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

Table 1: Greek Letters

\pm	\pm	\cap	\cap	\Diamond	\diamond	\oplus	\oplus
Ŧ	\mp	\cup	\cup	Δ	\bigtriangleup	\ominus	\ominus
\times	\times	\forall	\uplus	∇	\bigtriangledown	\otimes	\otimes
÷	\div	П	\sqcap	◁	\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	\amalg
1	_		_				

^{*} Not predefined in LATEX 2_{ε} . Use one of the packages latexsym, amsfonts or amssymb.

Table 2: Binary Operation Symbols

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

^{*} Not predefined in LATEX 2_{ε} . Use one of the packages latexsym, amsfonts or amssymb.

Table 3: Relation Symbols

, , ; ; : \colon . \ldotp \cdot \cdotp

Table 4: Punctuation Symbols

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

^{*} Not predefined in LaTeX 2ε . Use one of the packages latexsym, amsfonts or amssymb.

Table 5: Arrow Symbols

	\ldots		\cdots	:	\vdots	٠.	\ddots
×	\aleph	1	\prime	\forall	\forall	∞	\infty
\hbar	\hbar	Ø	\emptyset	\exists	\exists		Nox^*
\imath	$\$ imath	∇	\nabla	\neg	\neg	\Diamond	\Diamond^*
\jmath	$\$ jmath	$\sqrt{}$	\surd	b	\flat	\triangle	$\$ triangle
ℓ	\ell	Τ	\top	þ	\natural	4	\clubsuit
80	\wp	\perp	\bot	#	\sharp	\Diamond	\diamondsuit
\Re	\Re		\1	\	\backslash	\Diamond	\heartsuit
\Im	\Im	_	\angle	∂	\partial		\spadesuit
Ω	$\mbox{\mbo}^*$				1		

^{*} Not predefined in LATEX $2_{\mathcal{E}}$. 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
\coprod	\coprod		\bigsqcup	\oplus	\bigoplus
ſ	$\$ int	V	\bigvee	+	\biguplus
∮	\oint	\wedge	\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	\mbox{hom}	$\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ $	\log	\sec	an
\arg	\coth	\dim	$\$ inf	\liminf	\max	\sin	\tanh

Table 8: Log-like Symbols

Table 9: Delimiters

```
\lmoustache
                                                                                          \lgroup
                      \rmoustache
                                                                    \rgroup
                      \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}
                                                                                           \tilde{a}
                                \grave{a}
                                                                    \ddot{a}
                                                                                      \tilde{a}
                                         Table 11: Math mode accents
                      abc
                                                          \widehat{abc}
                              \widetilde{abc}
                                                                    \widehat{abc}
                      \overline{abc}
                              \overleftarrow{abc}
                                                          \overrightarrow{abc}
                                                                    \overrightarrow{abc}
                      \overline{abc}
                              \overline{abc}
                                                          \underline{abc}
                                                                    \underline{abc}
                      abc
                              \overbrace{abc}
                                                           abc
                                                                    \underbrace{abc}
                      \sqrt{abc}
                                                           \sqrt[n]{abc}
                              \sqrt{abc}
                                                                    \sqrt[n]{abc}
                                                           \frac{abc}{xyz}
                              f,
                                                                    \frac{abc}{xyz}
                                      Table 12: Some other constructions
                                       ¬ \urcorner ∟
                                                               \llcorner
                         \ulcorner
                                                                                   \lrcorner
                                           Table 13: AMS Delimiters
\dashrightarrow
                                                                     \leftleftarrows
                                    \dashleftarrow
                                                               \rightleftharpoons
                                                                                              \stackrel{\longleftarrow}{\longrightarrow}
                                                                                                    \leftrightarrows
                             ← – –
                                                                                                    \looparrowleft
\Lleftarrow
                                    \twoheadleftarrow
                                                                     \leftarrowtail
                                                                                               \leftarrow
\leftrightharpoons
                                    \curvearrowleft
                                                               Q
                                                                     \circlearrowleft
                                                                                               ^{\dagger}
                                                                                                    \Lsh
\upuparrows
                                                                     \downharpoonleft
                                                                                                    \multimap
                                    \upharpoonleft
                                                               .
                                                                                              _
\leftrightsquigarrow
                                    \rightrightarrows
                                                               \stackrel{\longrightarrow}{\longleftrightarrow}
                                                                     \rightleftarrows
                             \Rightarrow
                                                                                              \Rightarrow
                                                                                                    \rightrightarrows
\rightleftarrows
                                    \twoheadrightarrow
                                                                     \rightarrowtail
                                                                                                    \looparrowright
                                                                                              \rightarrow

ho
\rightleftharpoons
                                    \curvearrowright
                                                               \bigcirc
                                                                     \circlearrowright
                                                                                                    \Rsh
\downdownarrows
                                    \upharpoonright
                                                                     \downharpoonright
                                                                                                    \rightsquigarrow
                                                               \rightsquigarrow
                                             Table 14: AMS Arrows
                                         \nrightarrow
                                                                                              \nRightarrow
           \nleftarrow
                                                                       \nLeftarrow ⇒
           \nleftrightarrow
                                   \Leftrightarrow
                                         \nLeftrightarrow
                                        Table 15: AMS Negated Arrows
                                             \digamma
                                                          \varkappa
                                                               \varkappa
                                             Table 16: AMS Greek
```

--→

 \Leftarrow

=

 \prod

 $\stackrel{\longrightarrow}{}$

 \coprod

Table 17: AMS Hebrew

¬ \daleth → \gimel

\beth

```
\hbar
    \hbar
                      \hbar
                         \hslash
                                                    \vartriangle
                                                                       \triangledown
                                                                   \nabla
                      \Diamond
\square
                         \lozenge
                                                \odot
                                                    \circledS
                                                                   _
                                                                       \angle
                     ∄
4
    \measuredangle
                         \nexists
                                                \Omega
                                                    \mbox{mho}
                                                                   \exists
                                                                       \Finv
G
                          \Bbbk
    \Game
                      k
                                                ١
                                                    \backprime
                                                                   Ø
                                                                       \varnothing
    \blacktriangle
                          \blacktriangledown
                                                \blacksquare
                                                                   ♦
                                                                       \blacklozenge
                                                С
    \bigstar
                          \sphericalangle
                                                    \complement
                                                                   ð
                                                                       \eth
                      ⋖
    \diagup
                          \diagdown
```

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
\ltimes	\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	\cong	\approxeq	<	\lessdot	~	\111
\leq	\lessgtr	\leq	\lesseqgtr	\leq	\lesseqqgtr	÷	\doteqdot
≓	\risingdotseq	≒.	\fallingdotseq	\sim	\backsim	\simeq	\backsimeq
\subseteq	\subseteqq	€	\Subset		\sqsubset	\preccurlyeq	\preccurlyeq
\Rightarrow	\curlyeqprec	\preceq	\precsim	\approx	\precapprox	\triangleleft	\vartriangleleft
\leq	\trianglelefteq	F	\vDash	$\parallel \vdash$	\Vvdash	$\overline{}$	\smallsmile
$\overline{}$	\smallfrown	<u>~</u>	\bumpeq	≎	\Bumpeq	\geq	\geqq
\geqslant	\geqslant	≽	\eqslantgtr	\gtrsim	\gtrsim	\gtrapprox	\gtrapprox
>	\gtrdot	>>>	\ggg	\geq	\gtrless	^ ^&∧ ∨⊴	\gtreqless
\geq	\gtreqqless		\eqcirc	$\stackrel{\circ}{=}$	\circeq	\triangleq	\triangleq
\sim	\thicksim	\approx	\thickapprox	\supseteq	\supseteqq	∋	\Supset
	\sqsupset	\succcurlyeq	\succcurlyeq	\succ	\curlyeqsucc	\sim	\succsim
X	\succapprox	\triangleright	\vartriangleright	\trianglerighteq	\trianglerighteq	⊩	\Vdash
1	\shortmid	П	\shortparallel	Ŏ	\between	ф	\pitchfork
\propto	\varpropto	◀	$\blue{blacktriangleleft}$	··.	\therefore	Э	\backepsilon
•	\blacktriangleright	•.•	\because				

Table 20: AMS Binary Relations

4	\ 7	Į.	\ 7	Į.	\	1	\ 7
\checkmark	\nless	≱	\nleq	≉	\nleqslant	≱	\nleqq
\leq	\lneq	≨	\label{lneqq}	\leq	$lem:lemma_lemma$	\lesssim	\label{lnsim}
≨	$\label{lnapprox}$	\prec	\nprec	$\not \preceq$	\npreceq	$\stackrel{\prec}{\sim}$	\precnsim
¥X#\	\precnapprox	\nsim	\n	ł	\nshortmid	1	\nmid
¥	\nvdash	$\not\models$	\nvDash	ot	\ntriangleleft	⊉	\n
⊈	\nsubseteq	\subsetneq	\subsetneq	\neq	\varsubsetneq	\subseteq	\subsetneqq
\neq	\varsubsetneqq	\nearrow	\ngtr	≱	\ngeq	¥	\ngeqslant
≱	\ngeqq	\geq	\gneq	\geq	\gneqq	\geq	\gvertneqq
\gtrsim	\gnsim	⋧	\gnapprox	$\not\succ$	\nsucc	$\not\succeq$	\nsucceq
$\not\succeq$	\nsucceq	≻,	\succnsim	,	\succnapprox	\ncong	\ncong
Ħ	\nshortparallel	$ mathred{H} $	nparallel	¥	\nvDash	¥	\nVDash
$\not\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!$	\ntriangleright	⊭	\n	⊉	\nsupseteq	$\not\supseteq$	\nsupseteqq
\supseteq	\supsetneq	\supseteq	\varsupsetneq	\supseteq	\supsetneqq	\supseteq	$\var{supsetneqq}$

Table 21: AMS Negated Binary Relations

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

\Lbag

\Rbag

\lbag

\rbag

5

Table 28: stmaryrd Negated Binary Relations

Required package

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

Table 29: Math Alphabets