```
\alpha
                         \theta
                                                               \tau
     \beta
                         \vartheta
                                             \pi
                                                               \upsilon
                                       \pi
     \gamma
                          \iota
                                             \varpi
                                                               \phi
                     \iota
                                        \varpi
\dot{\delta}
     \delta
                          \kappa
                                             \rho
                                                               \varphi
                     \kappa
                                        \rho
                                                               \chi
\epsilon
     \epsilon
                          \lambda
                                             \varrho
                                        \varrho
                                                           \chi
ε
     \varepsilon
                          \mu
                                             \sigma
                                                               \psi
                     \mu
                                        \sigma
                                                           \psi
\zeta
                                             \varsigma
     \zeta
                     \nu
                          \nu
                                                               \omega
     \eta
                     ξ
                          \xi
Γ
                                        \sum
     \Gamma
                     Λ
                          \Lambda
                                             \Sigma
                                                               \Psi
                                        Υ
                                             \Upsilon
Δ
     \Delta
                     Ξ
                         \Xi
                                                           \Omega
                                                               \Omega
Θ
     \Theta
                     Π
                         \Pi
                                             \Phi
```

Table 1: Greek Letters

$\pm$	\pm	$\cap$	\cap	$\Diamond$	\diamond	$\oplus$	\oplus
<b>Ŧ</b>	\mp	$\cup$	\cup	Δ	$\$ bigtriangleup	$\ominus$	\ominus
×	\times	$\forall$	\uplus	$\nabla$	\bigtriangledown	$\otimes$	\otimes
÷	\div	П	\sqcap	$\triangleleft$	$\triangleleft$	$\oslash$	\oslash
*	\ast	$\sqcup$	\sqcup	$\triangleright$	$\triangleright$	$\odot$	\odot
*	\star	$\vee$	\vee	$\triangleleft$	$\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ $	$\bigcirc$	\bigcirc
0	\circ	$\wedge$	\wedge	$\triangleright$	\rhd*	†	\dagger
•	\bullet	\	\setminus	$\leq$	$\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ $	‡	\ddagger
•	\cdot	?	\wr	$\geq$	$\unrhd^*$	П	$\aggreen$ amalg
1	_		_				

<sup>\*</sup> Not predefined in LATEX  $2_{\varepsilon}$ . Use one of the packages latexsym, amsfonts or amssymb.

Table 2: Binary Operation Symbols

$\leq$	\leq	$\geq$	\geq	=	\equiv	$\models$	\models
$\prec$	\prec	$\succ$	\succ	$\sim$	\sim	$\perp$	\perp
$\preceq$	\preceq	$\succeq$	\succeq	$\simeq$	\simeq		\mid
«	\11	$\gg$	\gg	$\asymp$	$\asymp$	İ	\parallel
$\subset$	\subset	$\supset$	\supset	$\approx$	\approx	$\bowtie$	\bowtie
$\subseteq$	\subseteq	$\supseteq$	\supseteq	$\cong$	\cong	$\bowtie$	$\Join^*$
	$\sqsubset^*$		$\sqsupset^*$	$\neq$	\neq	$\smile$	\smile
	\sqsubseteq	$\supseteq$	\sqsupseteq	$\doteq$	\doteq	$\overline{}$	\frown
$\in$	\in	$\ni$	\ni	$\propto$	\propto	=	=
$\vdash$	\vdash	$\dashv$	\dashv	<	<	>	>

<sup>\*</sup> Not predefined in LATEX  $2\varepsilon$ . Use one of the packages latexsym, amsfonts or amssymb.

Table 3: Relation Symbols

, , ; ; : \colon . \ldotp · \cdotp

Table 4: Punctuation Symbols

$\leftarrow$	\leftarrow	$\leftarrow$	$\label{longleftarrow}$	1	\uparrow
$\Leftarrow$	\Leftarrow	$\Leftarrow$	$\Longleftarrow$	$\uparrow$	\Uparrow
$\longrightarrow$	\rightarrow	$\longrightarrow$	$\label{longright} \$	$\downarrow$	\downarrow
$\Rightarrow$	\Rightarrow	$\Longrightarrow$	$\Longrightarrow$	$\Downarrow$	\Downarrow
$\longleftrightarrow$	$\$ leftrightarrow	$\longleftrightarrow$	\longleftrightarrow	$\uparrow$	\updownarrow
$\Leftrightarrow$	$\Leftrightarrow$	$\iff$	$\Longleftrightarrow$	<b>\$</b>	\Updownarrow
$\longmapsto$	\mapsto	$\longmapsto$	$\label{longmapsto} \$	7	\nearrow
$\leftarrow$	\hookleftarrow	$\hookrightarrow$	\hookrightarrow	\	\searrow
_	\leftharpoonup	$\rightarrow$	\rightharpoonup	/	\swarrow
$\overline{}$	\leftharpoondown	$\rightarrow$	$\$ rightharpoondown		\nwarrow
$\rightleftharpoons$	\rightleftharpoons	$\sim$	$\label{leadsto} \$		

<sup>\*</sup> Not predefined in LATEX  $2\varepsilon$ . Use one of the packages latexsym, amsfonts or amssymb.

Table 5: Arrow Symbols

	\ldots		\cdots	:	\vdots	٠.	\ddots
×	\aleph	1	\prime	$\forall$	\forall	$\infty$	$\$ infty
$\hbar$	\hbar	Ø	\emptyset	$\exists$	\exists		$\Box^*$
$\imath$	$\$ imath	$\nabla$	\nabla	$\neg$	\neg	$\Diamond$	$\operatorname{\begin{tabular}{l} Diamond^* \end{tabular}}$
J	$\$ jmath	$\sqrt{}$	\surd	þ	\flat	$\triangle$	\triangle
$\ell$	\ell	Т	\top	þ	\natural	*	\clubsuit
Ø	\wp	$\perp$	\bot	#	\sharp	$\Diamond$	\diamondsuit
$\Re$	\Re		<b>\</b> I	\	\backslash	$\Diamond$	\heartsuit
$\Im$	\Im	_	\angle	$\partial$	\partial	$\spadesuit$	\spadesuit
Ω	$\mbox{\mbo}$				1		

<sup>\*</sup> Not predefined in LATEX  $2\varepsilon$ . Use one of the packages latexsym, amsfonts or amssymb.

Table 6: Miscellaneous Symbols

$\sum$	\sum	$\cap$	\bigcap	$\odot$	\bigodot
$\prod$	\prod	U	\bigcup	$\otimes$	\bigotimes
$\prod$	\coprod		\bigsqcup	$\oplus$	\bigoplus
$\overline{\int}$	$\$ int	V	\bigvee	+	\biguplus
∮	\oint	Λ	\bigwedge		

Table 7: Variable-sized Symbols

\arccos	\cos	\csc	\exp	\ker	$\label{limsup}$	$\mbox{min}$	\sinh
\arcsin	\cosh	\deg	\gcd	\lg	$\ln$	\Pr	\sup
\arctan	\cot	\det	$\hom$	$\label{lim}$	\log	\sec	an
\arg	\coth	\dim	$\$ inf	\liminf	$\max$	\sin	\tanh

Table 8: Log-like Symbols

Table 9: Delimiters

```
\lmoustache
                     \rmoustache
                                                                \rgroup
                                                                                    \lgroup
                     \arrowvert
                                          \Arrowvert
                                                                \bracevert
                                        Table 10: Large Delimiters
            \hat{a}
                \hat{a}
                              \acute{a}
                                  \acute{a}
                                                \bar{a}
                                                    \bar{a}
                                                                \dot{a}
                                                                    \dot{a}
                                                                                 \check{a}
                                                                                     \breve{a}
                \check{a}
                                  \grave{a}
                                                \vec{a}
                                                    \sqrt{a}
                                                                \ddot{a}
                                                                    \ddot{a}
                                                                                     \tilde{a}
                              \grave{a}
                                                                                 \tilde{a}
                                       Table 11: Math mode accents
                    abc
                                                       \widehat{abc}
                                                               \widehat{abc}
                            \widetilde{abc}
                    \overline{abc}
                            \overleftarrow{abc}
                                                       \overrightarrow{abc}
                                                               \overrightarrow{abc}
                    \overline{abc}
                                                               \underline{abc}
                            \overline{abc}
                                                       \underline{abc}
                     abc
                            \overbrace{abc}
                                                       abc
                                                               \underbrace{abc}
                    \sqrt{abc}
                                                       \sqrt[n]{abc}
                            \sqrt{abc}
                                                               \sqrt[n]{abc}
                            f,
                                                               \frac{abc}{xyz}
                                    Table 12: Some other constructions
                       \ulcorner \urcorner \
                                                          \llcorner _
                                                                            \lrcorner
                                        Table 13: AMS Delimiters
\dashrightarrow
                                 \dashleftarrow
                                                           \rightleftharpoons
                                                                \leftleftarrows
                                                                                        \stackrel{\longleftarrow}{}
                                                                                              \leftrightarrows
                           ← – –
\Lleftarrow
                                                                                              \looparrowleft
                                  \twoheadleftarrow
                                                                \leftarrowtail
                                                                                        \leftarrow
\leftrightharpoons
                                  \curvearrowleft
                                                           Q
                                                                \circlearrowleft
                                                                                        ↰
                                                                                              \Lsh
\upuparrows
                                  \upharpoonleft
                                                           \downharpoonleft
                                                                                              \multimap
\leftrightsquigarrow
                                                           \stackrel{\longrightarrow}{}
                           \Rightarrow
                                  \rightrightarrows
                                                                \rightleftarrows
                                                                                        \Rightarrow
                                                                                              \rightrightarrows
\rightleftarrows
                                  \twoheadrightarrow
                                                                \rightarrowtail
                                                                                              \looparrowright
                                                           \longrightarrow
                                                                                        \rightarrow
\rightleftharpoons
                                  \curvearrowright
                                                           \bigcirc
                                                                \circlearrowright
                                                                                        \downarrow
                                                                                              \Rsh
\downdownarrows
                                  \upharpoonright
                                                                \downharpoonright
                                                                                              \rightsquigarrow
                                                           Table 14: AMS Arrows
                                      \nrightarrow
          \nleftarrow
                                                                  \nLeftarrow ⇒
                                                                                        \nRightarrow
          \nleftrightarrow
                                 ₩
                                      \nLeftrightarrow
                                     Table 15: AMS Negated Arrows
                                          \digamma ×
                                                          \varkappa
                                           Table 16: AMS Greek
```

-->

 $\Leftarrow$ 

=

 $\uparrow \uparrow$ 

 $\stackrel{\longrightarrow}{}$ 

 $\prod$ 

\beth 7 \daleth ] \gimel

Table 17: AMS Hebrew

```
\hbar
   \hbar
                  \hbar \hslash
                                       	riangle \vartriangle 	riangle
                                                            \triangledown
                  ♦ \lozenge
\square
                                        _
                                                            \angle
4
   \measuredangle # \nexists
                                        ∪ \mho
                                                         Ь
                                                            \Finv
G
   \Game
                  \Bbbk
                     \Bbbk
                                        1
                                            \backprime
                                                        ∅ \varnothing
   \blacktriangle
                     \blacktriangledown
                                       \blacksquare ♦
                                                            \blacklozenge
                  \blacksquare
                                        C
                     \sphericalangle
                                            \complement
   \bigstar
                                                        ð \eth
                  ⋖
                     \diagdown
   \diagup
```

Table 18: AMS Miscellaneous

$\dot{+}$	\dotplus	\	\smallsetminus	$\bigcap$	\Cap	U	\Cup
$\overline{\wedge}$	\barwedge	$\underline{\vee}$	\veebar	$\overline{\wedge}$	\doublebarwedge	$\Box$	\boxminus
$\boxtimes$	\boxtimes	•	\boxdot	$\blacksquare$	\boxplus	*	\divideontimes
$\bowtie$	\ltimes	$\bowtie$	\rtimes	$\rightarrow$	\leftthreetimes	$\angle$	\rightthreetimes
人	\curlywedge	Υ	\curlyvee	$\ominus$	\circleddash	*	\circledast
0	\circledcirc		\centerdot	Т	\intercal		

Table 19: AMS Binary Operators

$\leq$	\leqq	$\leq$	\leqslant	<	\eqslantless	$\lesssim$	\lesssim
≲	\lessapprox	$\approxeq$	\approxeq	<	\lessdot	<b>///</b>	\111
$\leq$	\lessgtr	$\leq$	\lesseqgtr	$\leq$	\lesseqqgtr	÷	\doteqdot
≓	\risingdotseq	=	\fallingdotseq	$\sim$	\backsim	$\leq$	\backsimeq
$\subseteq$	\subseteqq	€	\Subset		\sqsubset	$\preccurlyeq$	\preccurlyeq
$\Rightarrow$	\curlyeqprec	$\preceq$	\precsim	$\approx$	\precapprox	$\triangleleft$	$\vartriangleleft$
$\leq$	\trianglelefteq	F	\vDash	Ϊŀ	\Vvdash	$\smile$	\smallsmile
$\overline{}$	\smallfrown	$\stackrel{\sim}{}$	\bumpeq	≎	\Bumpeq	$\geq$	\geqq
$\geqslant$	\geqslant	≽	\eqslantgtr	$\gtrsim$	\gtrsim	$\gtrapprox$	\gtrapprox
>	\gtrdot	<b>&gt;&gt;&gt;</b>	\ggg	$\geq$	\gtrless	\   \&\ \\	\gtreqless
$\geq$	\gtreqqless	-	\eqcirc	$\stackrel{\circ}{=}$	\circeq	$\triangleq$	$\triangleq$
$\sim$	\thicksim	$\approx$	\thickapprox	$\supseteq$	\supseteqq	∋	\Supset
$\Box$	\sqsupset	$\succcurlyeq$	\succcurlyeq	$\succ$	\curlyeqsucc	$\succeq$	\succsim
≅	\succapprox	$\triangleright$	$\vartriangleright$	$\trianglerighteq$	$\trianglerighteq$	$\vdash$	\Vdash
1	\shortmid	П	\shortparallel	Ŏ	\between	ф	\pitchfork
$\propto$	\varpropto	◀	$\blue{blacktriangleleft}$	<i>:</i> .	\therefore	Э	\backepsilon
<b>•</b>	\blacktriangleright	•:•	\because				

Table 20: AMS Binary Relations

K*V#K*DTP X*X.*X^1X X	<pre>\nless \lneq \lnapprox \precnapprox \nvdash \nsubseteq \varsubsetneqq \ngeqq \gnsim \nsucceq</pre>	*****	<pre>\nleq \lneqq \nprec \nsim \nvDash \subsetneq \ngtr \gneq \gnapprox \succnsim</pre>	*****	<pre>\nleqslant \lvertneqq \npreceq \nshortmid \ntriangleleft \varsubsetneq \ngeq \gneqq \nsucc \succnapprox</pre>	\$\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	<pre>\nleqq \lnsim \precnsim \nmid \ntrianglelefteq \subsetneqq \ngeqslant \gvertneqq \nsucceq \ncong</pre>
≱	\gnsim	æ	\gnapprox	7	\nsucc	$\not\succeq$	\nsucceq
<u>≠</u> н	\nsucceq \nshortparallel	<i></i> }	\succnsim \nparallel	<b>∤</b> ≋¥	\succnapprox \nvDash	≆ ⊭	\ncong \nVDash
 ≱	\ntriangleright \supsetneq	11 ≱ ⊋	\ntrianglerighteq \varsupsetneq	⊅ ≥	\nsupseteq \supsetneqq	₹	\nsupseteqq \varsupsetneqq

Table 21: AMS Negated Binary Relations

```
\llceil
                                        \prod
                                                              \llfloor
                                                                             \rrfloor
                                            \rrceil
                         \llbracket
                                           \rrbracket
                                        Table 22: stmaryrd Delimiters
     \Longmapsfrom
                               \Longmapsto
                                                       \Mapsfrom
                                                                                   \Mapsto
                         \Longrightarrow
     \nnearrow
                         1
                               \nnwarrow
                                                  1
                                                       \ssearrow
                                                                                   \sswarrow
     \shortdownarrow
                               \shortuparrow
                                                       \shortleftarrow
                                                                                   \shortrightarrow
                         1
     \longmapsfrom
                               \mapsfrom
                                                       \leftarrowtriangle
                                                                                   \rightarrowtriangle
                         \leftarrow
                                                  4—
     \lightning
                               \rrparenthesis
                                                       \leftrightarroweq
                                                                                   \leftrightarrowtriangle
                                                 \Leftrightarrow
                                         Table 23: stmaryrd Arrows
                                               \Mapsfromchar | \Mapstochar
                             / \arrownot +
                                               \mapsfromchar
                                  Table 24: stmaryrd Extension Characters
    \Ydown
                                \Yleft
                                                         \Yright
                                                                                   \downarrow
                                                                                        \Yup
                           \\
    \baro
                                \bbslash
                                                         \binampersand
                                                                                   8
                                                                                        \bindnasrepma
                                                     &
Φ
    \boxast
                                \boxbar
                                                                                        \boxbslash
*
                           \boxbox
                                                                                   0
    \boxcircle
                           •
                                \boxdot
                                                     \boxempty
                                                                                   \boxslash
Y
    \curlyveedownarrow
                           \gamma
                                \curlyveeuparrow
                                                         \curlywedgedownarrow
                                                                                   Ţ
                                                                                        \curlywedgeuparrow
                                                     \bigvee
\fatslash
                                                                                   \interleave
   \fatbslash
                                \fatsemi
                           °
                           M
   \leftslice
                                                         \minuso
                                                                                       \moo
\Diamond
                               \merge
                                                     \ominus
   \nplus
                           \bigcirc
                               \obar
                                                     \oblong
                                                                                   \bigcirc
                                                                                       \obslash
\bigcirc
   \ogreaterthan
                           \bigcirc
                               \olessthan
                                                     ( )
                                                         \ovee
                                                                                   \wedge
                                                                                       \owedge
    \rightslice
                               \sslash
                                                     \talloblong
                                                                                   \bigcirc
                                                                                       \varbigcirc
\Diamond
                                \varcurlywedge
Υ
    \varcurlyvee
                           \downarrow
                                                     *
                                                         \varoast
                                                                                   \oplus
                                                                                        \varobar
    \varobslash
                                \varocircle
                                                         \varodot
                                                                                   \bigcirc
                                                                                        \varogreaterthan
\Diamond
                           0
                                                     \odot
    \varolessthan
                           \ominus
                               \varominus
                                                         \varoplus
                                                                                        \varoslash
0
                                                     \oplus
                                                                                   0
                                                                                   Χ
                                                                                        \vartimes
\otimes
   \varotimes
                           \bigcirc
                               \varovee
                                                     \Diamond
                                                         \varowedge
                                    Table 25: stmaryrd Binary Operators
                        \bigbox
                                               \bigcurlyvee
                                                                         \bigcurlywedge
                        \biginterleave
                                                                         \bigparallel
                                               \bignplus
                        \bigsqcap
                                               \bigtriangledown
                                                                        \bigtriangleup
                                 Table 26: stmaryrd Large Binary Operators
        \inplus
                            \niplus
                                                  \subsetplus
                                                                            \oplus
                                                                                \subsetpluseq
    \oplus
                                              \oplus
                            \slashsupsetpluseq \leqslant
                                                  \trianglelefteqslant
                                                                                \trianglerighteqslant
        \supsetplus
                       \equiv
                                                                           \triangleright
                                     Table 27: stmaryrd Binary Relations
                            \ntrianglelefteqslant ≱
                                                          \ntrianglerighteqslant
                                Table 28: stmaryrd Negated Binary Relations
```

\Lbag

\Rbag

\lbag

\rbag

5

## Required package

\mathrm{ABCdef}	
\mathit{ABCdef}	
\mathnormal{ABCdef}	
\mathcal{ABC}	
\mathcal{ABC}	euscript with option: mathcal
\mathscr{ABC}	euscript with option: mather
<pre>\mathfrak{ABCdef}</pre>	eufrak
\mathbb{ABC}	amsfonts or amssymb
	<pre>\mathit{ABCdef} \mathnormal{ABCdef} \mathcal{ABC} \mathcal{ABC} \mathscr{ABC} \mathscr{ABC} \mathfrak{ABCdef}</pre>

Table 29: Math Alphabets