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 XeLaTeX or LuaLaTeX:

```
\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 XeLaTeX and LuaLaTeX, 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 LaTeX 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.

```
\NeedsTeXFormat{LaTeX2e}
\ProvidesPackage{mathfont}[2019/12/05 v. 1.6 Package mathfont]
\newif\ifM@font@loaded
\newif\ifM@special\M@specialtrue
\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.

```
\def\@gobbletwo@brackets[#1]#2{}
\def\M@NoMathfontError#1{\PackageError{mathfont}
  {\MessageBreak Invalid command\MessageBreak
  \string#1 on line \the\inputlineno}
  {Your command was ignored. I couldn't\MessageBreak
  load mathfont successfully, so this\MessageBreak
  control sequence was never defined.}}
\def\mathfont{\M@NoMathfontError\mathfont
  \@ifnextchar[\@gobbletwo@brackets\@gobble}
\def\setfont{\M@NoMathfontError\setfont\@gobble}
\def\newmathrm{\M@NoMathfontError\newmathrm\@gobbletwo}
\def\newmathit{\M@NoMathfontError\newmathit\@gobbletwo}
\def\newmathbf{\M@NoMathfontError\newmathbf\@gobbletwo}
\def\newmathbfit{\M@NoMathfontError\newmathbf\@gobbletwo}
\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 `\endgroup`s. 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.

```
\begingroup
\catcode`\+=\active
\def+{ }
\def\M@NoFontspecError{\GenericError{}
  {\MessageBreak\MessageBreak
  Package mathfont fatal error:
  \MessageBreak\MessageBreak
  +**********************\MessageBreak
  +**********************\MessageBreak
  +***!!FATAL ERROR!!***\MessageBreak
  +**********************\MessageBreak
  +******Could not******\MessageBreak
  +****find+fontspec****\MessageBreak
  +**********************\MessageBreak
  +**********************\MessageBreak\@gobbletwo}
  {See the mathfont package documentation for explanation.}
```

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

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

```
\begingroup
\catcode`\+=\active
\def+{ }
\def\M@XeTeXLuaTeXError{\GenericError{}
  {\MessageBreak\MessageBreak
  Package mathfont fatal error:
  \MessageBreak\MessageBreak
  +++++++++++++++++++++\MessageBreak
  +++++++++++++++++++++\MessageBreak
  +++!!FATAL ERROR!!+++\MessageBreak
  +++++++++++++++++++++\MessageBreak
  +++++Missing XeTeX++++\MessageBreak
  +++++++or LuaTeX++++++\MessageBreak
  +++++++++++++++++++++\MessageBreak
  +++++++++++++++++++++\MessageBreak\@gobbletwo}
  {See the mathfont package documentation for explanation.}
  {I need XeTeX or LuaTeX to make this\MessageBreak
  package work properly. It looks like the\MessageBreak
  current engine is something else, so I'm\MessageBreak
  going to stop reading in the package file\MessageBreak
  now. (You won't be able to use commands\MessageBreak
  from mathfont in your document.) To make\MessageBreak
  mathfont work correctly, please retypeset\MessageBreak
  this file with one of those two engines.}}
```

Check that the engine has defined the necessary primitives.

```
\ifx\Umathcode\@undefined
\else
  \ifx\Umathchardef\@undefined
  \else
    \ifx\Umathaccent\@undefined
    \else
      \M@XeTeXLuaTeXtrue
    \fi
  \fi
```

```
\fi
\ifM@XeTeXLuaTeX
  \endgroup
\else
  \M@XeTeXLuaTeXError\endgroup
  \AtEndOfPackage{\typeout{Package mathfont failed to load\on@line}}
  \expandafter\endinput% we should \endinput with a balanced conditional
\fi
```

Some package options are now depreciated.

```
\def\M@OptionDepreciated#1#2{\PackageError{mathfont}
  {Option "#1" depreciated}
  {Your option was ignored. Please\MessageBreak
  use #2\MessageBreak
  instead. For more information,\MessageBreak
  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`.

```
\IfFileExists{atveryend.sty}
  {\RequirePackage{atveryend}\let\M@SpecialHook\AtVeryVeryEnd}
  {\let\M@SpecialHook\AtEndDocument}
\DeclareOption{packages}{\M@OptionDepreciated{packages}
  {\string\restoremathinternals}}
\DeclareOption{operators}{\M@OptionDepreciated{operators}
  {the bigops keyword with \string\mathfont}}
\DeclareOption{no-operators}{\M@OptionDepreciated{no-operators}
  {the bigops keyword with \string\mathfont}}
\DeclareOption{easter-egg}{\ifM@special\M@specialfalse
  \def\EasterEggUpdate{\show\E@sterEggUpdate}
  \def\E@sterEggUpdate{Okay, opening your Easter egg}
    \EasterEggUpdate
  \def\E@sterEggUpdate{..}
    \EasterEggUpdate
    \EasterEggUpdate
  \typeout{^^JHm, I think it flew out the^^J%
    window. Check back here when^^J%
    everything's done compiling^^J}
  \def\E@sterEggUpdate{Uh oh}
    \EasterEggUpdate
  \def\E@sterEggUpdate{Still wrangling. Try back later}
  \AtBeginDocument\EasterEggUpdate
  \M@SpecialHook{%
    \typeout{^^JHappy, happy day! Happy,^^J%
    happy day! Clap your hands,^^J%
    and be glad your hovercraft^^J%
    isn't full of eels!^^J}
    \def\E@sterEggUpdate{Got it}
```

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

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

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

2 Errors and Messaging

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

```
\def\M@FontChangeInfo#1#2{\wlog{Package mathfont Info:
  Changing #1 characters to #2!}}
\def\M@CommandInitializeInfo#1{\wlog{Package mathfont Info: Initializing
  \noexpand#1 font-change command on line \the\inputlineno.}}
\def\M@NewFontCommandInfo#1#2#3#4{\wlog{Package mathfont Info: Creating
  math alphabet command \noexpand#1 using^^J%
  #2 font with series #3 and shape #4 on line \the\inputlineno.}}
\def\M@SetInternalsInfo{\wlog{Package mathfont Info: Setting
  \string\set@mathchar, \string\set@mathsymbol, \string\set@mathaccent.}}
\def\M@RestoreInternalsInfo{\wlog{Package mathfont Info: Fixing
  \string\set@mathchar, \string\set@mathsymbol, \string\set@mathaccent.}}
\def\M@CharsSetWarning#1{\PackageWarning{mathfont}
  {Font for #1 chars has already\MessageBreak
  been set, so I'm ignoring this\MessageBreak
  keyword}}
```

Warnings for the \mathbb, etc. commands.

```
\def\M@DoubleArgWarning#1#2{\PackageWarning{mathfont}
  {I'm ignoring the multiple characters\MessageBreak
  "#1" that are grouped together in\MessageBreak
  the argument of your \expandafter\string#2\space command\MessageBreak}}
\def\M@NestedArgWarning#1#2{\PackageWarning{mathfont}
  {I'm ignoring the nested argument\MessageBreak
  "#1" from your \expandafter\string#2\MessageBreak
  command}}
\def\M@ControlSequenceArgWarning#1#2{\PackageWarning{mathfont}
  {I'm ignoring the unexpandable control\MessageBreak
  sequence \expandafter\string#1\space that appears in the\MessageBreak
  argument of your \expandafter\string#2\space command\MessageBreak}}
\def\M@CharacterArgWarning#1#2{\PackageWarning{mathfont}
  {I'm ignoring the "#1" in the\MessageBreak
  argument of your \expandafter\string#2\MessageBreak
  command because it isn't a\MessageBreak
  letter or digit}}
```

Warning for depreciated commands.

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

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

Error message from loading fontspec without `no-math`.

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

Error messages associated with `\mathfont`.

```
\def\M@InvalidOptionError#1{\PackageError{mathfont}
  {Invalid option "#1"\MessageBreak
  for \string\mathfont\on@line}
  {Hm. Check that you spelled the\MessageBreak
  option correctly. Otherwise, I'm\MessageBreak
  not sure what's wrong. Is this\MessageBreak
  option listed in the package\MessageBreak
  documentation? In any event, I'm\MessageBreak
  going to ignore this option.}}
\def\M@InvalidSuboptionError#1{\PackageError{mathfont}
  {Invalid suboption "#1"\MessageBreak
  for \string\mathfont\on@line}
  {Hm. Check that you spelled the\MessageBreak
  suboption correctly. Otherwise, I'm\MessageBreak
  not sure what's wrong. Is this\MessageBreak
  suboption listed in the package\MessageBreak
  documentation? In any event, I'm\MessageBreak
  going to ignore this suboption.}}
\def\M@MissingOptionError{\PackageError{mathfont}
  {Missing option for\MessageBreak
  \string\mathfont\on@line}
  {It looks like you included a , or = in\MessageBreak
  the optional argument of \string\mathfont\MessageBreak
  but didn't put anything before it.}}
\def\M@MissingSuboptionError{\PackageError{mathfont}
  {Missing suboption for\MessageBreak
  \string\mathfont\on@line}
  {It looks like you included an = somewhere\MessageBreak
  but didn't put the suboption after it. Either\MessageBreak
  that or you typed == instead of = in the\MessageBreak
  optional argument of \string\mathfont.}}
\def\M@InternalsRestoredError{\PackageError{mathfont}
```

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

Error messages for the `\newmathrm`, etc. commands.

```
\def\M@MissingControlSequenceError#1#2{\PackageError{mathfont}
  {Missing control sequence\MessageBreak
  for\string#1\MessageBreak on input line \the\inputlineno}
  {Your command was ignored. Right now the\MessageBreak
  first argument of \string#1\space is "#2."\MessageBreak
  Please use a control sequence instead.}}
\def\M@DoubleArgError#1#2{\PackageError{mathfont}
  {Multiple characters in\MessageBreak
  first argument of \string#2\MessageBreak
  on input line \the\inputlineno}
  {Your command was ignored. Right now the\MessageBreak
  first argument of \string#2\space is "#1,"\MessageBreak
  which is multiple characters. Please use\MessageBreak
  a single character instead.}}
\def\M@HModeError#1{\PackageError{mathfont}
  {Missing \$ inserted. The\MessageBreak
  command \string#1\space must be used in\MessageBreak
  math mode\on@line}
  {I generated an error because\MessageBreak
  you used \string#1\space outside of\MessageBreak
  math mode. I've inserted a \string$\MessageBreak
  just before your \string#1, so\MessageBreak
  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 `\@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.

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

```
    \M@NoMathError
  \fi}{\RequirePackage[no-math]{fontspec}}
\expandafter\let\expandafter\@newfont
  \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.

```
\M@SetInternalsInfo
\let\@@set@mathchar\set@mathchar
\let\@@set@mathsymbol\set@mathsymbol
\let\@@set@mathaccent\set@mathaccent
```

Kernel command to set math characters from keystrokes.

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

Kernel command to set math characters from control sequences.

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

Kernel command to set accents.

```
\def\set@mathaccent#1#2#3#4{%
  \multiply\count\z@ by 16\relax
  \advance\count\z@\count\tw@
  \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`.

```
\newcount\M@count
\newcount\M@return
\M@count\z@
\newtoks\M@toks
```

We create necessary booleans and the default math font shapes.

```
\newif\if@upper
\newif\if@lower
\newif\if@diacritics
\newif\if@greekupper
\newif\if@greeklower
\newif\if@agreekupper
\newif\if@agreeklower
\newif\if@cyrillicupper
\newif\if@cyrilliclower
```

```
\newif\if@hebrew
\newif\if@digits
\newif\if@operator
\newif\if@symbols
\newif\if@extsymbols
\newif\if@delimiters
\newif\if@arrows
\newif\if@bigops
\newif\if@extbigops
\newif\if@bb
\newif\if@cal
\newif\if@frak
\newif\if@bcal
\newif\if@bfrak
\newif\if@optionpresent
\newif\if@suboptionpresent
\newif\ifM@mathfont@firstoption
\newif\ifM@anychars@changed
\newif\ifM@arg@good
\def\@uppershape{italic}% latin upper
\def\@lowershape{italic}% latin lower
\def\@diacriticsshape{roman}% diacritics
\def\@greekuppershape{roman}% greek upper
\def\@greeklowershape{italic}% greek lower
\def\@agreekuppershape{roman}% ancient greek upper
\def\@agreeklowershape{italic}% ancient greek lower
\def\@cyrillicuppershape{roman}% cyrillic upper
\def\@cyrilliclowershape{italic}% cyrillic lower
\def\@hebrewshape{roman}% hebrew
\def\@digitsshape{roman}% numerals
\def\@operatorshape{roman}% operator font
\def\@symbolsshape{roman}% basic symbols
\def\@extsymbolsshape{roman}% extended symbols
\def\@delimitersshape{roman}% delimiters
\def\@arrowsshape{roman}% arrows
\def\@bigopsshape{roman}% big operators
\def\@extbigopsshape{roman}% extended big operators
\def\@bbshape{roman}% blackboard bold
\def\@calshape{roman}% caligraphic
\def\@frakshape{roman}% fraktur
\def\@bcalshape{roman}% bold caligraphic
\def\@bfrakshape{roman}% bold fraktur
\def\@defaultkeys{upper,lower,diacritics,greekupper,greeklower,%
  digits,symbols,operator}
\def\@normalkeys{upper,lower,diacritics,greekupper,greeklower,agreekupper,%
  agreeklower,cyrillicupper,cyrilliclower,hebrew,digits,operator,symbols,%
  extsymbols,delimiters,arrows,bigops,extbigops}
```

```
\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.

```
\def\M@check@option@valid#1{%
  \def\@temperror{\M@InvalidOptionError{#1}}
  \@for\@j:=\@normalkeys\do{%
    \ifx\@j#1
      \let\@temperror\relax
      \@optionpresenttrue% set switch to true if option is valid
      \advance\M@return\@ne
    \fi}
```

We have to initialize alphanumeric symbols separately.

```
  \@for\@j:=\@alphanumkeys\do{%
    \ifx\@j#1
      \let\@temperror\relax
      \expandafter\M@CommandInitializeInfo\csname math\@j\endcsname
      \csname define@\@j\endcsname% initialize
      \@optionpresenttrue% set switch to true if option is valid
      \advance\M@return\@ne
    \fi}
  \@temperror}
```

Do the same thing for the suboption.

```
\def\M@check@suboption@valid#1{%
  \def\@temperror{\M@InvalidSuboptionError{#1}}
  \@for\@j:=roman,italic\do{%
    \ifx\@j#1
      \let\@temperror\relax
      \@suboptionpresenttrue% set switch to true if suboption is valid
      \advance\M@return\@ne
    \fi}
  \@temperror}
```

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.

```
\def\M@strip@equals#1={#1}
\def\M@parse@option#1=#2\@nil{%
  \@optionpresentfalse% set switch to false by default
  \@suboptionpresentfalse% set switch to false by default
  \def\@tempa{#1}
  \def\@tempb{#2}
  \ifx\@tempa\@empty
    \M@MissingOptionError
  \else
    \M@check@option@valid\@tempa
    \def\@tempc{=}
    \ifx\@tempb\@tempc
      \M@MissingSuboptionError
    \else
      \ifx\@tempb\@empty
      \else
        \edef\@tempb{\expandafter\M@strip@equals\@tempb}
        \M@check@suboption@valid\@tempb
      \fi
    \fi
  \fi}
```

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

```
\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.

```
\def\M@check@arglength#1#2\@nil#3#4{%
  \ifx\@nnil#2\@nnil
  \else
    #3{#1#2}{#4}%
    \M@arg@goodfalse
  \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`.

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

The internal default-font-changing command.

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

```
    \M@InternalsRestoredError
```

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

```
  \else
    \M@return\thr@@
    \M@toks{}
    \M@mathfont@firstoptiontrue
```

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

```
    \wlog{Package mathfont Info: Loading font #2 with package fontspec.}
    \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 `\edef`s 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.

```
    \edef\@tempa{#1}
    \edef\@tempa{\M@eat@spaces\@tempa}
    \@for\@i:=\@tempa\do{\expandafter\M@parse@option\@i=\@nil
      \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!)

```
        \expandafter\ifx% next line is two cs to be compared
             \csname if@\@tempa\expandafter\endcsname\csname iftrue\endcsname
          \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.

```
        \else
          \ifM@mathfont@firstoption
            \M@mathfont@firstoptionfalse
          \else
            \ifnum\M@return>5\relax
              \expandafter\M@toks\expandafter{\the\M@toks,^^J}
              \M@return\z@
            \else
              \expandafter\M@toks\expandafter{\the\M@toks, }
            \fi
          \fi
```

Add the keyword-option to the toks.

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

Handle the case with a suboption.

```
412          \if@suboptionpresent
413            \expandafter\edef\csname @\@tempa shape\endcsname{\@tempb}
414            \edef\@tempc{\the\M@toks\space(\@tempb)}
415            \expandafter\M@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\M@count}
420              {\DeclareSymbolFont{Mroman\the\M@count}{TU}
421                {\csname M@font\the\M@count\endcsname}{m}{n}}{}
422          \fi
423          \def\@tempb{italic}
424          \expandafter\ifx\csname @\@tempa shape\endcsname\@tempb
425            \@ifundefined{symMitalic\the\M@count}
426              {\DeclareSymbolFont{Mitalic\the\M@count}{TU}
427                {\csname M@font\the\M@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\M@count\@ne
437    \edef\@tempa{\the\M@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\M@toks.^^J}
445    \fi
446  \fi}
447 \@onlypreamble\mathfont
448 \@onlypreamble\m@thf@nt
449 \@onlypreamble\@mathfont
```

We end the section by coding `\setfont`.

```
\def\setfont#1{\setmainfont[Ligatures=TeX]{#1}\mathfont{#1}}
\@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.

```
\def\M@check@mode#1{%
  \let\@tempa#1%
  \ifmmode
    \expandafter\@tempa
  \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.

```
    \bgroup
      \escapechar\m@ne
      \expandafter
    \egroup
    \expandafter\M@HModeError\csname\expandafter\@gobble\string#1\endcsname
    \leavevmode\expandafter$\expandafter\@tempa
  \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.

```
\def\M@process@tokens#1#2{%
  \edef\@tempa{#1}%
  \expandafter\@tfor\expandafter\@k\expandafter:\expandafter=\@tempa\do{%
  \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.

```
  \ifM@arg@good
    \csname M@#2@\@k\endcsname
  \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.

```
\def\M@check@token#1#2{%
  \M@arg@goodtrue
  \M@check@arglength#1\@nil\M@DoubleArgWarning{\csname math#2\endcsname}%
  \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.

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

Check whether #1 is a control sequence.

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

Check that #1 is a letter.

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

Finally, check that #1 is a digit.

```
          \if 0#1% good
          \else
            \if 1#1% good
            \else
              \if 2#1% good
              \else
                \if 3#1% good
                \else
                  \if 4#1% good
                  \else
                    \if 5#1% good
                    \else
                      \if 6#1% good
                      \else
```

```
                        \if 7#1% good
                        \else
                          \if 8#1% good
                          \else
                            \if 9#1% good
                            \else
```

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

```
                              \M@CharacterArgWarning
                                {#1}{\csname math#2\endcsname}%
                              \M@arg@goodfalse
                            \fi
                          \fi
                        \fi
                      \fi
                    \fi
                  \fi
                \fi
              \fi
            \fi
          \fi
        \fi
      \fi
    \fi
  \fi}
```

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

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

Calligraphic characters.

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

Fraktur characters.

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

Bold calligraphic characters.

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

Bold fraktur characters.

```
\def\define@bfrak{%
  \def\mathbfrak{\M@check@mode\@mathbfrak}%
  \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.

```
\def\M@check@csarg#1#2#3{%
  \M@arg@goodtrue
  \M@check@arglength#2\@nil\M@DoubleArgError{#1}
  \ifM@arg@good% good
    \ifcat\relax\noexpand#2% good
    \else
      \M@MissingControlSequenceError{#1}{#2}
      \M@arg@goodfalse
    \fi
  \fi
  \ifM@arg@good
    \def\@tempa{#2}
    \wlog{Package mathfont Info: Loading font #3 with package fontspec.}
    \@newfont\@tempb{}{#3}
    \expandafter\@newmathfontcommand
  \else
    \expandafter\@gobbletwo
  \fi}
\@onlypreamble\M@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.

```
\def\@newmathfontcommand#1#2{%
  \expandafter\M@NewFontCommandInfo\expandafter
    {\@tempa}{\@tempb}{#1}{#2}
  \expandafter\DeclareMathAlphabet\expandafter
    {\@tempa}{TU}{\@tempb}{#1}{#2}}
\def\newmathfontcommand{\M@check@csarg\newmathfontcommand}
\@onlypreamble\@newmathfontcommand
\@onlypreamble\newmathfontcommand
```

Then provide the four default versions.

```
\def\newmathrm#1#2{\M@check@csarg\newmathrm{#1}{#2}
  {\mddefault}{\updefault}}
\def\newmathit#1#2{\M@check@csarg\newmathit{#1}{#2}
  {\mddefault}{\itdefault}}
```

```
\def\newmathbf#1#2{\M@check@csarg\newmathbf{#1}{#2}
  {\bfdefault}{\updefault}}
\def\newmathbfit#1#2{\M@check@csarg\newmathbfit{#1}{#2}
  {\bfdefault}{\itdefault}}
\@onlypreamble\newmathrm
\@onlypreamble\newmathit
\@onlypreamble\newmathbf
\@onlypreamble\newmathbfit
```

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

```
\def\newmathbold{%
  \M@DepreciatedWarning\newmathbold\newmathbf
  \newmathbf}
\def\newmathboldit{%
  \M@DepreciatedWarning\newmathboldit\newmathbfit
  \newmathbfit}
```

8 Concluding Material

Provide the command to reset macros.

```
\def\restoremathinternals{%
  \ifx\set@mathchar\@@set@mathchar
  \else
    \M@RestoreInternalsInfo
  \fi
  \let\set@mathchar\@@set@mathchar
  \let\set@mathsymbol\@@set@mathsymbol
  \let\set@mathaccent\@@set@mathaccent}
```

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

```
\def\keyword@info@begindocument#1{%
  \expandafter\ifx% next line is two cs to be compared
        \csname if@#1\expandafter\endcsname\csname iftrue\endcsname
    \wlog{Keyword #1: Set to \csname M@#1@fontinfo\endcsname\space with
      \csname @#1shape\endcsname\space shape.}
  \else
    \wlog{Keyword #1: No change.}
  \fi}
\AtBeginDocument{%
  \ifM@anychars@changed
    \edef\@tempa{\@normalkeys,\@alphanumkeys}
    \wlog{^^J:: mathfont :: List of fonts changed by mathfont:}
    \@for\@i:=\@tempa\do{%
      \expandafter\keyword@info@begindocument\expandafter{\@i}}
    \wlog{}
  \else
```

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

```
\tracinglostchars=1
```

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

```
\ifx\XeTeXrevision\@undefined
\else
  \ifM@font@loaded
    \AtEndOfPackage{%
    \PackageWarningNoLine{mathfont}
    {XeTeX detected. It looks like you\MessageBreak
    specified a font when you loaded\MessageBreak
    mathfont. If you run into problems\MessageBreak
    with a font whose name is multiple\MessageBreak
    words, try compiling with LuaLaTeX\MessageBreak
    instead or call \string\setfont\space
    or \string\mathfont\MessageBreak manually}}
  \fi
\fi
```

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

```
\ifM@font@loaded
  \AtEndOfPackage{%
  \setfont\M@font@load
  \newmathrm\mathrm\M@font@load
  \newmathit\mathit\M@font@load
  \newmathbf\mathbf\M@font@load
  \newmathbfit\mathbfit\M@font@load}
\fi
```

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

```
\AtBeginDocument{%
  \if@bb
    \@ifpackageloaded{amsmath}{\PackageWarningNoLine{mathfont}
    {Package amsmath detected. Some warning\MessageBreak
    messages for \string\mathbb\space may be duplicated\MessageBreak
    inside the align environment}}{}
  \fi
  \if@cal
    \@ifpackageloaded{amsmath}{\PackageWarningNoLine{mathfont}
    {Package amsmath detected. Some warning\MessageBreak
    messages for \string\mathcal\space may be duplicated\MessageBreak
    inside the align environment}}{}
  \fi
  \if@frak
    \@ifpackageloaded{amsmath}{\PackageWarningNoLine{mathfont}
```

```
    {Package amsmath detected. Some warning\MessageBreak
    messages for \string\mathfrak\space may be duplicated\MessageBreak
    inside the align environment}}{}
  \fi
  \if@bcal
    \@ifpackageloaded{amsmath}{\PackageWarningNoLine{mathfont}
    {Package amsmath detected. Some warning\MessageBreak
    messages for \string\mathbcal\space may be duplicated\MessageBreak
    inside the align environment}}{}
  \fi
  \if@bfrak
    \@ifpackageloaded{amsmath}{\PackageWarningNoLine{mathfont}
    {Package amsmath detected. Some warning\MessageBreak
    messages for \string\mathbfrak\space may be duplicated\MessageBreak
    inside the align environment}}{}
  \fi}
```

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

```
\@onlypreamble\M@upper@set
\@onlypreamble\M@lower@set
\@onlypreamble\M@diacritics@set
\@onlypreamble\M@greekupper@set
\@onlypreamble\M@greeklower@set
\@onlypreamble\M@agreekupper@set
\@onlypreamble\M@agreeklower@set
\@onlypreamble\M@cyrillicupper@set
\@onlypreamble\M@cyrilliclower@set
\@onlypreamble\M@hebrew@set
\@onlypreamble\M@digits@set
\@onlypreamble\M@operator@set
\@onlypreamble\M@symbols@set
\@onlypreamble\M@extsymbols@set
\@onlypreamble\M@delimiters@set
\@onlypreamble\M@arrows@set
\@onlypreamble\M@bigops@set
\@onlypreamble\M@extbigops@set
\@onlypreamble\M@bb@set
\@onlypreamble\M@cal@set
\@onlypreamble\M@frak@set
\@onlypreamble\M@bcal@set
\@onlypreamble\M@bfrak@set
```

9 Unicode Hex Values

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

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

```
  \edef\M@upper{M\@uppershape\the\M@count}
  \DeclareMathSymbol{A}{\mathalpha}{\M@upper}{‘A}
  \DeclareMathSymbol{B}{\mathalpha}{\M@upper}{‘B}
  \DeclareMathSymbol{C}{\mathalpha}{\M@upper}{‘C}
  \DeclareMathSymbol{D}{\mathalpha}{\M@upper}{‘D}
  \DeclareMathSymbol{E}{\mathalpha}{\M@upper}{‘E}
  \DeclareMathSymbol{F}{\mathalpha}{\M@upper}{‘F}
  \DeclareMathSymbol{G}{\mathalpha}{\M@upper}{‘G}
  \DeclareMathSymbol{H}{\mathalpha}{\M@upper}{‘H}
  \DeclareMathSymbol{I}{\mathalpha}{\M@upper}{‘I}
  \DeclareMathSymbol{J}{\mathalpha}{\M@upper}{‘J}
  \DeclareMathSymbol{K}{\mathalpha}{\M@upper}{‘K}
  \DeclareMathSymbol{L}{\mathalpha}{\M@upper}{‘L}
  \DeclareMathSymbol{M}{\mathalpha}{\M@upper}{‘M}
  \DeclareMathSymbol{N}{\mathalpha}{\M@upper}{‘N}
  \DeclareMathSymbol{O}{\mathalpha}{\M@upper}{‘O}
  \DeclareMathSymbol{P}{\mathalpha}{\M@upper}{‘P}
  \DeclareMathSymbol{Q}{\mathalpha}{\M@upper}{‘Q}
  \DeclareMathSymbol{R}{\mathalpha}{\M@upper}{‘R}
  \DeclareMathSymbol{S}{\mathalpha}{\M@upper}{‘S}
  \DeclareMathSymbol{T}{\mathalpha}{\M@upper}{‘T}
  \DeclareMathSymbol{U}{\mathalpha}{\M@upper}{‘U}
  \DeclareMathSymbol{V}{\mathalpha}{\M@upper}{‘V}
  \DeclareMathSymbol{W}{\mathalpha}{\M@upper}{‘W}
  \DeclareMathSymbol{X}{\mathalpha}{\M@upper}{‘X}
  \DeclareMathSymbol{Y}{\mathalpha}{\M@upper}{‘Y}
  \DeclareMathSymbol{Z}{\mathalpha}{\M@upper}{‘Z}}
```

Set minuscule Latin characters.

```
\def\M@lower@set{%
  \edef\M@lower{M\@lowershape\the\M@count}
  \DeclareMathSymbol{a}{\mathalpha}{\M@lower}{‘a}
  \DeclareMathSymbol{b}{\mathalpha}{\M@lower}{‘b}
  \DeclareMathSymbol{c}{\mathalpha}{\M@lower}{‘c}
  \DeclareMathSymbol{d}{\mathalpha}{\M@lower}{‘d}
  \DeclareMathSymbol{e}{\mathalpha}{\M@lower}{‘e}
  \DeclareMathSymbol{f}{\mathalpha}{\M@lower}{‘f}
  \DeclareMathSymbol{g}{\mathalpha}{\M@lower}{‘g}
  \DeclareMathSymbol{h}{\mathalpha}{\M@lower}{‘h}
  \DeclareMathSymbol{i}{\mathalpha}{\M@lower}{‘i}
  \DeclareMathSymbol{\imath}{\mathalpha}{\M@lower}{"131}
  \DeclareMathSymbol{j}{\mathalpha}{\M@lower}{‘j}
  \DeclareMathSymbol{\jmath}{\mathalpha}{\M@lower}{"237}
  \DeclareMathSymbol{k}{\mathalpha}{\M@lower}{‘k}
  \DeclareMathSymbol{l}{\mathalpha}{\M@lower}{‘l}
  \DeclareMathSymbol{m}{\mathalpha}{\M@lower}{‘m}
  \DeclareMathSymbol{n}{\mathalpha}{\M@lower}{‘n}
  \DeclareMathSymbol{o}{\mathalpha}{\M@lower}{‘o}
```

```
  \DeclareMathSymbol{p}{\mathalpha}{\M@lower}{‘p}
  \DeclareMathSymbol{q}{\mathalpha}{\M@lower}{‘q}
  \DeclareMathSymbol{r}{\mathalpha}{\M@lower}{‘r}
  \DeclareMathSymbol{s}{\mathalpha}{\M@lower}{‘s}
  \DeclareMathSymbol{t}{\mathalpha}{\M@lower}{‘t}
  \DeclareMathSymbol{u}{\mathalpha}{\M@lower}{‘u}
  \DeclareMathSymbol{v}{\mathalpha}{\M@lower}{‘v}
  \DeclareMathSymbol{w}{\mathalpha}{\M@lower}{‘w}
  \DeclareMathSymbol{x}{\mathalpha}{\M@lower}{‘x}
  \DeclareMathSymbol{y}{\mathalpha}{\M@lower}{‘y}
  \DeclareMathSymbol{z}{\mathalpha}{\M@lower}{‘z}}
```

Set diacritics.

```
\def\M@diacritics@set{%
  \edef\M@diacritics{M\@diacriticsshape\the\M@count}
  \DeclareMathAccent{\acute}{\mathalpha}{\M@diacritics}{"B4}
  \DeclareMathAccent{\aacute}{\mathalpha}{\M@diacritics}{"2DD}
  \DeclareMathAccent{\dot}{\mathalpha}{\M@diacritics}{"2D9}
  \DeclareMathAccent{\ddot}{\mathalpha}{\M@diacritics}{"A8}
  \DeclareMathAccent{\grave}{\mathalpha}{\M@diacritics}{"60}
  \DeclareMathAccent{\breve}{\mathalpha}{\M@diacritics}{"2D8}
  \DeclareMathAccent{\hat}{\mathalpha}{\M@diacritics}{"2C6}
  \DeclareMathAccent{\check}{\mathalpha}{\M@diacritics}{"2C7}
  \DeclareMathAccent{\bar}{\mathalpha}{\M@diacritics}{"AF}
  \DeclareMathAccent{\mathring}{\mathalpha}{\M@diacritics}{"2DA}
  \DeclareMathAccent{\tilde}{\mathalpha}{\M@diacritics}{"2DC}}
```

Set capital Greek characters.

```
\def\M@greekupper@set{%
  \edef\M@greekupper{M\@greekuppershape\the\M@count}
  \DeclareMathSymbol{\Alpha}{\mathalpha}{\M@greekupper}{"391}
  \DeclareMathSymbol{\Beta}{\mathalpha}{\M@greekupper}{"392}
  \DeclareMathSymbol{\Gamma}{\mathalpha}{\M@greekupper}{"393}
  \DeclareMathSymbol{\Delta}{\mathalpha}{\M@greekupper}{"394}
  \DeclareMathSymbol{\Epsilon}{\mathalpha}{\M@greekupper}{"395}
  \DeclareMathSymbol{\Zeta}{\mathalpha}{\M@greekupper}{"396}
  \DeclareMathSymbol{\Eta}{\mathalpha}{\M@greekupper}{"397}
  \DeclareMathSymbol{\Theta}{\mathalpha}{\M@greekupper}{"398}
  \DeclareMathSymbol{\Iota}{\mathalpha}{\M@greekupper}{"399}
  \DeclareMathSymbol{\Kappa}{\mathalpha}{\M@greekupper}{"39A}
  \DeclareMathSymbol{\Lambda}{\mathalpha}{\M@greekupper}{"39B}
  \DeclareMathSymbol{\Mu}{\mathalpha}{\M@greekupper}{"39C}
  \DeclareMathSymbol{\Nu}{\mathalpha}{\M@greekupper}{"39D}
  \DeclareMathSymbol{\Xi}{\mathalpha}{\M@greekupper}{"39E}
  \DeclareMathSymbol{\Omicron}{\mathalpha}{\M@greekupper}{"39F}
  \DeclareMathSymbol{\Pi}{\mathalpha}{\M@greekupper}{"3A0}
  \DeclareMathSymbol{\Rho}{\mathalpha}{\M@greekupper}{"3A1}
  \DeclareMathSymbol{\Sigma}{\mathalpha}{\M@greekupper}{"3A3}
  \DeclareMathSymbol{\Tau}{\mathalpha}{\M@greekupper}{"3A4}
```

```
  \DeclareMathSymbol{\Upsilon}{\mathalpha}{\M@greekupper}{"3A5}
  \DeclareMathSymbol{\Phi}{\mathalpha}{\M@greekupper}{"3A6}
  \DeclareMathSymbol{\Chi}{\mathalpha}{\M@greekupper}{"3A7}
  \DeclareMathSymbol{\Psi}{\mathalpha}{\M@greekupper}{"3A8}
  \DeclareMathSymbol{\Omega}{\mathalpha}{\M@greekupper}{"3A9}
  \DeclareMathSymbol{\varTheta}{\mathalpha}{\M@greekupper}{"3F4}}
```

Set minuscule Greek characters.

```
\def\M@greeklower@set{%
  \edef\M@greeklower{M\@greeklowershape\the\M@count}
  \DeclareMathSymbol{\alpha}{\mathalpha}{\M@greeklower}{"3B1}
  \DeclareMathSymbol{\beta}{\mathalpha}{\M@greeklower}{"3B2}
  \DeclareMathSymbol{\gamma}{\mathalpha}{\M@greeklower}{"3B3}
  \DeclareMathSymbol{\delta}{\mathalpha}{\M@greeklower}{"3B4}
  \DeclareMathSymbol{\epsilon}{\mathalpha}{\M@greeklower}{"3F5}
  \DeclareMathSymbol{\zeta}{\mathalpha}{\M@greeklower}{"3B6}
  \DeclareMathSymbol{\eta}{\mathalpha}{\M@greeklower}{"3B7}
  \DeclareMathSymbol{\theta}{\mathalpha}{\M@greeklower}{"3B8}
  \DeclareMathSymbol{\iota}{\mathalpha}{\M@greeklower}{"3B9}
  \DeclareMathSymbol{\kappa}{\mathalpha}{\M@greeklower}{"3BA}
  \DeclareMathSymbol{\lambda}{\mathalpha}{\M@greeklower}{"3BB}
  \DeclareMathSymbol{\mu}{\mathalpha}{\M@greeklower}{"3BC}
  \DeclareMathSymbol{\nu}{\mathalpha}{\M@greeklower}{"3BD}
  \DeclareMathSymbol{\xi}{\mathalpha}{\M@greeklower}{"3BE}
  \DeclareMathSymbol{\omicron}{\mathalpha}{\M@greeklower}{"3BF}
  \DeclareMathSymbol{\pi}{\mathalpha}{\M@greeklower}{"3C0}
  \DeclareMathSymbol{\rho}{\mathalpha}{\M@greeklower}{"3C1}
  \DeclareMathSymbol{\sigma}{\mathalpha}{\M@greeklower}{"3C3}
  \DeclareMathSymbol{\tau}{\mathalpha}{\M@greeklower}{"3C4}
  \DeclareMathSymbol{\upsilon}{\mathalpha}{\M@greeklower}{"3C5}
  \DeclareMathSymbol{\phi}{\mathalpha}{\M@greeklower}{"3D5}
  \DeclareMathSymbol{\chi}{\mathalpha}{\M@greeklower}{"3C7}
  \DeclareMathSymbol{\psi}{\mathalpha}{\M@greeklower}{"3C8}
  \DeclareMathSymbol{\omega}{\mathalpha}{\M@greeklower}{"3C9}
  \DeclareMathSymbol{\varbeta}{\mathalpha}{\M@greeklower}{"3D0}
  \DeclareMathSymbol{\varepsilon}{\mathalpha}{\M@greeklower}{"3B5}
  \DeclareMathSymbol{\vartheta}{\mathalpha}{\M@greeklower}{"3D1}
  \DeclareMathSymbol{\varrho}{\mathalpha}{\M@greeklower}{"3F1}
  \DeclareMathSymbol{\varsigma}{\mathalpha}{\M@greeklower}{"3C2}
  \DeclareMathSymbol{\varphi}{\mathalpha}{\M@greeklower}{"3C6}}
```

Set capital ancient Greek characters.

```
\def\M@agreekupper@set{%
  \edef\M@agreekupper{M\@agreekuppershape\the\M@count}
  \DeclareMathSymbol{\Heta}{\mathalpha}{\M@agreekupper}{"370}
  \DeclareMathSymbol{\Sampi}{\mathalpha}{\M@agreekupper}{"3E0}
  \DeclareMathSymbol{\Digamma}{\mathalpha}{\M@agreekupper}{"3DC}
  \DeclareMathSymbol{\Koppa}{\mathalpha}{\M@agreekupper}{"3D8}
  \DeclareMathSymbol{\Stigma}{\mathalpha}{\M@agreekupper}{"3DA}
```

```
  \DeclareMathSymbol{\Sho}{\mathalpha}{\M@agreekupper}{"3F7}
  \DeclareMathSymbol{\San}{\mathalpha}{\M@agreekupper}{"3FA}
  \DeclareMathSymbol{\varSampi}{\mathalpha}{\M@agreekupper}{"372}
  \DeclareMathSymbol{\varDigamma}{\mathalpha}{\M@agreekupper}{"376}
  \DeclareMathSymbol{\varKoppa}{\mathalpha}{\M@agreekupper}{"3DE}}
```

Set minuscule ancient Greek characters.

```
\def\M@agreeklower@set{%
  \edef\M@agreeklower{M\@agreeklowershape\the\M@count}
  \DeclareMathSymbol{\heta}{\mathalpha}{\M@agreeklower}{"371}
  \DeclareMathSymbol{\sampi}{\mathalpha}{\M@agreeklower}{"3E1}
  \DeclareMathSymbol{\digamma}{\mathalpha}{\M@agreeklower}{"3DD}
  \DeclareMathSymbol{\koppa}{\mathalpha}{\M@agreeklower}{"3D9}
  \DeclareMathSymbol{\stigma}{\mathalpha}{\M@agreeklower}{"3DB}
  \DeclareMathSymbol{\sho}{\mathalpha}{\M@agreeklower}{"3F8}
  \DeclareMathSymbol{\san}{\mathalpha}{\M@agreeklower}{"3FB}
  \DeclareMathSymbol{\varsampi}{\mathalpha}{\M@agreeklower}{"373}
  \DeclareMathSymbol{\vardigamma}{\mathalpha}{\M@agreeklower}{"377}
  \DeclareMathSymbol{\varkoppa}{\mathalpha}{\M@agreeklower}{"3DF}}
```

Set capital Cyrillic characters.

```
\def\M@cyrillicupper@set{%
  \edef\M@cyrillicupper{M\@cyrillicuppershape\the\M@count}
  \DeclareMathSymbol{\cyrA}{\mathalpha}{\M@cyrillicupper}{"410}
  \DeclareMathSymbol{\cyrBe}{\mathalpha}{\M@cyrillicupper}{"411}
  \DeclareMathSymbol{\cyrVe}{\mathalpha}{\M@cyrillicupper}{"412}
  \DeclareMathSymbol{\cyrGhe}{\mathalpha}{\M@cyrillicupper}{"413}
  \DeclareMathSymbol{\cyrDe}{\mathalpha}{\M@cyrillicupper}{"414}
  \DeclareMathSymbol{\cyrIe}{\mathalpha}{\M@cyrillicupper}{"415}
  \DeclareMathSymbol{\cyrZhe}{\mathalpha}{\M@cyrillicupper}{"416}
  \DeclareMathSymbol{\cyrZe}{\mathalpha}{\M@cyrillicupper}{"417}
  \DeclareMathSymbol{\cyrI}{\mathalpha}{\M@cyrillicupper}{"418}
  \DeclareMathSymbol{\cyrKa}{\mathalpha}{\M@cyrillicupper}{"41A}
  \DeclareMathSymbol{\cyrEl}{\mathalpha}{\M@cyrillicupper}{"41B}
  \DeclareMathSymbol{\cyrEm}{\mathalpha}{\M@cyrillicupper}{"41C}
  \DeclareMathSymbol{\cyrEn}{\mathalpha}{\M@cyrillicupper}{"41D}
  \DeclareMathSymbol{\cyrO}{\mathalpha}{\M@cyrillicupper}{"41E}
  \DeclareMathSymbol{\cyrPe}{\mathalpha}{\M@cyrillicupper}{"41F}
  \DeclareMathSymbol{\cyrEr}{\mathalpha}{\M@cyrillicupper}{"420}
  \DeclareMathSymbol{\cyrEs}{\mathalpha}{\M@cyrillicupper}{"421}
  \DeclareMathSymbol{\cyrTe}{\mathalpha}{\M@cyrillicupper}{"422}
  \DeclareMathSymbol{\cyrU}{\mathalpha}{\M@cyrillicupper}{"423}
  \DeclareMathSymbol{\cyrEf}{\mathalpha}{\M@cyrillicupper}{"424}
  \DeclareMathSymbol{\cyrHa}{\mathalpha}{\M@cyrillicupper}{"425}
  \DeclareMathSymbol{\cyrTse}{\mathalpha}{\M@cyrillicupper}{"426}
  \DeclareMathSymbol{\cyrChe}{\mathalpha}{\M@cyrillicupper}{"427}
  \DeclareMathSymbol{\cyrSha}{\mathalpha}{\M@cyrillicupper}{"428}
  \DeclareMathSymbol{\cyrShcha}{\mathalpha}{\M@cyrillicupper}{"429}
  \DeclareMathSymbol{\cyrHard}{\mathalpha}{\M@cyrillicupper}{"42A}
```

```
  \DeclareMathSymbol{\cyrYeru}{\mathalpha}{\M@cyrillicupper}{"42B}
  \DeclareMathSymbol{\cyrSoft}{\mathalpha}{\M@cyrillicupper}{"42C}
  \DeclareMathSymbol{\cyrE}{\mathalpha}{\M@cyrillicupper}{"42D}
  \DeclareMathSymbol{\cyrYu}{\mathalpha}{\M@cyrillicupper}{"42E}
  \DeclareMathSymbol{\cyrYa}{\mathalpha}{\M@cyrillicupper}{"42F}
  \DeclareMathSymbol{\cyrvarI}{\mathalpha}{\M@cyrillicupper}{"419}}
```

Set minuscule Cyrillic characters.

```
\def\M@cyrilliclower@set{%
  \edef\M@cyrilliclower{M\@cyrilliclowershape\the\M@count}
  \DeclareMathSymbol{\cyra}{\mathalpha}{\M@cyrilliclower}{"430}
  \DeclareMathSymbol{\cyrbe}{\mathalpha}{\M@cyrilliclower}{"431}
  \DeclareMathSymbol{\cyrve}{\mathalpha}{\M@cyrilliclower}{"432}
  \DeclareMathSymbol{\cyrghe}{\mathalpha}{\M@cyrilliclower}{"433}
  \DeclareMathSymbol{\cyrde}{\mathalpha}{\M@cyrilliclower}{"434}
  \DeclareMathSymbol{\cyrie}{\mathalpha}{\M@cyrilliclower}{"435}
  \DeclareMathSymbol{\cyrzhe}{\mathalpha}{\M@cyrilliclower}{"436}
  \DeclareMathSymbol{\cyrze}{\mathalpha}{\M@cyrilliclower}{"437}
  \DeclareMathSymbol{\cyri}{\mathalpha}{\M@cyrilliclower}{"438}
  \DeclareMathSymbol{\cyrka}{\mathalpha}{\M@cyrilliclower}{"43A}
  \DeclareMathSymbol{\cyrel}{\mathalpha}{\M@cyrilliclower}{"43B}
  \DeclareMathSymbol{\cyrem}{\mathalpha}{\M@cyrilliclower}{"43C}
  \DeclareMathSymbol{\cyren}{\mathalpha}{\M@cyrilliclower}{"43D}
  \DeclareMathSymbol{\cyro}{\mathalpha}{\M@cyrilliclower}{"43E}
  \DeclareMathSymbol{\cyrpe}{\mathalpha}{\M@cyrilliclower}{"43F}
  \DeclareMathSymbol{\cyrer}{\mathalpha}{\M@cyrilliclower}{"440}
  \DeclareMathSymbol{\cyres}{\mathalpha}{\M@cyrilliclower}{"441}
  \DeclareMathSymbol{\cyrte}{\mathalpha}{\M@cyrilliclower}{"442}
  \DeclareMathSymbol{\cyru}{\mathalpha}{\M@cyrilliclower}{"443}
  \DeclareMathSymbol{\cyref}{\mathalpha}{\M@cyrilliclower}{"444}
  \DeclareMathSymbol{\cyrha}{\mathalpha}{\M@cyrilliclower}{"445}
  \DeclareMathSymbol{\cyrtse}{\mathalpha}{\M@cyrilliclower}{"446}
  \DeclareMathSymbol{\cyrche}{\mathalpha}{\M@cyrilliclower}{"447}
  \DeclareMathSymbol{\cyrsha}{\mathalpha}{\M@cyrilliclower}{"448}
  \DeclareMathSymbol{\cyrshcha}{\mathalpha}{\M@cyrilliclower}{"449}
  \DeclareMathSymbol{\cyrhard}{\mathalpha}{\M@cyrilliclower}{"44A}
  \DeclareMathSymbol{\cyryeru}{\mathalpha}{\M@cyrilliclower}{"44B}
  \DeclareMathSymbol{\cyrsoft}{\mathalpha}{\M@cyrilliclower}{"44C}
  \DeclareMathSymbol{\cyre}{\mathalpha}{\M@cyrilliclower}{"44D}
  \DeclareMathSymbol{\cyryu}{\mathalpha}{\M@cyrilliclower}{"44E}
  \DeclareMathSymbol{\cyrya}{\mathalpha}{\M@cyrilliclower}{"44F}
  \DeclareMathSymbol{\cyrvari}{\mathalpha}{\M@cyrilliclower}{"439}}
```

Set Hebrew characters.

```
\def\M@hebrew@set{%
  \edef\M@hebrew{M\@hebrewshape\the\M@count}
  \DeclareMathSymbol{\aleph}{\mathalpha}{\M@hebrew}{"5D0}
  \DeclareMathSymbol{\beth}{\mathalpha}{\M@hebrew}{"5D1}
  \DeclareMathSymbol{\gimel}{\mathalpha}{\M@hebrew}{"5D2}
```

```
  \DeclareMathSymbol{\daleth}{\mathalpha}{\M@hebrew}{"5D3}
  \DeclareMathSymbol{\he}{\mathalpha}{\M@hebrew}{"5D4}
  \DeclareMathSymbol{\vav}{\mathalpha}{\M@hebrew}{"5D5}
  \DeclareMathSymbol{\zayin}{\mathalpha}{\M@hebrew}{"5D6}
  \DeclareMathSymbol{\het}{\mathalpha}{\M@hebrew}{"5D7}
  \DeclareMathSymbol{\tet}{\mathalpha}{\M@hebrew}{"5D8}
  \DeclareMathSymbol{\yod}{\mathalpha}{\M@hebrew}{"5D9}
  \DeclareMathSymbol{\kaf}{\mathalpha}{\M@hebrew}{"5DB}
  \DeclareMathSymbol{\lamed}{\mathalpha}{\M@hebrew}{"5DC}
  \DeclareMathSymbol{\mem}{\mathalpha}{\M@hebrew}{"5DE}
  \DeclareMathSymbol{\nun}{\mathalpha}{\M@hebrew}{"5E0}
  \DeclareMathSymbol{\samekh}{\mathalpha}{\M@hebrew}{"5E1}
  \DeclareMathSymbol{\ayin}{\mathalpha}{\M@hebrew}{"5E2}
  \DeclareMathSymbol{\pe}{\mathalpha}{\M@hebrew}{"5E4}
  \DeclareMathSymbol{\tsadi}{\mathalpha}{\M@hebrew}{"5E6}
  \DeclareMathSymbol{\qof}{\mathalpha}{\M@hebrew}{"5E7}
  \DeclareMathSymbol{\resh}{\mathalpha}{\M@hebrew}{"5E8}
  \DeclareMathSymbol{\shin}{\mathalpha}{\M@hebrew}{"5E9}
  \DeclareMathSymbol{\tav}{\mathalpha}{\M@hebrew}{"5EA}
  \DeclareMathSymbol{\varkaf}{\mathalpha}{\M@hebrew}{"5DA}
  \DeclareMathSymbol{\varmem}{\mathalpha}{\M@hebrew}{"5DD}
  \DeclareMathSymbol{\varnun}{\mathalpha}{\M@hebrew}{"5DF}
  \DeclareMathSymbol{\varpe}{\mathalpha}{\M@hebrew}{"5E3}
  \DeclareMathSymbol{\vartsadi}{\mathalpha}{\M@hebrew}{"5E5}}
```

Set digits.

```
\def\M@digits@set{%
  \edef\M@digits{M\@digitsshape\the\M@count}
  \DeclareMathSymbol{0}{\mathalpha}{\M@digits}{`0}
  \DeclareMathSymbol{1}{\mathalpha}{\M@digits}{`1}
  \DeclareMathSymbol{2}{\mathalpha}{\M@digits}{`2}
  \DeclareMathSymbol{3}{\mathalpha}{\M@digits}{`3}
  \DeclareMathSymbol{4}{\mathalpha}{\M@digits}{`4}
  \DeclareMathSymbol{5}{\mathalpha}{\M@digits}{`5}
  \DeclareMathSymbol{6}{\mathalpha}{\M@digits}{`6}
  \DeclareMathSymbol{7}{\mathalpha}{\M@digits}{`7}
  \DeclareMathSymbol{8}{\mathalpha}{\M@digits}{`8}
  \DeclareMathSymbol{9}{\mathalpha}{\M@digits}{`9}}
```

Set new operator font.

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

Set symbols.

```
\def\M@symbols@set{%
  \edef\M@symbols{M\@symbolsshape\the\M@count}
  \let\colon\@undefined
  \let\mathellipsis\@undefined
```

```
\DeclareMathSymbol{.}{\mathord}{\M@symbols}{"2E}
\DeclareMathSymbol{@}{\mathord}{\M@symbols}{"40}
\DeclareMathSymbol{\mathhash}{\mathord}{\M@symbols}{"23}
\DeclareMathSymbol{\mathdollar}{\mathord}{\M@symbols}{"24}
\DeclareMathSymbol{\mathpercent}{\mathord}{\M@symbols}{"25}
\DeclareMathSymbol{\mathand}{\mathord}{\M@symbols}{"26}
\DeclareMathSymbol{\mathparagraph}{\mathord}{\M@symbols}{"B6}
\DeclareMathSymbol{\mathsection}{\mathord}{\M@symbols}{"A7}
\DeclareMathSymbol{\mathsterling}{\mathord}{\M@symbols}{"A3}
\DeclareMathSymbol{|}{\mathord}{\M@symbols}{"7C}
\DeclareMathSymbol{\neg}{\mathord}{\M@symbols}{"AC}
\DeclareMathSymbol{\infty}{\mathord}{\M@symbols}{"221E}
\DeclareMathSymbol{\partial}{\mathord}{\M@symbols}{"2202}
\DeclareMathSymbol{\mathbackslash}{\mathord}{\M@symbols}{"5C}
\DeclareMathSymbol{\degree}{\mathord}{\M@symbols}{"B0}
\DeclareMathSymbol{\increment}{\mathord}{\M@symbols}{"2206}
\DeclareMathSymbol{\hbar}{\mathord}{\M@symbols}{"127}
\DeclareMathSymbol{'}{\mathord}{\M@symbols}{"2032}
\DeclareMathSymbol{"}{\mathord}{\M@symbols}{"2033}
\DeclareMathSymbol{\comma}{\mathord}{\M@symbols}{"2C}
\DeclareMathSymbol{+}{\mathbin}{\M@symbols}{"2B}
\DeclareMathSymbol{-}{\mathbin}{\M@symbols}{"2212}
\DeclareMathSymbol{*}{\mathbin}{\M@symbols}{"2A}
\DeclareMathSymbol{\times}{\mathbin}{\M@symbols}{"D7}
\DeclareMathSymbol{/}{\mathbin}{\M@symbols}{"2215}
\DeclareMathSymbol{\div}{\mathbin}{\M@symbols}{"F7}
\DeclareMathSymbol{\pm}{\mathbin}{\M@symbols}{"B1}
\DeclareMathSymbol{\bullet}{\mathbin}{\M@symbols}{"2022}
\DeclareMathSymbol{\dagger}{\mathbin}{\M@symbols}{"2020}
\DeclareMathSymbol{\ddagger}{\mathbin}{\M@symbols}{"2021}
\DeclareMathSymbol{\cdot}{\mathbin}{\M@symbols}{"2219}
\DeclareMathSymbol{\setminus}{\mathbin}{\M@symbols}{"5C}
\DeclareMathSymbol{=}{\mathrel}{\M@symbols}{"3D}
\DeclareMathSymbol{<}{\mathrel}{\M@symbols}{"3C}
\DeclareMathSymbol{>}{\mathrel}{\M@symbols}{"3E}
\DeclareMathSymbol{\leq}{\mathrel}{\M@symbols}{"2264}
\DeclareMathSymbol{\geq}{\mathrel}{\M@symbols}{"2265}
\DeclareMathSymbol{\sim}{\mathrel}{\M@symbols}{"7E}
\DeclareMathSymbol{\approx}{\mathrel}{\M@symbols}{"2248}
\DeclareMathSymbol{\equiv}{\mathrel}{\M@symbols}{"2261}
\DeclareMathSymbol{\mid}{\mathrel}{\M@symbols}{"7C}
\DeclareMathSymbol{\parallel}{\mathrel}{\M@symbols}{"2016}
\DeclareMathSymbol{:}{\mathrel}{\M@symbols}{"3A}
\DeclareMathSymbol{?}{\mathclose}{\M@symbols}{"3F}
\DeclareMathSymbol{!}{\mathclose}{\M@symbols}{"21}
\DeclareMathSymbol{,}{\mathpunct}{\M@symbols}{"2C}
\DeclareMathSymbol{;}{\mathpunct}{\M@symbols}{"3B}
```

```
\DeclareMathSymbol{\colon}{\mathpunct}{\M@symbols}{"3A}
\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 charcters used in several math-mode symbols.

```
\DeclareRobustCommand\#{\ifmmode\mathhash\else\char"23\relax\fi}
\DeclareRobustCommand\%{\ifmmode\mathpercent\else\char"25\relax\fi}
\DeclareRobustCommand\&{\ifmmode\mathand\else\char"26\relax\fi}
\DeclareMathSymbol{\@relbar}{\mathbin}{symbols}{"00}
\DeclareMathSymbol{\@Relbar}{\mathrel}{operators}{"3D}
\DeclareMathSymbol{\@verticalbar}{\mathord}{symbols}{"6A}
\DeclareRobustCommand\relbar{\mathrel{\smash\@relbar}}
\DeclareRobustCommand\Relbar{\mathrel{\@Relbar}}
\DeclareRobustCommand\models{\mathrel{\@verticalbar}\joinrel\Relbar}}
```

Set extended symbols.

```
\def\M@extsymbols@set{%
  \edef\M@extsymbols{M\@extsymbolsshape\the\M@count}
  \let\angle\@undefined
  \let\sqsubset\@undefined
  \let\sqsupset\@undefined
  \let\bowtie\@undefined
  \let\doteq\@undefined
  \let\neq\@undefined
  \let\ng\@undefined
  \DeclareMathSymbol{\wp}{\mathord}{\M@extsymbols}{"2118}
  \DeclareMathSymbol{\Re}{\mathord}{\M@extsymbols}{"211C}
  \DeclareMathSymbol{\Im}{\mathord}{\M@extsymbols}{"2111}
  \DeclareMathSymbol{\ell}{\mathord}{\M@extsymbols}{"2113}
  \DeclareMathSymbol{\forall}{\mathord}{\M@extsymbols}{"2200}
  \DeclareMathSymbol{\exists}{\mathord}{\M@extsymbols}{"2203}
  \DeclareMathSymbol{\emptyset}{\mathord}{\M@extsymbols}{"2205}
  \DeclareMathSymbol{\nabla}{\mathord}{\M@extsymbols}{"2207}
  \DeclareMathSymbol{\in}{\mathord}{\M@extsymbols}{"2208}
  \DeclareMathSymbol{\ni}{\mathord}{\M@extsymbols}{"220B}
  \DeclareMathSymbol{\mp}{\mathord}{\M@extsymbols}{"2213}
  \DeclareMathSymbol{\angle}{\mathord}{\M@extsymbols}{"2220}
  \DeclareMathSymbol{\top}{\mathord}{\M@extsymbols}{"22A4}
  \DeclareMathSymbol{\bot}{\mathord}{\M@extsymbols}{"22A5}
  \DeclareMathSymbol{\vdash}{\mathord}{\M@extsymbols}{"22A2}
  \DeclareMathSymbol{\dashv}{\mathord}{\M@extsymbols}{"22A3}
  \DeclareMathSymbol{\flat}{\mathord}{\M@extsymbols}{"266D}
  \DeclareMathSymbol{\natural}{\mathord}{\M@extsymbols}{"266E}
  \DeclareMathSymbol{\sharp}{\mathord}{\M@extsymbols}{"266F}
  \DeclareMathSymbol{\fflat}{\mathord}{\M@extsymbols}{"1D12B}
```

```
\DeclareMathSymbol{\ssharp}{\mathord}{\M@extsymbols}{"1D12A}
\DeclareMathSymbol{\bclubsuit}{\mathord}{\M@extsymbols}{"2663}
  \let\clubsuit\bclubsuit
\DeclareMathSymbol{\bdiamondsuit}{\mathord}{\M@extsymbols}{"2666}
\DeclareMathSymbol{\bheartsuit}{\mathord}{\M@extsymbols}{"2665}
\DeclareMathSymbol{\bspadesuit}{\mathord}{\M@extsymbols}{"2660}
  \let\spadesuit\bspadesuit
\DeclareMathSymbol{\wclubsuit}{\mathord}{\M@extsymbols}{"2667}
\DeclareMathSymbol{\wdiamondsuit}{\mathord}{\M@extsymbols}{"2662}
  \let\diamondsuit\wdiamondsuit
\DeclareMathSymbol{\wheartsuit}{\mathord}{\M@extsymbols}{"2661}
  \let\heartsuit\wheartsuit
\DeclareMathSymbol{\wspadesuit}{\mathord}{\M@extsymbols}{"2664}
\DeclareMathSymbol{\wedge}{\mathbin}{\M@extsymbols}{"2227}
\DeclareMathSymbol{\vee}{\mathbin}{\M@extsymbols}{"2228}
\DeclareMathSymbol{\cap}{\mathord}{\M@extsymbols}{"2229}
\DeclareMathSymbol{\cup}{\mathbin}{\M@extsymbols}{"222A}
\DeclareMathSymbol{\sqcap}{\mathbin}{\M@extsymbols}{"2293}
\DeclareMathSymbol{\sqcup}{\mathbin}{\M@extsymbols}{"2294}
\DeclareMathSymbol{\amalg}{\mathbin}{\M@extsymbols}{"2A3F}
\DeclareMathSymbol{\wr}{\mathbin}{\M@extsymbols}{"2240}
\DeclareMathSymbol{\ast}{\mathbin}{\M@extsymbols}{"2217}
\DeclareMathSymbol{\star}{\mathbin}{\M@extsymbols}{"22C6}
\DeclareMathSymbol{\diamond}{\mathbin}{\M@extsymbols}{"22C4}
\DeclareMathSymbol{\varcdot}{\mathbin}{\M@extsymbols}{"22C5}
\DeclareMathSymbol{\varsetminus}{\mathbin}{\M@extsymbols}{"2216}
\DeclareMathSymbol{\oplus}{\mathbin}{\M@extsymbols}{"2295}
\DeclareMathSymbol{\otimes}{\mathbin}{\M@extsymbols}{"2297}
\DeclareMathSymbol{\ominus}{\mathbin}{\M@extsymbols}{"2296}
\DeclareMathSymbol{\odiv}{\mathbin}{\M@extsymbols}{"2A38}
\DeclareMathSymbol{\oslash}{\mathbin}{\M@extsymbols}{"2298}
\DeclareMathSymbol{\odot}{\mathbin}{\M@extsymbols}{"2299}
\DeclareMathSymbol{\sqplus}{\mathbin}{\M@extsymbols}{"229E}
\DeclareMathSymbol{\sqtimes}{\mathbin}{\M@extsymbols}{"22A0}
\DeclareMathSymbol{\sqminus}{\mathbin}{\M@extsymbols}{"229F}
\DeclareMathSymbol{\sqdot}{\mathbin}{\M@extsymbols}{"22A1}
\DeclareMathSymbol{\in}{\mathrel}{\M@extsymbols}{"2208}
\DeclareMathSymbol{\ni}{\mathrel}{\M@extsymbols}{"220B}
\DeclareMathSymbol{\subset}{\mathrel}{\M@extsymbols}{"2282}
\DeclareMathSymbol{\supset}{\mathrel}{\M@extsymbols}{"2283}
\DeclareMathSymbol{\subseteq}{\mathrel}{\M@extsymbols}{"2286}
\DeclareMathSymbol{\supseteq}{\mathrel}{\M@extsymbols}{"2287}
\DeclareMathSymbol{\sqsubset}{\mathrel}{\M@extsymbols}{"228F}
\DeclareMathSymbol{\sqsupset}{\mathrel}{\M@extsymbols}{"2290}
\DeclareMathSymbol{\sqsubseteq}{\mathrel}{\M@extsymbols}{"2291}
\DeclareMathSymbol{\sqsupseteq}{\mathrel}{\M@extsymbols}{"2292}
\DeclareMathSymbol{\triangleleft}{\mathrel}{\M@extsymbols}{"22B2}
```

```
\DeclareMathSymbol{\triangleright}{\mathrel}{\M@extsymbols}{"22B3}
\DeclareMathSymbol{\trianglelefteq}{\mathrel}{\M@extsymbols}{"22B4}
\DeclareMathSymbol{\trianglerighteq}{\mathrel}{\M@extsymbols}{"22B5}
\DeclareMathSymbol{\propto}{\mathrel}{\M@extsymbols}{"221D}
\DeclareMathSymbol{\bowtie}{\mathrel}{\M@extsymbols}{"22C8}
\DeclareMathSymbol{\hourglass}{\mathrel}{\M@extsymbols}{"29D6}
\DeclareMathSymbol{\therefore}{\mathrel}{\M@extsymbols}{"2234}
\DeclareMathSymbol{\because}{\mathrel}{\M@extsymbols}{"2235}
\DeclareMathSymbol{\ratio}{\mathrel}{\M@extsymbols}{"2236}
\DeclareMathSymbol{\proportion}{\mathrel}{\M@extsymbols}{"2237}
\DeclareMathSymbol{\ll}{\mathrel}{\M@extsymbols}{"226A}
\DeclareMathSymbol{\gg}{\mathrel}{\M@extsymbols}{"226B}
\DeclareMathSymbol{\lll}{\mathrel}{\M@extsymbols}{"22D8}
\DeclareMathSymbol{\ggg}{\mathrel}{\M@extsymbols}{"22D9}
\DeclareMathSymbol{\leqq}{\mathrel}{\M@extsymbols}{"2266}
\DeclareMathSymbol{\geqq}{\mathrel}{\M@extsymbols}{"2267}
\DeclareMathSymbol{\lapprox}{\mathrel}{\M@extsymbols}{"2A85}
\DeclareMathSymbol{\gapprox}{\mathrel}{\M@extsymbols}{"2A86}
\DeclareMathSymbol{\simeq}{\mathrel}{\M@extsymbols}{"2243}
\DeclareMathSymbol{\eqsim}{\mathrel}{\M@extsymbols}{"2242}
\DeclareMathSymbol{\simeqq}{\mathrel}{\M@extsymbols}{"2245}
  \let\cong\simeqq
\DeclareMathSymbol{\approxeq}{\mathrel}{\M@extsymbols}{"224A}
\DeclareMathSymbol{\sssim}{\mathrel}{\M@extsymbols}{"224B}
\DeclareMathSymbol{\seq}{\mathrel}{\M@extsymbols}{"224C}
\DeclareMathSymbol{\doteq}{\mathrel}{\M@extsymbols}{"2250}
\DeclareMathSymbol{\coloneq}{\mathrel}{\M@extsymbols}{"2254}
\DeclareMathSymbol{\eqcolon}{\mathrel}{\M@extsymbols}{"2255}
\DeclareMathSymbol{\ringeq}{\mathrel}{\M@extsymbols}{"2257}
\DeclareMathSymbol{\arceq}{\mathrel}{\M@extsymbols}{"2258}
\DeclareMathSymbol{\wedgeeq}{\mathrel}{\M@extsymbols}{"2259}
\DeclareMathSymbol{\veeeq}{\mathrel}{\M@extsymbols}{"225A}
\DeclareMathSymbol{\stareq}{\mathrel}{\M@extsymbols}{"225B}
\DeclareMathSymbol{\triangleeq}{\mathrel}{\M@extsymbols}{"225C}
\DeclareMathSymbol{\defeq}{\mathrel}{\M@extsymbols}{"225D}
\DeclareMathSymbol{\qeq}{\mathrel}{\M@extsymbols}{"225F}
\DeclareMathSymbol{\lsim}{\mathrel}{\M@extsymbols}{"2272}
\DeclareMathSymbol{\gsim}{\mathrel}{\M@extsymbols}{"2273}
\DeclareMathSymbol{\prec}{\mathrel}{\M@extsymbols}{"227A}
\DeclareMathSymbol{\succ}{\mathrel}{\M@extsymbols}{"227B}
\DeclareMathSymbol{\preceq}{\mathrel}{\M@extsymbols}{"227C}
\DeclareMathSymbol{\succeq}{\mathrel}{\M@extsymbols}{"227D}
\DeclareMathSymbol{\preceqq}{\mathrel}{\M@extsymbols}{"2AB3}
\DeclareMathSymbol{\succeqq}{\mathrel}{\M@extsymbols}{"2AB4}
\DeclareMathSymbol{\precsim}{\mathrel}{\M@extsymbols}{"227E}
\DeclareMathSymbol{\succsim}{\mathrel}{\M@extsymbols}{"227F}
\DeclareMathSymbol{\precapprox}{\mathrel}{\M@extsymbols}{"2AB7}
```

```
\DeclareMathSymbol{\succapprox}{\mathrel}{\M@extsymbols}{"2AB8}
\DeclareMathSymbol{\precprec}{\mathrel}{\M@extsymbols}{"2ABB}
\DeclareMathSymbol{\succsucc}{\mathrel}{\M@extsymbols}{"2ABC}
\DeclareMathSymbol{\asymp}{\mathrel}{\M@extsymbols}{"224D}
\DeclareMathSymbol{\nin}{\mathrel}{\M@extsymbols}{"2209}
\DeclareMathSymbol{\nni}{\mathrel}{\M@extsymbols}{"220C}
\DeclareMathSymbol{\nsubset}{\mathrel}{\M@extsymbols}{"2284}
\DeclareMathSymbol{\nsupset}{\mathrel}{\M@extsymbols}{"2285}
\DeclareMathSymbol{\nsubseteq}{\mathrel}{\M@extsymbols}{"2288}
\DeclareMathSymbol{\nsupseteq}{\mathrel}{\M@extsymbols}{"2289}
\DeclareMathSymbol{\subsetneq}{\mathrel}{\M@extsymbols}{"228A}
\DeclareMathSymbol{\supsetneq}{\mathrel}{\M@extsymbols}{"228B}
\DeclareMathSymbol{\nsqsubseteq}{\mathrel}{\M@extsymbols}{"22E2}
\DeclareMathSymbol{\nsqsupseteq}{\mathrel}{\M@extsymbols}{"22E3}
\DeclareMathSymbol{\sqsubsetneq}{\mathrel}{\M@extsymbols}{"22E4}
\DeclareMathSymbol{\sqsupsetneq}{\mathrel}{\M@extsymbols}{"22E5}
\DeclareMathSymbol{\neq}{\mathrel}{\M@extsymbols}{"2260}
\DeclareMathSymbol{\nl}{\mathrel}{\M@extsymbols}{"226E}
\DeclareMathSymbol{\ng}{\mathrel}{\M@extsymbols}{"226F}
\DeclareMathSymbol{\nleq}{\mathrel}{\M@extsymbols}{"2270}
\DeclareMathSymbol{\ngeq}{\mathrel}{\M@extsymbols}{"2271}
\DeclareMathSymbol{\lneq}{\mathrel}{\M@extsymbols}{"2A87}
\DeclareMathSymbol{\gneq}{\mathrel}{\M@extsymbols}{"2A88}
\DeclareMathSymbol{\lneqq}{\mathrel}{\M@extsymbols}{"2268}
\DeclareMathSymbol{\gneqq}{\mathrel}{\M@extsymbols}{"2269}
\DeclareMathSymbol{\ntriangleleft}{\mathrel}{\M@extsymbols}{"22EA}
\DeclareMathSymbol{\ntriangleright}{\mathrel}{\M@extsymbols}{"22EB}
\DeclareMathSymbol{\ntrianglelefteq}{\mathrel}{\M@extsymbols}{"22EC}
\DeclareMathSymbol{\ntrianglerighteq}{\mathrel}{\M@extsymbols}{"22ED}
\DeclareMathSymbol{\nsim}{\mathrel}{\M@extsymbols}{"2241}
\DeclareMathSymbol{\napprox}{\mathrel}{\M@extsymbols}{"2249}
\DeclareMathSymbol{\nsimeq}{\mathrel}{\M@extsymbols}{"2244}
\DeclareMathSymbol{\nsimeqq}{\mathrel}{\M@extsymbols}{"2247}
\DeclareMathSymbol{\simneqq}{\mathrel}{\M@extsymbols}{"2246}
\DeclareMathSymbol{\nlsim}{\mathrel}{\M@extsymbols}{"2274}
\DeclareMathSymbol{\ngsim}{\mathrel}{\M@extsymbols}{"2275}
\DeclareMathSymbol{\lnsim}{\mathrel}{\M@extsymbols}{"22E6}
\DeclareMathSymbol{\gnsim}{\mathrel}{\M@extsymbols}{"22E7}
\DeclareMathSymbol{\lnapprox}{\mathrel}{\M@extsymbols}{"2A89}
\DeclareMathSymbol{\gnapprox}{\mathrel}{\M@extsymbols}{"2A8A}
\DeclareMathSymbol{\nprec}{\mathrel}{\M@extsymbols}{"2280}
\DeclareMathSymbol{\nsucc}{\mathrel}{\M@extsymbols}{"2281}
\DeclareMathSymbol{\npreceq}{\mathrel}{\M@extsymbols}{"22E0}
\DeclareMathSymbol{\nsucceq}{\mathrel}{\M@extsymbols}{"22E1}
\DeclareMathSymbol{\precneq}{\mathrel}{\M@extsymbols}{"2AB1}
\DeclareMathSymbol{\succneq}{\mathrel}{\M@extsymbols}{"2AB2}
\DeclareMathSymbol{\precneqq}{\mathrel}{\M@extsymbols}{"2AB5}
```

```
  \DeclareMathSymbol{\succneqq}{\mathrel}{\M@extsymbols}{"2AB6}
  \DeclareMathSymbol{\precnsim}{\mathrel}{\M@extsymbols}{"22E8}
  \DeclareMathSymbol{\succnsim}{\mathrel}{\M@extsymbols}{"22E9}
  \DeclareMathSymbol{\precnapprox}{\mathrel}{\M@extsymbols}{"2AB9}
  \DeclareMathSymbol{\succnapprox}{\mathrel}{\M@extsymbols}{"2ABA}
  \DeclareMathSymbol{\nequiv}{\mathrel}{\M@extsymbols}{"2262}}
```

Set delimiters.

```
\def\M@delimiters@set{%
  \edef\M@delimiters{M\@delimitersshape\the\M@count}
  \DeclareMathSymbol{(}{\mathopen}{\M@delimiters}{"28}
  \DeclareMathSymbol{)}{\mathclose}{\M@delimiters}{"29}
  \DeclareMathSymbol{[}{\mathopen}{\M@delimiters}{"5B}
  \DeclareMathSymbol{]}{\mathclose}{\M@delimiters}{"5D}
  \DeclareMathSymbol{\leftbrace}{\mathopen}{\M@delimiters}{"7B}
  \DeclareMathSymbol{\rightbrace}{\mathclose}{\M@delimiters}{"7D}}
```

Set arrows.

```
\def\M@arrows@set{%
  \edef\M@arrows{M\@arrowsshape\the\M@count}
  \let\uparrow\@undefined
  \let\Uparrow\@undefined
  \let\downarrow\@undefined
  \let\Downarrow\@undefined
  \let\updownarrow\@undefined
  \let\Updownarrow\@undefined
  \let\longrightarrow\@undefined
  \let\longleftarrow\@undefined
  \let\longleftrightarrow\@undefined
  \let\hookrightarrow\@undefined
  \let\hookleftarrow\@undefined
  \let\Longrightarrow\@undefined
  \let\Longleftarrow\@undefined
  \let\Longleftrightarrow\@undefined
  \let\rightleftharpoons\@undefined
  \DeclareMathSymbol{\rightarrow}{\mathrel}{\M@arrows}{"2192}
    \let\to\rightarrow
  \DeclareMathSymbol{\nrightarrow}{\mathrel}{\M@arrows}{"219B}
  \DeclareMathSymbol{\Rightarrow}{\mathrel}{\M@arrows}{"21D2}
  \DeclareMathSymbol{\nRightarrow}{\mathrel}{\M@arrows}{"21CF}
  \DeclareMathSymbol{\Rrightarrow}{\mathrel}{\M@arrows}{"21DB}
  \DeclareMathSymbol{\longrightarrow}{\mathrel}{\M@arrows}{"27F6}
  \DeclareMathSymbol{\Longrightarrow}{\mathrel}{\M@arrows}{"27F9}
  \DeclareMathSymbol{\rightbararrow}{\mathrel}{\M@arrows}{"21A6}
    \let\mapsto\rightbararrow
  \DeclareMathSymbol{\Rightbararrow}{\mathrel}{\M@arrows}{"2907}
  \DeclareMathSymbol{\longrightbararrow}{\mathrel}{\M@arrows}{"27FC}
    \let\longmapsto\longrightbararrow
  \DeclareMathSymbol{\Longrightbararrow}{\mathrel}{\M@arrows}{"27FE}
```

```
\DeclareMathSymbol{\hookrightarrow}{\mathrel}{\M@arrows}{"21AA}
\DeclareMathSymbol{\rightdasharrow}{\mathrel}{\M@arrows}{"21E2}
\DeclareMathSymbol{\rightharpoonup}{\mathrel}{\M@arrows}{"21C0}
\DeclareMathSymbol{\rightharpoondown}{\mathrel}{\M@arrows}{"21C1}
\DeclareMathSymbol{\rightarrowtail}{\mathrel}{\M@arrows}{"21A3}
\DeclareMathSymbol{\rightoplusarrow}{\mathrel}{\M@arrows}{"27F4}
\DeclareMathSymbol{\rightwavearrow}{\mathrel}{\M@arrows}{"219D}
\DeclareMathSymbol{\rightsquigarrow}{\mathrel}{\M@arrows}{"21DD}
\DeclareMathSymbol{\longrightsquigarrow}{\mathrel}{\M@arrows}{"27FF}
\DeclareMathSymbol{\looparrowright}{\mathrel}{\M@arrows}{"21AC}
\DeclareMathSymbol{\curvearrowright}{\mathrel}{\M@arrows}{"293B}
\DeclareMathSymbol{\circlearrowright}{\mathrel}{\M@arrows}{"21BB}
\DeclareMathSymbol{\twoheadrightarrow}{\mathrel}{\M@arrows}{"21A0}
\DeclareMathSymbol{\rightarrowtobar}{\mathrel}{\M@arrows}{"21E5}
\DeclareMathSymbol{\rightwhitearrow}{\mathrel}{\M@arrows}{"21E8}
\DeclareMathSymbol{\rightrightarrows}{\mathrel}{\M@arrows}{"21C9}
\DeclareMathSymbol{\rightrightrightarrows}{\mathrel}{\M@arrows}{"21F6}
\DeclareMathSymbol{\leftarrow}{\mathrel}{\M@arrows}{"2190}
  \let\from\leftarrow
\DeclareMathSymbol{\nleftarrow}{\mathrel}{\M@arrows}{"219A}
\DeclareMathSymbol{\Leftarrow}{\mathrel}{\M@arrows}{"21D0}
\DeclareMathSymbol{\nLeftarrow}{\mathrel}{\M@arrows}{"21CD}
\DeclareMathSymbol{\Lleftarrow}{\mathrel}{\M@arrows}{"21DA}
\DeclareMathSymbol{\longleftarrow}{\mathrel}{\M@arrows}{"27F5}
\DeclareMathSymbol{\Longleftarrow}{\mathrel}{\M@arrows}{"27F8}
\DeclareMathSymbol{\leftbararrow}{\mathrel}{\M@arrows}{"21A4}
  \let\mapsfrom\leftbararrow
\DeclareMathSymbol{\Leftbararrow}{\mathrel}{\M@arrows}{"2906}
\DeclareMathSymbol{\longleftbararrow}{\mathrel}{\M@arrows}{"27FB}
  \let\longmapsfrom\longleftbararrow
\DeclareMathSymbol{\Longleftbararrow}{\mathrel}{\M@arrows}{"27FD}
\DeclareMathSymbol{\hookleftarrow}{\mathrel}{\M@arrows}{"21A9}
\DeclareMathSymbol{\leftdasharrow}{\mathrel}{\M@arrows}{"21E0}
\DeclareMathSymbol{\leftharpoonup}{\mathrel}{\M@arrows}{"21C0}
\DeclareMathSymbol{\leftharpoondown}{\mathrel}{\M@arrows}{"21C1}
\DeclareMathSymbol{\leftarrowtail}{\mathrel}{\M@arrows}{"21A2}
\DeclareMathSymbol{\leftoplusarrow}{\mathrel}{\M@arrows}{"2B32}
\DeclareMathSymbol{\leftwavearrow}{\mathrel}{\M@arrows}{"219C}
\DeclareMathSymbol{\leftsquigarrow}{\mathrel}{\M@arrows}{"21DC}
\DeclareMathSymbol{\longleftsquigarrow}{\mathrel}{\M@arrows}{"2B33}
\DeclareMathSymbol{\looparrowleft}{\mathrel}{\M@arrows}{"21AB}
\DeclareMathSymbol{\curvearrowleft}{\mathrel}{\M@arrows}{"293A}
\DeclareMathSymbol{\circlearrowleft}{\mathrel}{\M@arrows}{"21BA}
\DeclareMathSymbol{\twoheadleftarrow}{\mathrel}{\M@arrows}{"219E}
\DeclareMathSymbol{\leftarrowtobar}{\mathrel}{\M@arrows}{"21E4}
\DeclareMathSymbol{\leftwhitearrow}{\mathrel}{\M@arrows}{"21E6}
\DeclareMathSymbol{\leftleftarrows}{\mathrel}{\M@arrows}{"21C7}
```

```
\DeclareMathSymbol{\leftleftleftarrows}{\mathrel}{\M@arrows}{"2B31}
\DeclareMathSymbol{\leftrightarrow}{\mathrel}{\M@arrows}{"2194}
\DeclareMathSymbol{\Leftrightarrow}{\mathrel}{\M@arrows}{"21D4}
\DeclareMathSymbol{\nLeftrightarrow}{\mathrel}{\M@arrows}{"21CE}
\DeclareMathSymbol{\longleftrightarrow}{\mathrel}{\M@arrows}{"27F7}
\DeclareMathSymbol{\Longleftrightarrow}{\mathrel}{\M@arrows}{"27FA}
\DeclareMathSymbol{\leftrightwavearrow}{\mathrel}{\M@arrows}{"21AD}
\DeclareMathSymbol{\leftrightarrows}{\mathrel}{\M@arrows}{"21C6}
\DeclareMathSymbol{\leftrightharpoons}{\mathrel}{\M@arrows}{"21CB}
\DeclareMathSymbol{\leftrightarrowstobar}{\mathrel}{\M@arrows}{"21B9}
\DeclareMathSymbol{\rightleftarrows}{\mathrel}{\M@arrows}{"21C4}
\DeclareMathSymbol{\rightleftharpoons}{\mathrel}{\M@arrows}{"21CC}
\DeclareMathSymbol{\uparrow}{\mathrel}{\M@arrows}{"2191}
\DeclareMathSymbol{\Uparrow}{\mathrel}{\M@arrows}{"21D1}
\DeclareMathSymbol{\Uuparrow}{\mathrel}{\M@arrows}{"290A}
\DeclareMathSymbol{\upbararrow}{\mathrel}{\M@arrows}{"21A5}
\DeclareMathSymbol{\updasharrow}{\mathrel}{\M@arrows}{"21E1}
\DeclareMathSymbol{\upharpoonleft}{\mathrel}{\M@arrows}{"21BF}
\DeclareMathSymbol{\upharpoonright}{\mathrel}{\M@arrows}{"21BE}
\DeclareMathSymbol{\twoheaduparrow}{\mathrel}{\M@arrows}{"219F}
\DeclareMathSymbol{\uparrowtobar}{\mathrel}{\M@arrows}{"2912}
\DeclareMathSymbol{\upwhitearrow}{\mathrel}{\M@arrows}{"21E7}
\DeclareMathSymbol{\upwhitebararrow}{\mathrel}{\M@arrows}{"21EA}
\DeclareMathSymbol{\upuparrows}{\mathrel}{\M@arrows}{"21C8}
\DeclareMathSymbol{\downarrow}{\mathrel}{\M@arrows}{"2193}
\DeclareMathSymbol{\Downarrow}{\mathrel}{\M@arrows}{"21D3}
\DeclareMathSymbol{\Ddownarrow}{\mathrel}{\M@arrows}{"290B}
\DeclareMathSymbol{\downbararrow}{\mathrel}{\M@arrows}{"21A7}
\DeclareMathSymbol{\downdasharrow}{\mathrel}{\M@arrows}{"21E3}
\DeclareMathSymbol{\zigzagarrow}{\mathrel}{\M@arrows}{"21AF}
  \let\lightningboltarrow\zigzagarrow
\DeclareMathSymbol{\downharpoonleft}{\mathrel}{\M@arrows}{"21C3}
\DeclareMathSymbol{\downharpoonright}{\mathrel}{\M@arrows}{"21C2}
\DeclareMathSymbol{\twoheaddownarrow}{\mathrel}{\M@arrows}{"21A1}
\DeclareMathSymbol{\downarrowtobar}{\mathrel}{\M@arrows}{"2913}
\DeclareMathSymbol{\downwhitearrow}{\mathrel}{\M@arrows}{"21E9}
\DeclareMathSymbol{\downdownarrows}{\mathrel}{\M@arrows}{"21CA}
\DeclareMathSymbol{\updownarrow}{\mathrel}{\M@arrows}{"2195}
\DeclareMathSymbol{\Updownarrow}{\mathrel}{\M@arrows}{"21D5}
\DeclareMathSymbol{\updownarrows}{\mathrel}{\M@arrows}{"21C5}
\DeclareMathSymbol{\downuparrows}{\mathrel}{\M@arrows}{"21F5}
\DeclareMathSymbol{\updownharpoons}{\mathrel}{\M@arrows}{"296E}
\DeclareMathSymbol{\downupharpoons}{\mathrel}{\M@arrows}{"296F}
\DeclareMathSymbol{\nearrow}{\mathrel}{\M@arrows}{"2197}
\DeclareMathSymbol{\Nearrow}{\mathrel}{\M@arrows}{"21D7}
\DeclareMathSymbol{\nwarrow}{\mathrel}{\M@arrows}{"2196}
\DeclareMathSymbol{\Nwarrow}{\mathrel}{\M@arrows}{"21D6}
```

```
  \DeclareMathSymbol{\searrow}{\mathrel}{\M@arrows}{"2198}
  \DeclareMathSymbol{\Searrow}{\mathrel}{\M@arrows}{"21D8}
  \DeclareMathSymbol{\swarrow}{\mathrel}{\M@arrows}{"2199}
  \DeclareMathSymbol{\Swarrow}{\mathrel}{\M@arrows}{"21D9}
  \DeclareMathSymbol{\nwsearrow}{\mathrel}{\M@arrows}{"2921}
  \DeclareMathSymbol{\neswarrow}{\mathrel}{\M@arrows}{"2922}
  \DeclareMathSymbol{\lcirclearrow}{\mathrel}{\M@arrows}{"27F2}
  \DeclareMathSymbol{\rcirclearrow}{\mathrel}{\M@arrows}{"27F3}}
```

Big operators.

```
\def\M@bigops@set{%
  \edef\M@bigops{M\@bigopsshape\the\M@count}
  \let\sum\@undefined
  \let\prod\@undefined
  \DeclareMathSymbol{\sum}{\mathop}{\M@bigops}{"2211}
  \DeclareMathSymbol{\prod}{\mathop}{\M@bigops}{"220F}
  \DeclareMathSymbol{\intop}{\mathop}{\M@bigops}{"222B}}
```

Set extended big operators.

```
\def\M@extbigops@set{%
  \edef\M@extbigops{M\@extbigopsshape\the\M@count}
  \let\coprod\@undefined
  \let\bigvee\@undefined
  \let\bigwedge\@undefined
  \let\bigcup\@undefined
  \let\bigcap\@undefined
  \let\bigoplus\@undefined
  \let\bigotimes\@undefined
  \let\bigodot\@undefined
  \let\bigsqcup\@undefined
  \DeclareMathSymbol{\coprod}{\mathop}{\M@extbigops}{"2210}
  \DeclareMathSymbol{\bigvee}{\mathop}{\M@extbigops}{"22C1}
  \DeclareMathSymbol{\bigwedge}{\mathop}{\M@extbigops}{"22C0}
  \DeclareMathSymbol{\bigcup}{\mathop}{\M@extbigops}{"22C3}
  \DeclareMathSymbol{\bigcap}{\mathord}{\M@extbigops}{"22C2}
  \DeclareMathSymbol{\iintop}{\mathop}{\M@extbigops}{"222C}
    \def\iint{\iintop\nolimits}
  \DeclareMathSymbol{\iiintop}{\mathop}{\M@extbigops}{"222D}
    \def\iiint{\iiintop\nolimits}
  \DeclareMathSymbol{\ointop}{\mathop}{\M@extbigops}{"222E}
    \def\oint{\ointop\nolimits}
  \DeclareMathSymbol{\oiintop}{\mathop}{\M@extbigops}{"222F}
    \def\oiint{\oiintop\nolimits}
  \DeclareMathSymbol{\oiiintop}{\mathop}{\M@extbigops}{"2230}
    \def\oiiint{\oiiintop\nolimits}
  \DeclareMathSymbol{\bigoplus}{\mathop}{\M@extbigops}{"2A01}
  \DeclareMathSymbol{\bigotimes}{\mathop}{\M@extbigops}{"2A02}
  \DeclareMathSymbol{\bigodot}{\mathop}{\M@extbigops}{"2A00}
  \DeclareMathSymbol{\bigsqcap}{\mathop}{\M@extbigops}{"2A05}
```

```
\DeclareMathSymbol{\bigsqcup}{\mathop}{\M@extbigops}{"2A06}}
```

Set blackboard bold letters and numbers.

```
\def\M@bb@set{%
  \edef\M@bb{M\@bbshape\the\M@count}
  \DeclareMathSymbol{\M@bb@A}{\mathord}{\M@bb}{"1D538}
  \DeclareMathSymbol{\M@bb@B}{\mathord}{\M@bb}{"1D539}
  \DeclareMathSymbol{\M@bb@C}{\mathord}{\M@bb}{"2102}
  \DeclareMathSymbol{\M@bb@D}{\mathord}{\M@bb}{"1D53B}
  \DeclareMathSymbol{\M@bb@E}{\mathord}{\M@bb}{"1D53C}
  \DeclareMathSymbol{\M@bb@F}{\mathord}{\M@bb}{"1D53D}
  \DeclareMathSymbol{\M@bb@G}{\mathord}{\M@bb}{"1D53E}
  \DeclareMathSymbol{\M@bb@H}{\mathord}{\M@bb}{"210D}
  \DeclareMathSymbol{\M@bb@I}{\mathord}{\M@bb}{"1D540}
  \DeclareMathSymbol{\M@bb@J}{\mathord}{\M@bb}{"1D541}
  \DeclareMathSymbol{\M@bb@K}{\mathord}{\M@bb}{"1D542}
  \DeclareMathSymbol{\M@bb@L}{\mathord}{\M@bb}{"1D543}
  \DeclareMathSymbol{\M@bb@M}{\mathord}{\M@bb}{"1D544}
  \DeclareMathSymbol{\M@bb@N}{\mathord}{\M@bb}{"2115}
  \DeclareMathSymbol{\M@bb@O}{\mathord}{\M@bb}{"1D546}
  \DeclareMathSymbol{\M@bb@P}{\mathord}{\M@bb}{"2119}
  \DeclareMathSymbol{\M@bb@Q}{\mathord}{\M@bb}{"211A}
  \DeclareMathSymbol{\M@bb@R}{\mathord}{\M@bb}{"211D}
  \DeclareMathSymbol{\M@bb@S}{\mathord}{\M@bb}{"1D54A}
  \DeclareMathSymbol{\M@bb@T}{\mathord}{\M@bb}{"1D54B}
  \DeclareMathSymbol{\M@bb@U}{\mathord}{\M@bb}{"1D54C}
  \DeclareMathSymbol{\M@bb@V}{\mathord}{\M@bb}{"1D54D}
  \DeclareMathSymbol{\M@bb@W}{\mathord}{\M@bb}{"1D54E}
  \DeclareMathSymbol{\M@bb@X}{\mathord}{\M@bb}{"1D54F}
  \DeclareMathSymbol{\M@bb@Y}{\mathord}{\M@bb}{"1D550}
  \DeclareMathSymbol{\M@bb@Z}{\mathord}{\M@bb}{"2124}
  \DeclareMathSymbol{\M@bb@a}{\mathord}{\M@bb}{"1D552}
  \DeclareMathSymbol{\M@bb@b}{\mathord}{\M@bb}{"1D553}
  \DeclareMathSymbol{\M@bb@c}{\mathord}{\M@bb}{"1D554}
  \DeclareMathSymbol{\M@bb@d}{\mathord}{\M@bb}{"1D555}
  \DeclareMathSymbol{\M@bb@e}{\mathord}{\M@bb}{"1D556}
  \DeclareMathSymbol{\M@bb@f}{\mathord}{\M@bb}{"1D557}
  \DeclareMathSymbol{\M@bb@g}{\mathord}{\M@bb}{"1D558}
  \DeclareMathSymbol{\M@bb@h}{\mathord}{\M@bb}{"1D559}
  \DeclareMathSymbol{\M@bb@i}{\mathord}{\M@bb}{"1D55A}
  \DeclareMathSymbol{\M@bb@j}{\mathord}{\M@bb}{"1D55B}
  \DeclareMathSymbol{\M@bb@k}{\mathord}{\M@bb}{"1D55C}
  \DeclareMathSymbol{\M@bb@l}{\mathord}{\M@bb}{"1D55D}
  \DeclareMathSymbol{\M@bb@m}{\mathord}{\M@bb}{"1D55E}
  \DeclareMathSymbol{\M@bb@n}{\mathord}{\M@bb}{"1D55F}
  \DeclareMathSymbol{\M@bb@o}{\mathord}{\M@bb}{"1D560}
  \DeclareMathSymbol{\M@bb@p}{\mathord}{\M@bb}{"1D561}
  \DeclareMathSymbol{\M@bb@q}{\mathord}{\M@bb}{"1D562}
```

```
\DeclareMathSymbol{\M@bb@r}{\mathord}{\M@bb}{"1D563}
\DeclareMathSymbol{\M@bb@s}{\mathord}{\M@bb}{"1D564}
\DeclareMathSymbol{\M@bb@t}{\mathord}{\M@bb}{"1D565}
\DeclareMathSymbol{\M@bb@u}{\mathord}{\M@bb}{"1D566}
\DeclareMathSymbol{\M@bb@v}{\mathord}{\M@bb}{"1D567}
\DeclareMathSymbol{\M@bb@w}{\mathord}{\M@bb}{"1D568}
\DeclareMathSymbol{\M@bb@x}{\mathord}{\M@bb}{"1D569}
\DeclareMathSymbol{\M@bb@y}{\mathord}{\M@bb}{"1D56A}
\DeclareMathSymbol{\M@bb@z}{\mathord}{\M@bb}{"1D56B}
\expandafter\DeclareMathSymbol\expandafter
  {\csname M@bb@0\endcsname}{\mathord}{\M@bb}{"1D7D8}
\expandafter\DeclareMathSymbol\expandafter
  {\csname M@bb@1\endcsname}{\mathord}{\M@bb}{"1D7D9}
\expandafter\DeclareMathSymbol\expandafter
  {\csname M@bb@2\endcsname}{\mathord}{\M@bb}{"1D7DA}
\expandafter\DeclareMathSymbol\expandafter
  {\csname M@bb@3\endcsname}{\mathord}{\M@bb}{"1D7DB}
\expandafter\DeclareMathSymbol\expandafter
  {\csname M@bb@4\endcsname}{\mathord}{\M@bb}{"1D7DC}
\expandafter\DeclareMathSymbol\expandafter
  {\csname M@bb@5\endcsname}{\mathord}{\M@bb}{"1D7DD}
\expandafter\DeclareMathSymbol\expandafter
  {\csname M@bb@6\endcsname}{\mathord}{\M@bb}{"1D7DE}
\expandafter\DeclareMathSymbol\expandafter
  {\csname M@bb@7\endcsname}{\mathord}{\M@bb}{"1D7DF}
\expandafter\DeclareMathSymbol\expandafter
  {\csname M@bb@8\endcsname}{\mathord}{\M@bb}{"1D7E0}
\expandafter\DeclareMathSymbol\expandafter
  {\csname M@bb@9\endcsname}{\mathord}{\M@bb}{"1D7E1}}
```

Set caligraphic letters.

```
\def\M@cal@set{%
  \edef\M@cal{M\@calshape\the\M@count}
  \DeclareMathSymbol{\M@cal@A}{\mathord}{\M@cal}{"1D49C}
  \DeclareMathSymbol{\M@cal@B}{\mathord}{\M@cal}{"212C}
  \DeclareMathSymbol{\M@cal@C}{\mathord}{\M@cal}{"1D49E}
  \DeclareMathSymbol{\M@cal@D}{\mathord}{\M@cal}{"1D49F}
  \DeclareMathSymbol{\M@cal@E}{\mathord}{\M@cal}{"2130}
  \DeclareMathSymbol{\M@cal@F}{\mathord}{\M@cal}{"2131}
  \DeclareMathSymbol{\M@cal@G}{\mathord}{\M@cal}{"1D4A2}
  \DeclareMathSymbol{\M@cal@H}{\mathord}{\M@cal}{"210B}
  \DeclareMathSymbol{\M@cal@I}{\mathord}{\M@cal}{"2110}
  \DeclareMathSymbol{\M@cal@J}{\mathord}{\M@cal}{"1D4A5}
  \DeclareMathSymbol{\M@cal@K}{\mathord}{\M@cal}{"1D4A6}
  \DeclareMathSymbol{\M@cal@L}{\mathord}{\M@cal}{"2112}
  \DeclareMathSymbol{\M@cal@M}{\mathord}{\M@cal}{"2133}
  \DeclareMathSymbol{\M@cal@N}{\mathord}{\M@cal}{"1D4A9}
  \DeclareMathSymbol{\M@cal@O}{\mathord}{\M@cal}{"1D4AA}
```

```
\DeclareMathSymbol{\M@cal@P}{\mathord}{\M@cal}{"1D4AB}
\DeclareMathSymbol{\M@cal@Q}{\mathord}{\M@cal}{"1D4AC}
\DeclareMathSymbol{\M@cal@R}{\mathord}{\M@cal}{"211B}
\DeclareMathSymbol{\M@cal@S}{\mathord}{\M@cal}{"1D4AE}
\DeclareMathSymbol{\M@cal@T}{\mathord}{\M@cal}{"1D4AF}
\DeclareMathSymbol{\M@cal@U}{\mathord}{\M@cal}{"1D4B0}
\DeclareMathSymbol{\M@cal@V}{\mathord}{\M@cal}{"1D4B1}
\DeclareMathSymbol{\M@cal@W}{\mathord}{\M@cal}{"1D4B2}
\DeclareMathSymbol{\M@cal@X}{\mathord}{\M@cal}{"1D4B3}
\DeclareMathSymbol{\M@cal@Y}{\mathord}{\M@cal}{"1D4B4}
\DeclareMathSymbol{\M@cal@Z}{\mathord}{\M@cal}{"1D4B5}
\DeclareMathSymbol{\M@cal@a}{\mathord}{\M@cal}{"1D4B6}
\DeclareMathSymbol{\M@cal@b}{\mathord}{\M@cal}{"1D4B7}
\DeclareMathSymbol{\M@cal@c}{\mathord}{\M@cal}{"1D4B8}
\DeclareMathSymbol{\M@cal@d}{\mathord}{\M@cal}{"1D4B9}
\DeclareMathSymbol{\M@cal@e}{\mathord}{\M@cal}{"212F}
\DeclareMathSymbol{\M@cal@f}{\mathord}{\M@cal}{"1D4BB}
\DeclareMathSymbol{\M@cal@g}{\mathord}{\M@cal}{"210A}
\DeclareMathSymbol{\M@cal@h}{\mathord}{\M@cal}{"1D4BD}
\DeclareMathSymbol{\M@cal@i}{\mathord}{\M@cal}{"1D4BE}
\DeclareMathSymbol{\M@cal@j}{\mathord}{\M@cal}{"1D4BF}
\DeclareMathSymbol{\M@cal@k}{\mathord}{\M@cal}{"1D4C0}
\DeclareMathSymbol{\M@cal@l}{\mathord}{\M@cal}{"1D4C1}
\DeclareMathSymbol{\M@cal@m}{\mathord}{\M@cal}{"1D4C2}
\DeclareMathSymbol{\M@cal@n}{\mathord}{\M@cal}{"1D4C3}
\DeclareMathSymbol{\M@cal@o}{\mathord}{\M@cal}{"2134}
\DeclareMathSymbol{\M@cal@p}{\mathord}{\M@cal}{"1D4C5}
\DeclareMathSymbol{\M@cal@q}{\mathord}{\M@cal}{"1D4C6}
\DeclareMathSymbol{\M@cal@r}{\mathord}{\M@cal}{"1D4C7}
\DeclareMathSymbol{\M@cal@s}{\mathord}{\M@cal}{"1D4C8}
\DeclareMathSymbol{\M@cal@t}{\mathord}{\M@cal}{"1D4C9}
\DeclareMathSymbol{\M@cal@u}{\mathord}{\M@cal}{"1D4CA}
\DeclareMathSymbol{\M@cal@v}{\mathord}{\M@cal}{"1D4CB}
\DeclareMathSymbol{\M@cal@w}{\mathord}{\M@cal}{"1D4CC}
\DeclareMathSymbol{\M@cal@x}{\mathord}{\M@cal}{"1D4CD}
\DeclareMathSymbol{\M@cal@y}{\mathord}{\M@cal}{"1D4CE}
\DeclareMathSymbol{\M@cal@z}{\mathord}{\M@cal}{"1D4CF}}
```

Set fraktur letters.

```
\def\M@frak@set{%
  \edef\M@frak{M\@frakshape\the\M@count}
  \DeclareMathSymbol{\M@frak@A}{\mathord}{\M@frak}{"1D504}
  \DeclareMathSymbol{\M@frak@B}{\mathord}{\M@frak}{"1D505}
  \DeclareMathSymbol{\M@frak@C}{\mathord}{\M@frak}{"212D}
  \DeclareMathSymbol{\M@frak@D}{\mathord}{\M@frak}{"1D507}
  \DeclareMathSymbol{\M@frak@E}{\mathord}{\M@frak}{"1D508}
  \DeclareMathSymbol{\M@frak@F}{\mathord}{\M@frak}{"1D509}
  \DeclareMathSymbol{\M@frak@G}{\mathord}{\M@frak}{"1D50A}
```

```
\DeclareMathSymbol{\M@frak@H}{\mathord}{\M@frak}{"210C}
\DeclareMathSymbol{\M@frak@I}{\mathord}{\M@frak}{"2111}
\DeclareMathSymbol{\M@frak@J}{\mathord}{\M@frak}{"1D50D}
\DeclareMathSymbol{\M@frak@K}{\mathord}{\M@frak}{"1D50E}
\DeclareMathSymbol{\M@frak@L}{\mathord}{\M@frak}{"1D50F}
\DeclareMathSymbol{\M@frak@M}{\mathord}{\M@frak}{"1D510}
\DeclareMathSymbol{\M@frak@N}{\mathord}{\M@frak}{"1D511}
\DeclareMathSymbol{\M@frak@O}{\mathord}{\M@frak}{"1D512}
\DeclareMathSymbol{\M@frak@P}{\mathord}{\M@frak}{"1D513}
\DeclareMathSymbol{\M@frak@Q}{\mathord}{\M@frak}{"1D514}
\DeclareMathSymbol{\M@frak@R}{\mathord}{\M@frak}{"212C}
\DeclareMathSymbol{\M@frak@S}{\mathord}{\M@frak}{"1D516}
\DeclareMathSymbol{\M@frak@T}{\mathord}{\M@frak}{"1D517}
\DeclareMathSymbol{\M@frak@U}{\mathord}{\M@frak}{"1D518}
\DeclareMathSymbol{\M@frak@V}{\mathord}{\M@frak}{"1D519}
\DeclareMathSymbol{\M@frak@W}{\mathord}{\M@frak}{"1D51A}
\DeclareMathSymbol{\M@frak@X}{\mathord}{\M@frak}{"1D51B}
\DeclareMathSymbol{\M@frak@Y}{\mathord}{\M@frak}{"1D51C}
\DeclareMathSymbol{\M@frak@Z}{\mathord}{\M@frak}{"2128}
\DeclareMathSymbol{\M@frak@a}{\mathord}{\M@frak}{"1D51E}
\DeclareMathSymbol{\M@frak@b}{\mathord}{\M@frak}{"1D51F}
\DeclareMathSymbol{\M@frak@c}{\mathord}{\M@frak}{"1D520}
\DeclareMathSymbol{\M@frak@d}{\mathord}{\M@frak}{"1D521}
\DeclareMathSymbol{\M@frak@e}{\mathord}{\M@frak}{"1D522}
\DeclareMathSymbol{\M@frak@f}{\mathord}{\M@frak}{"1D523}
\DeclareMathSymbol{\M@frak@g}{\mathord}{\M@frak}{"1D524}
\DeclareMathSymbol{\M@frak@h}{\mathord}{\M@frak}{"1D525}
\DeclareMathSymbol{\M@frak@i}{\mathord}{\M@frak}{"1D526}
\DeclareMathSymbol{\M@frak@j}{\mathord}{\M@frak}{"1D527}
\DeclareMathSymbol{\M@frak@k}{\mathord}{\M@frak}{"1D528}
\DeclareMathSymbol{\M@frak@l}{\mathord}{\M@frak}{"1D529}
\DeclareMathSymbol{\M@frak@m}{\mathord}{\M@frak}{"1D52A}
\DeclareMathSymbol{\M@frak@n}{\mathord}{\M@frak}{"1D52B}
\DeclareMathSymbol{\M@frak@o}{\mathord}{\M@frak}{"1D52C}
\DeclareMathSymbol{\M@frak@p}{\mathord}{\M@frak}{"1D52D}
\DeclareMathSymbol{\M@frak@q}{\mathord}{\M@frak}{"1D52E}
\DeclareMathSymbol{\M@frak@r}{\mathord}{\M@frak}{"1D52F}
\DeclareMathSymbol{\M@frak@s}{\mathord}{\M@frak}{"1D530}
\DeclareMathSymbol{\M@frak@t}{\mathord}{\M@frak}{"1D531}
\DeclareMathSymbol{\M@frak@u}{\mathord}{\M@frak}{"1D532}
\DeclareMathSymbol{\M@frak@v}{\mathord}{\M@frak}{"1D533}
\DeclareMathSymbol{\M@frak@w}{\mathord}{\M@frak}{"1D534}
\DeclareMathSymbol{\M@frak@x}{\mathord}{\M@frak}{"1D535}
\DeclareMathSymbol{\M@frak@y}{\mathord}{\M@frak}{"1D536}
\DeclareMathSymbol{\M@frak@z}{\mathord}{\M@frak}{"1D537}}
```

Set bold caligraphic letters.

```
\def\M@bcal@set{%
```

```
\edef\M@bcal{M\@bcalshape\the\M@count}
\DeclareMathSymbol{\M@bcal@A}{\mathord}{\M@bcal}{"1D4D0}
\DeclareMathSymbol{\M@bcal@B}{\mathord}{\M@bcal}{"1D4D1}
\DeclareMathSymbol{\M@bcal@C}{\mathord}{\M@bcal}{"1D4D2}
\DeclareMathSymbol{\M@bcal@D}{\mathord}{\M@bcal}{"1D4D3}
\DeclareMathSymbol{\M@bcal@E}{\mathord}{\M@bcal}{"1D4D4}
\DeclareMathSymbol{\M@bcal@F}{\mathord}{\M@bcal}{"1D4D5}
\DeclareMathSymbol{\M@bcal@G}{\mathord}{\M@bcal}{"1D4D6}
\DeclareMathSymbol{\M@bcal@H}{\mathord}{\M@bcal}{"1D4D7}
\DeclareMathSymbol{\M@bcal@I}{\mathord}{\M@bcal}{"1D4D8}
\DeclareMathSymbol{\M@bcal@J}{\mathord}{\M@bcal}{"1D4D9}
\DeclareMathSymbol{\M@bcal@K}{\mathord}{\M@bcal}{"1D4DA}
\DeclareMathSymbol{\M@bcal@L}{\mathord}{\M@bcal}{"1D4DB}
\DeclareMathSymbol{\M@bcal@M}{\mathord}{\M@bcal}{"1D4DC}
\DeclareMathSymbol{\M@bcal@N}{\mathord}{\M@bcal}{"1D4DD}
\DeclareMathSymbol{\M@bcal@O}{\mathord}{\M@bcal}{"1D4DE}
\DeclareMathSymbol{\M@bcal@P}{\mathord}{\M@bcal}{"1D4DF}
\DeclareMathSymbol{\M@bcal@Q}{\mathord}{\M@bcal}{"1D4E0}
\DeclareMathSymbol{\M@bcal@R}{\mathord}{\M@bcal}{"1D4E1}
\DeclareMathSymbol{\M@bcal@S}{\mathord}{\M@bcal}{"1D4E2}
\DeclareMathSymbol{\M@bcal@T}{\mathord}{\M@bcal}{"1D4E3}
\DeclareMathSymbol{\M@bcal@U}{\mathord}{\M@bcal}{"1D4E4}
\DeclareMathSymbol{\M@bcal@V}{\mathord}{\M@bcal}{"1D4E5}
\DeclareMathSymbol{\M@bcal@W}{\mathord}{\M@bcal}{"1D4E6}
\DeclareMathSymbol{\M@bcal@X}{\mathord}{\M@bcal}{"1D4E7}
\DeclareMathSymbol{\M@bcal@Y}{\mathord}{\M@bcal}{"1D4E8}
\DeclareMathSymbol{\M@bcal@Z}{\mathord}{\M@bcal}{"1D4E9}
\DeclareMathSymbol{\M@bcal@a}{\mathord}{\M@bcal}{"1D4EA}
\DeclareMathSymbol{\M@bcal@b}{\mathord}{\M@bcal}{"1D4EB}
\DeclareMathSymbol{\M@bcal@c}{\mathord}{\M@bcal}{"1D4EC}
\DeclareMathSymbol{\M@bcal@d}{\mathord}{\M@bcal}{"1D4ED}
\DeclareMathSymbol{\M@bcal@e}{\mathord}{\M@bcal}{"1D4EE}
\DeclareMathSymbol{\M@bcal@f}{\mathord}{\M@bcal}{"1D4EF}
\DeclareMathSymbol{\M@bcal@g}{\mathord}{\M@bcal}{"1D4F0}
\DeclareMathSymbol{\M@bcal@h}{\mathord}{\M@bcal}{"1D4F1}
\DeclareMathSymbol{\M@bcal@i}{\mathord}{\M@bcal}{"1D4F2}
\DeclareMathSymbol{\M@bcal@j}{\mathord}{\M@bcal}{"1D4F3}
\DeclareMathSymbol{\M@bcal@k}{\mathord}{\M@bcal}{"1D4F4}
\DeclareMathSymbol{\M@bcal@l}{\mathord}{\M@bcal}{"1D4F5}
\DeclareMathSymbol{\M@bcal@m}{\mathord}{\M@bcal}{"1D4F6}
\DeclareMathSymbol{\M@bcal@n}{\mathord}{\M@bcal}{"1D4F7}
\DeclareMathSymbol{\M@bcal@o}{\mathord}{\M@bcal}{"1D4F8}
\DeclareMathSymbol{\M@bcal@p}{\mathord}{\M@bcal}{"1D4F9}
\DeclareMathSymbol{\M@bcal@q}{\mathord}{\M@bcal}{"1D4FA}
\DeclareMathSymbol{\M@bcal@r}{\mathord}{\M@bcal}{"1D4FB}
\DeclareMathSymbol{\M@bcal@s}{\mathord}{\M@bcal}{"1D4FC}
\DeclareMathSymbol{\M@bcal@t}{\mathord}{\M@bcal}{"1D4FD}
```

```
  \DeclareMathSymbol{\M@bcal@u}{\mathord}{\M@bcal}{"1D4FE}
  \DeclareMathSymbol{\M@bcal@v}{\mathord}{\M@bcal}{"1D4FF}
  \DeclareMathSymbol{\M@bcal@w}{\mathord}{\M@bcal}{"1D500}
  \DeclareMathSymbol{\M@bcal@x}{\mathord}{\M@bcal}{"1D501}
  \DeclareMathSymbol{\M@bcal@y}{\mathord}{\M@bcal}{"1D502}
  \DeclareMathSymbol{\M@bcal@z}{\mathord}{\M@bcal}{"1D503}}
```

Set bold fraktur letters.

```
\def\M@bfrak@set{%
  \edef\M@bfrak{M\@bfrakshape\the\M@count}
  \DeclareMathSymbol{\M@bfrak@A}{\mathord}{\M@bfrak}{"1D56C}
  \DeclareMathSymbol{\M@bfrak@B}{\mathord}{\M@bfrak}{"1D56D}
  \DeclareMathSymbol{\M@bfrak@C}{\mathord}{\M@bfrak}{"1D56E}
  \DeclareMathSymbol{\M@bfrak@D}{\mathord}{\M@bfrak}{"1D56F}
  \DeclareMathSymbol{\M@bfrak@E}{\mathord}{\M@bfrak}{"1D570}
  \DeclareMathSymbol{\M@bfrak@F}{\mathord}{\M@bfrak}{"1D571}
  \DeclareMathSymbol{\M@bfrak@G}{\mathord}{\M@bfrak}{"1D572}
  \DeclareMathSymbol{\M@bfrak@H}{\mathord}{\M@bfrak}{"1D573}
  \DeclareMathSymbol{\M@bfrak@I}{\mathord}{\M@bfrak}{"1D574}
  \DeclareMathSymbol{\M@bfrak@J}{\mathord}{\M@bfrak}{"1D575}
  \DeclareMathSymbol{\M@bfrak@K}{\mathord}{\M@bfrak}{"1D576}
  \DeclareMathSymbol{\M@bfrak@L}{\mathord}{\M@bfrak}{"1D577}
  \DeclareMathSymbol{\M@bfrak@M}{\mathord}{\M@bfrak}{"1D578}
  \DeclareMathSymbol{\M@bfrak@N}{\mathord}{\M@bfrak}{"1D579}
  \DeclareMathSymbol{\M@bfrak@O}{\mathord}{\M@bfrak}{"1D57A}
  \DeclareMathSymbol{\M@bfrak@P}{\mathord}{\M@bfrak}{"1D57B}
  \DeclareMathSymbol{\M@bfrak@Q}{\mathord}{\M@bfrak}{"1D57C}
  \DeclareMathSymbol{\M@bfrak@R}{\mathord}{\M@bfrak}{"1D57D}
  \DeclareMathSymbol{\M@bfrak@S}{\mathord}{\M@bfrak}{"1D57E}
  \DeclareMathSymbol{\M@bfrak@T}{\mathord}{\M@bfrak}{"1D57F}
  \DeclareMathSymbol{\M@bfrak@U}{\mathord}{\M@bfrak}{"1D580}
  \DeclareMathSymbol{\M@bfrak@V}{\mathord}{\M@bfrak}{"1D581}
  \DeclareMathSymbol{\M@bfrak@W}{\mathord}{\M@bfrak}{"1D582}
  \DeclareMathSymbol{\M@bfrak@X}{\mathord}{\M@bfrak}{"1D583}
  \DeclareMathSymbol{\M@bfrak@Y}{\mathord}{\M@bfrak}{"1D584}
  \DeclareMathSymbol{\M@bfrak@Z}{\mathord}{\M@bfrak}{"1D585}
  \DeclareMathSymbol{\M@bfrak@a}{\mathord}{\M@bfrak}{"1D586}
  \DeclareMathSymbol{\M@bfrak@b}{\mathord}{\M@bfrak}{"1D587}
  \DeclareMathSymbol{\M@bfrak@c}{\mathord}{\M@bfrak}{"1D588}
  \DeclareMathSymbol{\M@bfrak@d}{\mathord}{\M@bfrak}{"1D589}
  \DeclareMathSymbol{\M@bfrak@e}{\mathord}{\M@bfrak}{"1D58A}
  \DeclareMathSymbol{\M@bfrak@f}{\mathord}{\M@bfrak}{"1D58B}
  \DeclareMathSymbol{\M@bfrak@g}{\mathord}{\M@bfrak}{"1D58C}
  \DeclareMathSymbol{\M@bfrak@h}{\mathord}{\M@bfrak}{"1D58D}
  \DeclareMathSymbol{\M@bfrak@i}{\mathord}{\M@bfrak}{"1D58E}
  \DeclareMathSymbol{\M@bfrak@j}{\mathord}{\M@bfrak}{"1D58F}
  \DeclareMathSymbol{\M@bfrak@k}{\mathord}{\M@bfrak}{"1D590}
  \DeclareMathSymbol{\M@bfrak@l}{\mathord}{\M@bfrak}{"1D591}
```

```
\DeclareMathSymbol{\M@bfrak@m}{\mathord}{\M@bfrak}{"1D592}
\DeclareMathSymbol{\M@bfrak@n}{\mathord}{\M@bfrak}{"1D593}
\DeclareMathSymbol{\M@bfrak@o}{\mathord}{\M@bfrak}{"1D594}
\DeclareMathSymbol{\M@bfrak@p}{\mathord}{\M@bfrak}{"1D595}
\DeclareMathSymbol{\M@bfrak@q}{\mathord}{\M@bfrak}{"1D596}
\DeclareMathSymbol{\M@bfrak@r}{\mathord}{\M@bfrak}{"1D597}
\DeclareMathSymbol{\M@bfrak@s}{\mathord}{\M@bfrak}{"1D598}
\DeclareMathSymbol{\M@bfrak@t}{\mathord}{\M@bfrak}{"1D599}
\DeclareMathSymbol{\M@bfrak@u}{\mathord}{\M@bfrak}{"1D59A}
\DeclareMathSymbol{\M@bfrak@v}{\mathord}{\M@bfrak}{"1D59B}
\DeclareMathSymbol{\M@bfrak@w}{\mathord}{\M@bfrak}{"1D59C}
\DeclareMathSymbol{\M@bfrak@x}{\mathord}{\M@bfrak}{"1D59D}
\DeclareMathSymbol{\M@bfrak@y}{\mathord}{\M@bfrak}{"1D59E}
\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)
–iternal 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.

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