \DeclareMathSymbol{\Psi}{\mathalpha}{\M@greekupper}{"3A8}
343 \DeclareMathSymbol{\Omega}{\mathalpha}{\M@greekupper}{"3A9}
344 \DeclareMathSymbol{\varTheta}{\mathalpha}{\M@greekupper}{"3F4}
345 \DeclareMathSymbol{\Heta}{\mathalpha}{\M@greekupper}{"370}
346 \DeclareMathSymbol{\Sampi}{\mathalpha}{\M@greekupper}{"3E0}
347 \DeclareMathSymbol{\Diagamma}{\mathalpha}{\M@greekupper}{"3DC}
348 \DeclareMathSymbol{\Koppa}{\mathalpha}{\M@greekupper}{"3D8}
349 \DeclareMathSymbol{\Stigma}{\mathalpha}{\M@greekupper}{"3DA}
350 \DeclareMathSymbol{\Sho}{\mathalpha}{\M@greekupper}{"3F7}
351 \DeclareMathSymbol{\San}{\mathalpha}{\M@greekupper}{"3FA}
352 \DeclareMathSymbol{\varSampi}{\mathalpha}{\M@greekupper}{"372}
353 \DeclareMathSymbol{\varDiagamma}{\mathalpha}{\M@greekupper}{"376}
354 \DeclareMathSymbol{\varKoppa}{\mathalpha}{\M@greekupper}{"3DE}

```

Set minuscule Greek characters.

```

355 \def\M@greeklower@set{%
356   \edef\M@greeklower{\M@greeklowershape\the\M@count}
357   \DeclareMathSymbol{\alpha}{\mathalpha}{\M@greeklower}{"3B1}
358   \DeclareMathSymbol{\beta}{\mathalpha}{\M@greeklower}{"3B2}
359   \DeclareMathSymbol{\gamma}{\mathalpha}{\M@greeklower}{"3B3}
360   \DeclareMathSymbol{\delta}{\mathalpha}{\M@greeklower}{"3B4}
361   \DeclareMathSymbol{\epsilon}{\mathalpha}{\M@greeklower}{"3F5}
362   \DeclareMathSymbol{\zeta}{\mathalpha}{\M@greeklower}{"3B6}
363   \DeclareMathSymbol{\eta}{\mathalpha}{\M@greeklower}{"3B7}
364   \DeclareMathSymbol{\theta}{\mathalpha}{\M@greeklower}{"3B8}
365   \DeclareMathSymbol{\iota}{\mathalpha}{\M@greeklower}{"3B9}
366   \DeclareMathSymbol{\kappa}{\mathalpha}{\M@greeklower}{"3BA}
367   \DeclareMathSymbol{\lambda}{\mathalpha}{\M@greeklower}{"3BB}
368   \DeclareMathSymbol{\mu}{\mathalpha}{\M@greeklower}{"3BC}

```

```

369 \DeclareMathSymbol{\nu}{\mathalpha}{\M@greeklower}{"3BD}
370 \DeclareMathSymbol{\xi}{\mathalpha}{\M@greeklower}{"3BE}
371 \DeclareMathSymbol{\omicron}{\mathalpha}{\M@greeklower}{"3BF}
372 \DeclareMathSymbol{\pi}{\mathalpha}{\M@greeklower}{"3C0}
373 \DeclareMathSymbol{\rho}{\mathalpha}{\M@greeklower}{"3C1}
374 \DeclareMathSymbol{\sigma}{\mathalpha}{\M@greeklower}{"3C3}
375 \DeclareMathSymbol{\tau}{\mathalpha}{\M@greeklower}{"3C4}
376 \DeclareMathSymbol{\upsilon}{\mathalpha}{\M@greeklower}{"3C5}
377 \DeclareMathSymbol{\phi}{\mathalpha}{\M@greeklower}{"3D5}
378 \DeclareMathSymbol{\chi}{\mathalpha}{\M@greeklower}{"3C7}
379 \DeclareMathSymbol{\psi}{\mathalpha}{\M@greeklower}{"3C8}
380 \DeclareMathSymbol{\omega}{\mathalpha}{\M@greeklower}{"3C9}
381 \DeclareMathSymbol{\varbeta}{\mathalpha}{\M@greeklower}{"3D0}
382 \DeclareMathSymbol{\varepsilon}{\mathalpha}{\M@greeklower}{"3B5}
383 \DeclareMathSymbol{\vartheta}{\mathalpha}{\M@greeklower}{"3D1}
384 \DeclareMathSymbol{\varrho}{\mathalpha}{\M@greeklower}{"3F1}
385 \DeclareMathSymbol{\varsigma}{\mathalpha}{\M@greeklower}{"3C2}
386 \DeclareMathSymbol{\varphi}{\mathalpha}{\M@greeklower}{"3C6}
387 \DeclareMathSymbol{\heta}{\mathalpha}{\M@greeklower}{"371}
388 \DeclareMathSymbol{\sampi}{\mathalpha}{\M@greeklower}{"3E1}
389 \DeclareMathSymbol{\diagamma}{\mathalpha}{\M@greeklower}{"3DD}
390 \DeclareMathSymbol{\koppa}{\mathalpha}{\M@greeklower}{"3D9}
391 \DeclareMathSymbol{\stigma}{\mathalpha}{\M@greeklower}{"3DB}
392 \DeclareMathSymbol{\sho}{\mathalpha}{\M@greeklower}{"3F8}
393 \DeclareMathSymbol{\san}{\mathalpha}{\M@greeklower}{"3FB}
394 \DeclareMathSymbol{\varsampi}{\mathalpha}{\M@greeklower}{"373}
395 \DeclareMathSymbol{\vardiagamma}{\mathalpha}{\M@greeklower}{"377}
396 \DeclareMathSymbol{\varkoppa}{\mathalpha}{\M@greeklower}{"3DF}

```

Set digits.

```

397 \def\M@digits@set{%
398   \edef\M@digits{M@digitsshape\the\M@count}
399   \DeclareMathSymbol{0}{\mathalpha}{\M@digits}{'0}
400   \DeclareMathSymbol{1}{\mathalpha}{\M@digits}{'1}
401   \DeclareMathSymbol{2}{\mathalpha}{\M@digits}{'2}
402   \DeclareMathSymbol{3}{\mathalpha}{\M@digits}{'3}
403   \DeclareMathSymbol{4}{\mathalpha}{\M@digits}{'4}
404   \DeclareMathSymbol{5}{\mathalpha}{\M@digits}{'5}
405   \DeclareMathSymbol{6}{\mathalpha}{\M@digits}{'6}
406   \DeclareMathSymbol{7}{\mathalpha}{\M@digits}{'7}
407   \DeclareMathSymbol{8}{\mathalpha}{\M@digits}{'8}
408   \DeclareMathSymbol{9}{\mathalpha}{\M@digits}{'9}}

```

Set new operator font.

```

409 \def\M@operator@set{%
410   \edef\operator@font{\noexpand\mathgroup
411     \expandafter\noexpand
412     \csname symM\@operatorshape\the\M@count\endcsname}}

```

Set blackboard bold characters.

```

413 \def\M@bb@set{%
414   \edef\M@bb{M\@bbshape\the\M@count}
415   \DeclareMathSymbol{\M@bb@A}{\mathord}{\M@bb}{"1D538}
416   \DeclareMathSymbol{\M@bb@B}{\mathord}{\M@bb}{"1D539}
417   \DeclareMathSymbol{\M@bb@C}{\mathord}{\M@bb}{"2102}
418   \DeclareMathSymbol{\M@bb@D}{\mathord}{\M@bb}{"1D53B}
419   \DeclareMathSymbol{\M@bb@E}{\mathord}{\M@bb}{"1D53C}
420   \DeclareMathSymbol{\M@bb@F}{\mathord}{\M@bb}{"1D53D}
421   \DeclareMathSymbol{\M@bb@G}{\mathord}{\M@bb}{"1D53E}
422   \DeclareMathSymbol{\M@bb@H}{\mathord}{\M@bb}{"210D}
423   \DeclareMathSymbol{\M@bb@I}{\mathord}{\M@bb}{"1D540}
424   \DeclareMathSymbol{\M@bb@J}{\mathord}{\M@bb}{"1D541}
425   \DeclareMathSymbol{\M@bb@K}{\mathord}{\M@bb}{"1D542}
426   \DeclareMathSymbol{\M@bb@L}{\mathord}{\M@bb}{"1D543}
427   \DeclareMathSymbol{\M@bb@M}{\mathord}{\M@bb}{"1D544}
428   \DeclareMathSymbol{\M@bb@N}{\mathord}{\M@bb}{"2115}
429   \DeclareMathSymbol{\M@bb@O}{\mathord}{\M@bb}{"1D546}
430   \DeclareMathSymbol{\M@bb@P}{\mathord}{\M@bb}{"2119}
431   \DeclareMathSymbol{\M@bb@Q}{\mathord}{\M@bb}{"211A}
432   \DeclareMathSymbol{\M@bb@R}{\mathord}{\M@bb}{"211D}
433   \DeclareMathSymbol{\M@bb@S}{\mathord}{\M@bb}{"1D54A}
434   \DeclareMathSymbol{\M@bb@T}{\mathord}{\M@bb}{"1D54B}
435   \DeclareMathSymbol{\M@bb@U}{\mathord}{\M@bb}{"1D54C}
436   \DeclareMathSymbol{\M@bb@V}{\mathord}{\M@bb}{"1D54D}
437   \DeclareMathSymbol{\M@bb@W}{\mathord}{\M@bb}{"1D54E}
438   \DeclareMathSymbol{\M@bb@X}{\mathord}{\M@bb}{"1D43F}
439   \DeclareMathSymbol{\M@bb@Y}{\mathord}{\M@bb}{"1D550}
440   \DeclareMathSymbol{\M@bb@Z}{\mathord}{\M@bb}{"2124}
441   \DeclareMathSymbol{\M@bb@a}{\mathord}{\M@bb}{"1D552}
442   \DeclareMathSymbol{\M@bb@b}{\mathord}{\M@bb}{"1D553}
443   \DeclareMathSymbol{\M@bb@c}{\mathord}{\M@bb}{"1D554}
444   \DeclareMathSymbol{\M@bb@d}{\mathord}{\M@bb}{"1D555}
445   \DeclareMathSymbol{\M@bb@e}{\mathord}{\M@bb}{"1D556}
446   \DeclareMathSymbol{\M@bb@f}{\mathord}{\M@bb}{"1D557}
447   \DeclareMathSymbol{\M@bb@g}{\mathord}{\M@bb}{"1D558}
448   \DeclareMathSymbol{\M@bb@h}{\mathord}{\M@bb}{"1D559}
449   \DeclareMathSymbol{\M@bb@i}{\mathord}{\M@bb}{"1D55A}
450   \DeclareMathSymbol{\M@bb@j}{\mathord}{\M@bb}{"1D55B}
451   \DeclareMathSymbol{\M@bb@k}{\mathord}{\M@bb}{"1D55C}
452   \DeclareMathSymbol{\M@bb@l}{\mathord}{\M@bb}{"1D55D}
453   \DeclareMathSymbol{\M@bb@m}{\mathord}{\M@bb}{"1D55E}
454   \DeclareMathSymbol{\M@bb@n}{\mathord}{\M@bb}{"1D55F}
455   \DeclareMathSymbol{\M@bb@o}{\mathord}{\M@bb}{"1D560}
456   \DeclareMathSymbol{\M@bb@p}{\mathord}{\M@bb}{"1D561}
457   \DeclareMathSymbol{\M@bb@q}{\mathord}{\M@bb}{"1D562}
458   \DeclareMathSymbol{\M@bb@r}{\mathord}{\M@bb}{"1D563}

```

```

459 \DeclareMathSymbol{\M@bb@s}{\mathord}{\M@bb}{1D564}
460 \DeclareMathSymbol{\M@bb@t}{\mathord}{\M@bb}{1D565}
461 \DeclareMathSymbol{\M@bb@u}{\mathord}{\M@bb}{1D566}
462 \DeclareMathSymbol{\M@bb@v}{\mathord}{\M@bb}{1D567}
463 \DeclareMathSymbol{\M@bb@w}{\mathord}{\M@bb}{1D568}
464 \DeclareMathSymbol{\M@bb@x}{\mathord}{\M@bb}{1D569}
465 \DeclareMathSymbol{\M@bb@y}{\mathord}{\M@bb}{1D56A}
466 \DeclareMathSymbol{\M@bb@z}{\mathord}{\M@bb}{1D56B}
467 \expandafter\DeclareMathSymbol\expandafter
468   {\csname M@bb@0\endcsname}{\mathord}{\M@bb}{1D7D8}
469 \expandafter\DeclareMathSymbol\expandafter
470   {\csname M@bb@1\endcsname}{\mathord}{\M@bb}{1D7D9}
471 \expandafter\DeclareMathSymbol\expandafter
472   {\csname M@bb@2\endcsname}{\mathord}{\M@bb}{1D7DA}
473 \expandafter\DeclareMathSymbol\expandafter
474   {\csname M@bb@3\endcsname}{\mathord}{\M@bb}{1D7DB}
475 \expandafter\DeclareMathSymbol\expandafter
476   {\csname M@bb@4\endcsname}{\mathord}{\M@bb}{1D7DC}
477 \expandafter\DeclareMathSymbol\expandafter
478   {\csname M@bb@5\endcsname}{\mathord}{\M@bb}{1D7DD}
479 \expandafter\DeclareMathSymbol\expandafter
480   {\csname M@bb@6\endcsname}{\mathord}{\M@bb}{1D7DE}
481 \expandafter\DeclareMathSymbol\expandafter
482   {\csname M@bb@7\endcsname}{\mathord}{\M@bb}{1D7DF}
483 \expandafter\DeclareMathSymbol\expandafter
484   {\csname M@bb@8\endcsname}{\mathord}{\M@bb}{1D7E0}
485 \expandafter\DeclareMathSymbol\expandafter
486   {\csname M@bb@9\endcsname}{\mathord}{\M@bb}{1D7E1}}

```

Set caligraphic characters.

```

487 \def\M@cal@set{%
488   \edef\M@cal{M@calshape\the\M@count}
489   \DeclareMathSymbol{\M@cal@A}{\mathord}{\M@cal}{1D49C}
490   \DeclareMathSymbol{\M@cal@B}{\mathord}{\M@cal}{212C}
491   \DeclareMathSymbol{\M@cal@C}{\mathord}{\M@cal}{1D49E}
492   \DeclareMathSymbol{\M@cal@D}{\mathord}{\M@cal}{1D49F}
493   \DeclareMathSymbol{\M@cal@E}{\mathord}{\M@cal}{2130}
494   \DeclareMathSymbol{\M@cal@F}{\mathord}{\M@cal}{2131}
495   \DeclareMathSymbol{\M@cal@G}{\mathord}{\M@cal}{1D4A2}
496   \DeclareMathSymbol{\M@cal@H}{\mathord}{\M@cal}{210B}
497   \DeclareMathSymbol{\M@cal@I}{\mathord}{\M@cal}{2110}
498   \DeclareMathSymbol{\M@cal@J}{\mathord}{\M@cal}{1D4A5}
499   \DeclareMathSymbol{\M@cal@K}{\mathord}{\M@cal}{1D4A6}
500   \DeclareMathSymbol{\M@cal@L}{\mathord}{\M@cal}{2112}
501   \DeclareMathSymbol{\M@cal@M}{\mathord}{\M@cal}{2133}
502   \DeclareMathSymbol{\M@cal@N}{\mathord}{\M@cal}{1D4A9}
503   \DeclareMathSymbol{\M@cal@O}{\mathord}{\M@cal}{1D4AA}
504   \DeclareMathSymbol{\M@cal@P}{\mathord}{\M@cal}{1D4AB}

```

```

505 \DeclareMathSymbol{\M@cal@Q}{\mathord}{\M@cal}{1D4AC}
506 \DeclareMathSymbol{\M@cal@R}{\mathord}{\M@cal}{211B}
507 \DeclareMathSymbol{\M@cal@S}{\mathord}{\M@cal}{1D4AE}
508 \DeclareMathSymbol{\M@cal@T}{\mathord}{\M@cal}{1D4AF}
509 \DeclareMathSymbol{\M@cal@U}{\mathord}{\M@cal}{1D4B0}
510 \DeclareMathSymbol{\M@cal@V}{\mathord}{\M@cal}{1D4B1}
511 \DeclareMathSymbol{\M@cal@W}{\mathord}{\M@cal}{1D4B2}
512 \DeclareMathSymbol{\M@cal@X}{\mathord}{\M@cal}{1D4B3}
513 \DeclareMathSymbol{\M@cal@Y}{\mathord}{\M@cal}{1D4B4}
514 \DeclareMathSymbol{\M@cal@Z}{\mathord}{\M@cal}{1D4B5}
515 \DeclareMathSymbol{\M@cal@a}{\mathord}{\M@cal}{1D4B6}
516 \DeclareMathSymbol{\M@cal@b}{\mathord}{\M@cal}{1D4B7}
517 \DeclareMathSymbol{\M@cal@c}{\mathord}{\M@cal}{1D4B8}
518 \DeclareMathSymbol{\M@cal@d}{\mathord}{\M@cal}{1D4B9}
519 \DeclareMathSymbol{\M@cal@e}{\mathord}{\M@cal}{212F}
520 \DeclareMathSymbol{\M@cal@f}{\mathord}{\M@cal}{1D4BB}
521 \DeclareMathSymbol{\M@cal@g}{\mathord}{\M@cal}{210A}
522 \DeclareMathSymbol{\M@cal@h}{\mathord}{\M@cal}{1D4BD}
523 \DeclareMathSymbol{\M@cal@i}{\mathord}{\M@cal}{1D4BE}
524 \DeclareMathSymbol{\M@cal@j}{\mathord}{\M@cal}{1D4BF}
525 \DeclareMathSymbol{\M@cal@k}{\mathord}{\M@cal}{1D4C0}
526 \DeclareMathSymbol{\M@cal@l}{\mathord}{\M@cal}{1D4C1}
527 \DeclareMathSymbol{\M@cal@m}{\mathord}{\M@cal}{1D4C2}
528 \DeclareMathSymbol{\M@cal@n}{\mathord}{\M@cal}{1D4C3}
529 \DeclareMathSymbol{\M@cal@o}{\mathord}{\M@cal}{2134}
530 \DeclareMathSymbol{\M@cal@p}{\mathord}{\M@cal}{1D4C5}
531 \DeclareMathSymbol{\M@cal@q}{\mathord}{\M@cal}{1D4C6}
532 \DeclareMathSymbol{\M@cal@r}{\mathord}{\M@cal}{1D4C7}
533 \DeclareMathSymbol{\M@cal@s}{\mathord}{\M@cal}{1D4C8}
534 \DeclareMathSymbol{\M@cal@t}{\mathord}{\M@cal}{1D4C9}
535 \DeclareMathSymbol{\M@cal@u}{\mathord}{\M@cal}{1D4CA}
536 \DeclareMathSymbol{\M@cal@v}{\mathord}{\M@cal}{1D4CB}
537 \DeclareMathSymbol{\M@cal@w}{\mathord}{\M@cal}{1D4CC}
538 \DeclareMathSymbol{\M@cal@x}{\mathord}{\M@cal}{1D4CD}
539 \DeclareMathSymbol{\M@cal@y}{\mathord}{\M@cal}{1D4CE}
540 \DeclareMathSymbol{\M@cal@z}{\mathord}{\M@cal}{1D4CF}}

```

Set fraktur characters.

```

541 \def\M@frak@set{%
542   \edef\M@frak{M\M@frakshape\the\M@count}
543   \DeclareMathSymbol{\M@frak@A}{\mathord}{\M@frak}{1D504}
544   \DeclareMathSymbol{\M@frak@B}{\mathord}{\M@frak}{1D505}
545   \DeclareMathSymbol{\M@frak@C}{\mathord}{\M@frak}{212D}
546   \DeclareMathSymbol{\M@frak@D}{\mathord}{\M@frak}{1D507}
547   \DeclareMathSymbol{\M@frak@E}{\mathord}{\M@frak}{1D508}
548   \DeclareMathSymbol{\M@frak@F}{\mathord}{\M@frak}{1D509}
549   \DeclareMathSymbol{\M@frak@G}{\mathord}{\M@frak}{1D50A}
550   \DeclareMathSymbol{\M@frak@H}{\mathord}{\M@frak}{210C}

```

```

551 \DeclareMathSymbol{\M@frak@I}{\mathord}{\M@frak}{\boldsymbol{"2111}}
552 \DeclareMathSymbol{\M@frak@J}{\mathord}{\M@frak}{\boldsymbol{"1D50D}}
553 \DeclareMathSymbol{\M@frak@K}{\mathord}{\M@frak}{\boldsymbol{"1D50E}}
554 \DeclareMathSymbol{\M@frak@L}{\mathord}{\M@frak}{\boldsymbol{"1D50F}}
555 \DeclareMathSymbol{\M@frak@M}{\mathord}{\M@frak}{\boldsymbol{"1D510}}
556 \DeclareMathSymbol{\M@frak@N}{\mathord}{\M@frak}{\boldsymbol{"1D511}}
557 \DeclareMathSymbol{\M@frak@O}{\mathord}{\M@frak}{\boldsymbol{"1D512}}
558 \DeclareMathSymbol{\M@frak@P}{\mathord}{\M@frak}{\boldsymbol{"1D513}}
559 \DeclareMathSymbol{\M@frak@Q}{\mathord}{\M@frak}{\boldsymbol{"1D514}}
560 \DeclareMathSymbol{\M@frak@R}{\mathord}{\M@frak}{\boldsymbol{"212C}}
561 \DeclareMathSymbol{\M@frak@S}{\mathord}{\M@frak}{\boldsymbol{"1D516}}
562 \DeclareMathSymbol{\M@frak@T}{\mathord}{\M@frak}{\boldsymbol{"1D517}}
563 \DeclareMathSymbol{\M@frak@U}{\mathord}{\M@frak}{\boldsymbol{"1D518}}
564 \DeclareMathSymbol{\M@frak@V}{\mathord}{\M@frak}{\boldsymbol{"1D519}}
565 \DeclareMathSymbol{\M@frak@W}{\mathord}{\M@frak}{\boldsymbol{"1D51A}}
566 \DeclareMathSymbol{\M@frak@X}{\mathord}{\M@frak}{\boldsymbol{"1D51B}}
567 \DeclareMathSymbol{\M@frak@Y}{\mathord}{\M@frak}{\boldsymbol{"1D51C}}
568 \DeclareMathSymbol{\M@frak@Z}{\mathord}{\M@frak}{\boldsymbol{"2128}}
569 \DeclareMathSymbol{\M@frak@a}{\mathord}{\M@frak}{\boldsymbol{"1D51E}}
570 \DeclareMathSymbol{\M@frak@b}{\mathord}{\M@frak}{\boldsymbol{"1D51F}}
571 \DeclareMathSymbol{\M@frak@c}{\mathord}{\M@frak}{\boldsymbol{"1D520}}
572 \DeclareMathSymbol{\M@frak@d}{\mathord}{\M@frak}{\boldsymbol{"1D521}}
573 \DeclareMathSymbol{\M@frak@e}{\mathord}{\M@frak}{\boldsymbol{"1D522}}
574 \DeclareMathSymbol{\M@frak@f}{\mathord}{\M@frak}{\boldsymbol{"1D523}}
575 \DeclareMathSymbol{\M@frak@g}{\mathord}{\M@frak}{\boldsymbol{"1D524}}
576 \DeclareMathSymbol{\M@frak@h}{\mathord}{\M@frak}{\boldsymbol{"1D525}}
577 \DeclareMathSymbol{\M@frak@i}{\mathord}{\M@frak}{\boldsymbol{"1D526}}
578 \DeclareMathSymbol{\M@frak@j}{\mathord}{\M@frak}{\boldsymbol{"1D527}}
579 \DeclareMathSymbol{\M@frak@k}{\mathord}{\M@frak}{\boldsymbol{"1D528}}
580 \DeclareMathSymbol{\M@frak@l}{\mathord}{\M@frak}{\boldsymbol{"1D529}}
581 \DeclareMathSymbol{\M@frak@m}{\mathord}{\M@frak}{\boldsymbol{"1D52A}}
582 \DeclareMathSymbol{\M@frak@n}{\mathord}{\M@frak}{\boldsymbol{"1D52B}}
583 \DeclareMathSymbol{\M@frak@o}{\mathord}{\M@frak}{\boldsymbol{"1D52C}}
584 \DeclareMathSymbol{\M@frak@p}{\mathord}{\M@frak}{\boldsymbol{"1D52D}}
585 \DeclareMathSymbol{\M@frak@q}{\mathord}{\M@frak}{\boldsymbol{"1D52E}}
586 \DeclareMathSymbol{\M@frak@r}{\mathord}{\M@frak}{\boldsymbol{"1D52F}}
587 \DeclareMathSymbol{\M@frak@s}{\mathord}{\M@frak}{\boldsymbol{"1D530}}
588 \DeclareMathSymbol{\M@frak@t}{\mathord}{\M@frak}{\boldsymbol{"1D531}}
589 \DeclareMathSymbol{\M@frak@u}{\mathord}{\M@frak}{\boldsymbol{"1D532}}
590 \DeclareMathSymbol{\M@frak@v}{\mathord}{\M@frak}{\boldsymbol{"1D533}}
591 \DeclareMathSymbol{\M@frak@w}{\mathord}{\M@frak}{\boldsymbol{"1D534}}
592 \DeclareMathSymbol{\M@frak@x}{\mathord}{\M@frak}{\boldsymbol{"1D535}}
593 \DeclareMathSymbol{\M@frak@y}{\mathord}{\M@frak}{\boldsymbol{"1D536}}
594 \DeclareMathSymbol{\M@frak@z}{\mathord}{\M@frak}{\boldsymbol{"1D537}}

```

Set bold caligraphic characters.

```

595 \def\M@bcal@set{%
596   \edef\M@bcal{\M@bcalshape\the\M@count}

```

```

597 \DeclareMathSymbol{\M@bcal@A}{\mathord}{\M@bcal}{1D4D0}
598 \DeclareMathSymbol{\M@bcal@B}{\mathord}{\M@bcal}{1D4D1}
599 \DeclareMathSymbol{\M@bcal@C}{\mathord}{\M@bcal}{1D4D2}
600 \DeclareMathSymbol{\M@bcal@D}{\mathord}{\M@bcal}{1D4D3}
601 \DeclareMathSymbol{\M@bcal@E}{\mathord}{\M@bcal}{1D4D4}
602 \DeclareMathSymbol{\M@bcal@F}{\mathord}{\M@bcal}{1D4D5}
603 \DeclareMathSymbol{\M@bcal@G}{\mathord}{\M@bcal}{1D4D6}
604 \DeclareMathSymbol{\M@bcal@H}{\mathord}{\M@bcal}{1D4D7}
605 \DeclareMathSymbol{\M@bcal@I}{\mathord}{\M@bcal}{1D4D8}
606 \DeclareMathSymbol{\M@bcal@J}{\mathord}{\M@bcal}{1D4D9}
607 \DeclareMathSymbol{\M@bcal@K}{\mathord}{\M@bcal}{1D4DA}
608 \DeclareMathSymbol{\M@bcal@L}{\mathord}{\M@bcal}{1D4DB}
609 \DeclareMathSymbol{\M@bcal@M}{\mathord}{\M@bcal}{1D4DC}
610 \DeclareMathSymbol{\M@bcal@N}{\mathord}{\M@bcal}{1D4DD}
611 \DeclareMathSymbol{\M@bcal@O}{\mathord}{\M@bcal}{1D4DE}
612 \DeclareMathSymbol{\M@bcal@P}{\mathord}{\M@bcal}{1D4DF}
613 \DeclareMathSymbol{\M@bcal@Q}{\mathord}{\M@bcal}{1D4E0}
614 \DeclareMathSymbol{\M@bcal@R}{\mathord}{\M@bcal}{1D4E1}
615 \DeclareMathSymbol{\M@bcal@S}{\mathord}{\M@bcal}{1D4E2}
616 \DeclareMathSymbol{\M@bcal@T}{\mathord}{\M@bcal}{1D4E3}
617 \DeclareMathSymbol{\M@bcal@U}{\mathord}{\M@bcal}{1D4E4}
618 \DeclareMathSymbol{\M@bcal@V}{\mathord}{\M@bcal}{1D4E5}
619 \DeclareMathSymbol{\M@bcal@W}{\mathord}{\M@bcal}{1D4E6}
620 \DeclareMathSymbol{\M@bcal@X}{\mathord}{\M@bcal}{1D4E7}
621 \DeclareMathSymbol{\M@bcal@Y}{\mathord}{\M@bcal}{1D4E8}
622 \DeclareMathSymbol{\M@bcal@Z}{\mathord}{\M@bcal}{1D4E9}
623 \DeclareMathSymbol{\M@bcal@a}{\mathord}{\M@bcal}{1D4EA}
624 \DeclareMathSymbol{\M@bcal@b}{\mathord}{\M@bcal}{1D4EB}
625 \DeclareMathSymbol{\M@bcal@c}{\mathord}{\M@bcal}{1D4EC}
626 \DeclareMathSymbol{\M@bcal@d}{\mathord}{\M@bcal}{1D4ED}
627 \DeclareMathSymbol{\M@bcal@e}{\mathord}{\M@bcal}{1D4EE}
628 \DeclareMathSymbol{\M@bcal@f}{\mathord}{\M@bcal}{1D4EF}
629 \DeclareMathSymbol{\M@bcal@g}{\mathord}{\M@bcal}{1D4F0}
630 \DeclareMathSymbol{\M@bcal@h}{\mathord}{\M@bcal}{1D4F1}
631 \DeclareMathSymbol{\M@bcal@i}{\mathord}{\M@bcal}{1D4F2}
632 \DeclareMathSymbol{\M@bcal@j}{\mathord}{\M@bcal}{1D4F3}
633 \DeclareMathSymbol{\M@bcal@k}{\mathord}{\M@bcal}{1D4F4}
634 \DeclareMathSymbol{\M@bcal@l}{\mathord}{\M@bcal}{1D4F5}
635 \DeclareMathSymbol{\M@bcal@m}{\mathord}{\M@bcal}{1D4F6}
636 \DeclareMathSymbol{\M@bcal@n}{\mathord}{\M@bcal}{1D4F7}
637 \DeclareMathSymbol{\M@bcal@o}{\mathord}{\M@bcal}{1D4F8}
638 \DeclareMathSymbol{\M@bcal@p}{\mathord}{\M@bcal}{1D4F9}
639 \DeclareMathSymbol{\M@bcal@q}{\mathord}{\M@bcal}{1D4FA}
640 \DeclareMathSymbol{\M@bcal@r}{\mathord}{\M@bcal}{1D4FB}
641 \DeclareMathSymbol{\M@bcal@s}{\mathord}{\M@bcal}{1D4FC}
642 \DeclareMathSymbol{\M@bcal@t}{\mathord}{\M@bcal}{1D4FD}
643 \DeclareMathSymbol{\M@bcal@u}{\mathord}{\M@bcal}{1D4FE}

```



```

644 \DeclareMathSymbol{\M@bcal@v}{\mathord}{\M@bcal}{1D4FF}
645 \DeclareMathSymbol{\M@bcal@w}{\mathord}{\M@bcal}{1D500}
646 \DeclareMathSymbol{\M@bcal@x}{\mathord}{\M@bcal}{1D501}
647 \DeclareMathSymbol{\M@bcal@y}{\mathord}{\M@bcal}{1D502}
648 \DeclareMathSymbol{\M@bcal@z}{\mathord}{\M@bcal}{1D503}

```

Set bold fraktur characters.

```

649 \def\M@bfrak@set{%
650 \edef\M@bfrak{M@bfrakshape\the\M@count}
651 \DeclareMathSymbol{\M@bfrak@A}{\mathord}{\M@bfrak}{1D56C}
652 \DeclareMathSymbol{\M@bfrak@B}{\mathord}{\M@bfrak}{1D56D}
653 \DeclareMathSymbol{\M@bfrak@C}{\mathord}{\M@bfrak}{1D56E}
654 \DeclareMathSymbol{\M@bfrak@D}{\mathord}{\M@bfrak}{1D56F}
655 \DeclareMathSymbol{\M@bfrak@E}{\mathord}{\M@bfrak}{1D570}
656 \DeclareMathSymbol{\M@bfrak@F}{\mathord}{\M@bfrak}{1D571}
657 \DeclareMathSymbol{\M@bfrak@G}{\mathord}{\M@bfrak}{1D572}
658 \DeclareMathSymbol{\M@bfrak@H}{\mathord}{\M@bfrak}{1D573}
659 \DeclareMathSymbol{\M@bfrak@I}{\mathord}{\M@bfrak}{1D574}
660 \DeclareMathSymbol{\M@bfrak@J}{\mathord}{\M@bfrak}{1D575}
661 \DeclareMathSymbol{\M@bfrak@K}{\mathord}{\M@bfrak}{1D576}
662 \DeclareMathSymbol{\M@bfrak@L}{\mathord}{\M@bfrak}{1D577}
663 \DeclareMathSymbol{\M@bfrak@M}{\mathord}{\M@bfrak}{1D578}
664 \DeclareMathSymbol{\M@bfrak@N}{\mathord}{\M@bfrak}{1D579}
665 \DeclareMathSymbol{\M@bfrak@O}{\mathord}{\M@bfrak}{1D57A}
666 \DeclareMathSymbol{\M@bfrak@P}{\mathord}{\M@bfrak}{1D57B}
667 \DeclareMathSymbol{\M@bfrak@Q}{\mathord}{\M@bfrak}{1D57C}
668 \DeclareMathSymbol{\M@bfrak@R}{\mathord}{\M@bfrak}{1D57D}
669 \DeclareMathSymbol{\M@bfrak@S}{\mathord}{\M@bfrak}{1D57E}
670 \DeclareMathSymbol{\M@bfrak@T}{\mathord}{\M@bfrak}{1D57F}
671 \DeclareMathSymbol{\M@bfrak@U}{\mathord}{\M@bfrak}{1D580}
672 \DeclareMathSymbol{\M@bfrak@V}{\mathord}{\M@bfrak}{1D581}
673 \DeclareMathSymbol{\M@bfrak@W}{\mathord}{\M@bfrak}{1D582}
674 \DeclareMathSymbol{\M@bfrak@X}{\mathord}{\M@bfrak}{1D583}
675 \DeclareMathSymbol{\M@bfrak@Y}{\mathord}{\M@bfrak}{1D584}
676 \DeclareMathSymbol{\M@bfrak@Z}{\mathord}{\M@bfrak}{1D585}
677 \DeclareMathSymbol{\M@bfrak@a}{\mathord}{\M@bfrak}{1D586}
678 \DeclareMathSymbol{\M@bfrak@b}{\mathord}{\M@bfrak}{1D587}
679 \DeclareMathSymbol{\M@bfrak@c}{\mathord}{\M@bfrak}{1D588}
680 \DeclareMathSymbol{\M@bfrak@d}{\mathord}{\M@bfrak}{1D589}
681 \DeclareMathSymbol{\M@bfrak@e}{\mathord}{\M@bfrak}{1D58A}
682 \DeclareMathSymbol{\M@bfrak@f}{\mathord}{\M@bfrak}{1D58B}
683 \DeclareMathSymbol{\M@bfrak@g}{\mathord}{\M@bfrak}{1D58C}
684 \DeclareMathSymbol{\M@bfrak@h}{\mathord}{\M@bfrak}{1D58D}
685 \DeclareMathSymbol{\M@bfrak@i}{\mathord}{\M@bfrak}{1D58E}
686 \DeclareMathSymbol{\M@bfrak@j}{\mathord}{\M@bfrak}{1D58F}
687 \DeclareMathSymbol{\M@bfrak@k}{\mathord}{\M@bfrak}{1D590}
688 \DeclareMathSymbol{\M@bfrak@l}{\mathord}{\M@bfrak}{1D591}
689 \DeclareMathSymbol{\M@bfrak@m}{\mathord}{\M@bfrak}{1D592}

```

```

690 \DeclareMathSymbol{\M@bfrak@n}{\mathord}{\M@bfrak}{1D593}
691 \DeclareMathSymbol{\M@bfrak@o}{\mathord}{\M@bfrak}{1D594}
692 \DeclareMathSymbol{\M@bfrak@p}{\mathord}{\M@bfrak}{1D595}
693 \DeclareMathSymbol{\M@bfrak@q}{\mathord}{\M@bfrak}{1D596}
694 \DeclareMathSymbol{\M@bfrak@r}{\mathord}{\M@bfrak}{1D597}
695 \DeclareMathSymbol{\M@bfrak@s}{\mathord}{\M@bfrak}{1D598}
696 \DeclareMathSymbol{\M@bfrak@t}{\mathord}{\M@bfrak}{1D599}
697 \DeclareMathSymbol{\M@bfrak@u}{\mathord}{\M@bfrak}{1D59A}
698 \DeclareMathSymbol{\M@bfrak@v}{\mathord}{\M@bfrak}{1D59B}
699 \DeclareMathSymbol{\M@bfrak@w}{\mathord}{\M@bfrak}{1D59C}
700 \DeclareMathSymbol{\M@bfrak@x}{\mathord}{\M@bfrak}{1D59D}
701 \DeclareMathSymbol{\M@bfrak@y}{\mathord}{\M@bfrak}{1D59E}
702 \DeclareMathSymbol{\M@bfrak@z}{\mathord}{\M@bfrak}{1D59F}

```

Provide the command to reset macros and conclude.

```

703 \def\restoremathinternals{%
704   \M@RestoreInternalsInfo
705   \let\set@mathchar\@@set@mathchar
706   \let\set@mathsymbol\@@set@mathsymbol}

```

Unless the user specified the `packages` option, `mathfont` will reset the internal math symbol commands when the user loads another package.

```

707 \if@packages
708 \else
709   \let\@@usepackage\usepackage
710   \def\usepackage{\restoremathinternals
711     \let\usepackage\@@usepackage
712     \usepackage}
713 \fi

```

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