

TXFONTS

Emre Sermutlu

Introduction

TEXT

MATH

Common

Greek

Binary

Subsets

Inequalities

Triangles

Arrows

Operators

Functions

Miscel.

Alphabet

Brackets

Dots

Var. Size

EXTRA

Txfonts

Textcomp

Marvosym

Pifont

Chemarrow

Txfonts Version of L^AT_EX and A_MS-L^AT_EX Symbols

Emre Sermutlu

March 18, 2008

Introduction I

About This Document

- This document lists symbols in standard L^AT_EX, *AMS-L^AT_EX* and a few additional packages.
- The document is optimized for viewing on a computer. I recommend using it full screen (Ctrl+L for Acrobat) and then navigating by clicking the sidebar.
- **This document uses the `Txfonts` package, which redefines many symbols.** There's another, standard version.
- You may reach the latest version of both files at academic.cankaya.edu.tr/~sermutlu.

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TXFONTS

Emre Sermutlu

Introduction

TEXT

MATH

Common

Greek

Binary

Subsets

Inequalities

Triangles

Arrows

Operators

Functions

Miscel.

Alphabet

Brackets

Dots

Var. Size

EXTRA

Txfonts

Textcomp

Marvosym

Pifont

Chemarrow

Introduction II

Note About Packages

TXFONTS

Emre Sermutlu

Introduction

TEXT

MATH

Common

Greek

Binary

Subsets

Inequalities

Triangles

Arrows

Operators

Functions

Miscel.

Alphabet

Brackets

Dots

Var. Size

EXTRA

Txfonts

Textcomp

Marvosym

Pifont

Chemarrow

- I did not separate the the $\mathcal{A}\mathcal{M}\mathcal{S}$ - \LaTeX symbols from the standard ones. Do not forget the include `\usepackage{txfonts}` before `\begin{document}` to be able to use these symbols.
- In the section Extra, I have included the packages `Textcomp`, `Marvosym`, `Pifont` and `Chemarrow` to give a taste of the rich world of \LaTeX . You need to install packages and then write `\usepackage{packagename}` to access these symbols. (If you are using MiK \TeX , it will install packages automatically at first usage.)
- There are many more packages and thousands of symbols not included here. I recommend Scott Pakin's **The Comprehensive \LaTeX Symbol List** for a complete listing. (It can be reached at www.ctan.org).

Introduction III

About the Author

TXFONTS

Emre Sermutlu

Introduction

TEXT

MATH

Common

Greek

Binary

Subsets

Inequalities

Triangles

Arrows

Operators

Functions

Miscel.

Alphabet

Brackets

Dots

Var. Size

EXTRA

Txfonts

Textcomp

Marvosym

Pifont

Chemarrow

- Prepared by Dr. Emre Sermutlu, Department of Mathematics and Computer Science, Çankaya University, Ankara-Turkey.
- I started this project for my personal needs, as it was unfeasible to browse books or search the internet every time I needed an unfamiliar symbol. I am using a computer whenever I am using L^AT_EX, so I needed a file optimized for viewing on screen, not printing on paper.
- I am a fan of Beamer, which is a wonderful class for preparing Power-Point like presentations in L^AT_EX. You are currently seeing the power of Beamer. You can learn more about it at: <http://latex-beamer.sourceforge.net>
- Please report errors, omissions, suggestions and any other kind of feedback to sermutlu@cankaya.edu.tr.

TEXT Symbols I

TXFONTS

Emre Sermutlu

Introduction

TEXT

MATH

Common

Greek

Binary

Subsets

Inequalities

Triangles

Arrows

Operators

Functions

Miscel.

Alphabet

Brackets

Dots

Var. Size

EXTRA

Txfonts

Textcomp

Marvosym

Pifont

Chemarrow

\$	\\$	Ü	\\"{U}	©	\copyright
&	\&	İ	\.{I}	®	\circledR
#	\#	Ğ	\~{G}	ⓐ	\textcircled{a}
%	\%	Ã	\H{A}	™	\texttrademark
{	\{	Ò	\`{O}	✓	\checkmark
}	\}	Ĉ	\^{C}	£	\pounds
	\-	�	\v{C}	✖	\maltese
¶	\P	�	\r{T}	•	\textbullet
§	\S	�	\'{P}	\	\textbackslash
†	\dag	�	\u{M}		\textbar
‡	\ddag	�	\={N}	-	_
i	\i	�	\b{E}	–	\textendash
j	\j	�	\c{S}	—	\textemdash
BB	\t{BB}	�	\d{F}	<	\textless
				>	\textgreater

TEXT Symbols II

TXFONTS

Emre Sermutlu

Introduction

TEXT

MATH

Common

Greek

Binary

Subsets

Inequalities

Triangles

Arrows

Operators

Functions

Miscel.

Alphabet

Brackets

Dots

Var. Size

EXTRA

Txfonts

Textcomp

Marvosym

Pifont

Chemarrow

...	\dots	~	\textasciitilde
ł	\l	^	\textasciicircum
Ł	\L	¡	\textexclamdown
ø	\o	¿	\textquestiondown
Ø	\O	‘	\textquotefirst
å	\aa	’	\textquoteright
Å	\AA	“	\textquotedblleft
ß	\ss	”	\textquotedblright
SS	\SS	„	\textvisiblespace
æ	\ae	º	\textordmasculine
Æ	\AE	ª	\textordfeminine
œ	\oe	٭	\textasteriskcentered
Œ	\OE	٭	\textperiodcentered

Common Math Symbols

Some of these symbols may appear at other tables for user convenience

TXFONTS

Emre Sermutlu

Introduction

TEXT

MATH

Common

Greek

Binary

Subsets

Inequalities

Triangles

Arrows

Operators

Functions

Miscel.

Alphabet

Brackets

Dots

Var. Size

EXTRA

Txfonts

Textcomp

Marvosym

Pifont

Chemarrow

\neq	<code>\neq</code>	\pm	<code>\pm</code>	\rightarrow	<code>\to</code>
\leqslant	<code>\leqslant</code>	\mp	<code>\mp</code>	\iff	<code>\iff</code>
\geqslant	<code>\geqslant</code>	\times	<code>\times</code>	$\$$	<code>\\$</code>
\approx	<code>\approx</code>	\div	<code>\div</code>	\pounds	<code>\pounds</code>
\equiv	<code>\equiv</code>	\cup	<code>\cup</code>	$\%$	<code>\%</code>
\cong	<code>\cong</code>	\cap	<code>\cap</code>	$\&$	<code>\&</code>
\simeq	<code>\simeq</code>	\in	<code>\in</code>	$\{$	<code>\{</code>
∂	<code>\partial</code>	\notin	<code>\not\in</code>	$\}$	<code>\}</code>
∞	<code>\infty</code>	\setminus	<code>\setminus</code>	$_$	<code>_</code>
∇	<code>\nabla</code>	\varnothing	<code>\varnothing</code>	\P	<code>\P</code>
\aleph	<code>\aleph</code>	\subset	<code>\subset</code>	\S	<code>\S</code>
ℓ	<code>\ell</code>	\supset	<code>\supset</code>	$*$	<code>\ast</code>
\vee	<code>\vee</code>	\cdot	<code>\cdot</code>	\dag	<code>\dag</code>
\wedge	<code>\wedge</code>	\centerdot	<code>\centerdot</code>	\ddag	<code>\ddag</code>
\forall	<code>\forall</code>	\circledC	<code>\copyright</code>	\bullet	<code>\bullet</code>
\exists	<code>\exists</code>	\maltese	<code>\maltese</code>	\wr	<code>\wr</code>

Greek Letters

TXFONTS

Emre Sermutlu

Introduction

TEXT

MATH

Common

Greek

Binary

Subsets

Inequalities

Triangles

Arrows

Operators

Functions

Miscel.

Alphabet

Brackets

Dots

Var. Size

EXTRA

Txfonts

Textcomp

Marvosym

Pifont

Chemarrow

α	<code>\alpha</code>	υ	<code>\upsilon</code>
β	<code>\beta</code>	ξ	<code>\xi</code>
γ	<code>\gamma</code>	τ	<code>\tau</code>
δ	<code>\delta</code>	ι	<code>\iota</code>
λ	<code>\lambda</code>	η	<code>\eta</code>
ω	<code>\omega</code>	ζ	<code>\zeta</code>
ψ	<code>\psi</code>	μ	<code>\mu</code>
χ	<code>\chi</code>	ν	<code>\nu</code>
ρ	<code>\rho</code>	ϱ	<code>\varrho</code>
ϵ	<code>\epsilon</code>	ε	<code>\varepsilon</code>
κ	<code>\kappa</code>	\varkappa	<code>\varkappa</code>
π	<code>\pi</code>	ϖ	<code>\varpi</code>
ϕ	<code>\phi</code>	φ	<code>\varphi</code>
σ	<code>\sigma</code>	ς	<code>\varsigma</code>
θ	<code>\theta</code>	ϑ	<code>\vartheta</code>

Greek and Hebrew Letters

TXFONTS

Emre Sermutlu

Introduction

TEXT

MATH

Common

Greek

Binary

Subsets

Inequalities

Triangles

Arrows

Operators

Functions

Miscel.

Alphabet

Brackets

Dots

Var. Size

EXTRA

Txfonts

Textcomp

Marvosym

Pifont

Chemarrow

Γ \Gamma

Δ \Delta

Λ \Lambda

Ω \Omega

Π \Pi

Φ \Phi

Ψ \Psi

Σ \Sigma

Θ \Theta

Υ \Upsilon

Ξ \Xi

F \digamma

Γ \varGamma

Δ \varDelta

Λ \varLambda

Ω \varOmega

Π \varPi

Φ \varPhi

Ψ \varPsi

Σ \varSigma

Θ \varTheta

Υ \varUpsilon

Ξ \varXi

\aleph \aleph

\beth \beth

\gimel \gimel

\daleth \daleth

Binary Operations I

TXFONTS

Emre Sermutlu

Introduction

TEXT

MATH

Common
Greek

Binary

Subsets

Inequalities

Triangles

Arrows

Operators

Functions

Miscel.

Alphabet

Brackets

Dots

Var. Size

EXTRA

Txfonts

Textcomp

Marvosym

Pifont

Chemarrow

\oplus	<code>\oplus</code>	\boxplus	<code>\boxplus</code>
\ominus	<code>\ominus</code>	\boxminus	<code>\boxminus</code>
\otimes	<code>\otimes</code>	\boxtimes	<code>\boxtimes</code>
\odot	<code>\odot</code>	\boxdot	<code>\boxdot</code>
\oslash	<code>\oslash</code>	\divideontimes	<code>\divideontimes</code>
\circ	<code>\circ</code>	\intercal	<code>\intercal</code>
\bigcirc	<code>\bigcirc</code>	\dotplus	<code>\dotplus</code>
\circledcirc	<code>\circledcirc</code>	\setminus	<code>\setminus</code>
\circleddash	<code>\circleddash</code>	\smallsetminus	<code>\smallsetminus</code>
\circledast	<code>\circledast</code>	\centerdot	<code>\centerdot</code>
\amalg	<code>\amalg</code>	\diamond	<code>\diamond</code>
\cup	<code>\cup</code>	\cap	<code>\cap</code>
\Cup	<code>\Cup</code>	\Cap	<code>\Cap</code>
\sqcup	<code>\sqcup</code>	\sqcap	<code>\sqcap</code>
\leftthreetimes	<code>\leftthreetimes</code>	\rightthreetimes	<code>\rightthreetimes</code>
\uplus	<code>\uplus</code>	\backepsilon	<code>\backepsilon</code>

Binary Operations II

TXFONTS

Emre Sermutlu

Introduction

TEXT

MATH

Common
Greek

Binary

Subsets

Inequalities

Triangles

Arrows

Operators

Functions

Miscel.

Alphabet

Brackets

Dots

Var. Size

EXTRA

Txfonts

Textcomp

Marvosym

Pifont

Chemarrow

\vee	<code>\vee</code>	\wedge	<code>\wedge</code>
\curlyvee	<code>\curlyvee</code>	\curlywedge	<code>\curlywedge</code>
\veebar	<code>\veebar</code>	\barwedge	<code>\barwedge</code>
\ltimes	<code>\ltimes</code>	\barwedge	<code>\doublebarwedge</code>
\rtimes	<code>\rtimes</code>	\dagger	<code>\dagger</code>
\dashv	<code>\dashv</code>	\ddagger	<code>\ddagger</code>
\vdash	<code>\vdash</code>	\nvDash	<code>\nvDash</code>
\vDash	<code>\vDash</code>	\nvDash	<code>\nvDash</code>
\Vdash	<code>\Vdash</code>	\nVdash	<code>\nVdash</code>
\models	<code>\models</code>	\nVDash	<code>\nVDash</code>
\Vvdash	<code>\Vvdash</code>	\pitchfork	<code>\pitchfork</code>
\bowtie	<code>\bowtie</code>	\smile	<code>\smile</code>
\Join	<code>\Join</code>	\smallsmile	<code>\smallsmile</code>
\because	<code>\because</code>	\frown	<code>\frown</code>
\therefore	<code>\therefore</code>	\smallfrown	<code>\smallfrown</code>
\And	<code>\And</code>	\bullet	<code>\bullet</code>

Binary Relations I

TXFONTS

Emre Sermutlu

Introduction

TEXT

MATH

Common

Greek

Binary

Subsets

Inequalities

Triangles

Arrows

Operators

Functions

Miscel.

Alphabet

Brackets

Dots

Var. Size

EXTRA

Txfonts

Textcomp

Marvosym

Pifont

Chemarrow

\cong	<code>\cong</code>	$\not\cong$	<code>\ncong</code>
\preccurlyeq	<code>\preccurlyeq</code>	\succcurlyeq	<code>\succcurlyeq</code>
\curlyeqprec	<code>\curlyeqprec</code>	\curlyeqsucc	<code>\curlyeqsucc</code>
\prec	<code>\prec</code>	\nprec	<code>\nprec</code>
\preceq	<code>\preceq</code>	\npreceq	<code>\npreceq</code>
\preccurlyapprox	<code>\preccurlyapprox</code>	\succcurlyapprox	<code>\succcurlyapprox</code>
\precsim	<code>\precsim</code>	\precnnsim	<code>\precnnsim</code>
\succ	<code>\succ</code>	\nsucc	<code>\nsucc</code>
\succeq	<code>\succeq</code>	\nsucceq	<code>\nsucceq</code>
\succcurlyapprox	<code>\succcurlyapprox</code>	\succcurlyapprox	<code>\succcurlyapprox</code>
\succnsim	<code>\succnsim</code>	\succnsim	<code>\succnsim</code>

Binary Relations II

TXFONTS

Emre Sermutlu

Introduction

TEXT

MATH

Common
Greek

Binary

Subsets

Inequalities

Triangles

Arrows

Operators

Functions

Miscel.

Alphabet

Brackets

Dots

Var. Size

EXTRA

Txfonts

Textcomp

Marvosym

Pifont

Chemarrow

	\mid		\nmid
	\shortmid		\nshortmid
	\parallel		\nparallel
	\shortparallel		\nshortparallel
~	\sim	~	\nsim
~	\thicksim	~	\doteq
\approx	\simeq	\approx	\doteqdot
\sim	\backsimeq	\sim	\between
\simeq	\backsim	\asymp	\asymptotic
\approx	\backapprox	\approx	\fallingdotseq
\approx	\thickapprox	\approx	\risingdotseq
\approx	\approxeq	\approx	\bumpeq
\equiv	\equiv	\equiv	\Bumpeq
\propto	\propto	\propto	\circeq
\propto	\varpropto	\propto	\eqcirc
\multimap	\multimap	\perp	\perp

Subset Relations

TXFONTS

Emre Sermutlu

Introduction

TEXT

MATH

Common

Greek

Binary

Subsets

Inequalities

Triangles

Arrows

Operators

Functions

Miscel.

Alphabet

Brackets

Dots

Var. Size

EXTRA

Txfonts

Textcomp

Marvosym

Pifont

Chemarrow

\subset	<code>\subset</code>	\supset	<code>\supset</code>
\subseteq	<code>\subseteq</code>	\supseteq	<code>\supseteq</code>
\sqsubseteq	<code>\sqsubseteq</code>	\sqsupseteq	<code>\sqsupseteq</code>
\sqsubset	<code>\sqsubset</code>	\sqsupset	<code>\sqsupset</code>
\sqsubseteq	<code>\sqsubseteq</code>	\sqsupseteq	<code>\sqsupseteq</code>
\Subset	<code>\Subset</code>	\Supset	<code>\Supset</code>
$\not\subset$	<code>\not\subset</code>	$\not\supset$	<code>\not\supset</code>
$\not\subseteq$	<code>\not\subseteq</code>	$\not\supseteq$	<code>\not\supseteq</code>
$\not\sqsubseteq$	<code>\not\sqsubseteq</code>	$\not\sqsupseteq$	<code>\not\sqsupseteq</code>
$\not\sqsubset$	<code>\not\sqsubset</code>	$\not\sqsupset$	<code>\not\sqsupset</code>
$\not\sqsubseteq$	<code>\not\sqsubseteq</code>	$\not\sqsupseteq$	<code>\not\sqsupseteq</code>
\varsubsetneq	<code>\varsubsetneq</code>	\varsupsetneq	<code>\varsupsetneq</code>
$\not\subseteq$	<code>\not\subseteq</code>	$\not\supseteq$	<code>\not\supseteq</code>
$\not\subsetneqq$	<code>\not\subsetneqq</code>	$\not\supsetneqq$	<code>\not\supsetneqq</code>
$\not\sqsubseteq$	<code>\not\sqsubseteq</code>	$\not\sqsupsetneqq$	<code>\not\sqsupsetneqq</code>
$\not\sqsubset$	<code>\not\sqsubset</code>	$\not\sqsupsetneqq$	<code>\not\sqsupsetneqq</code>
$\not\sqsubseteq$	<code>\not\sqsubseteq</code>	$\not\sqsupsetneqq$	<code>\not\sqsupsetneqq</code>

Inequalities I

TXFONTS

Emre Sermutlu

Introduction

TEXT

MATH

Common

Greek

Binary

Subsets

Inequalities

Triangles

Arrows

Operators

Functions

Miscel.

Alphabet

Brackets

Dots

Var. Size

EXTRA

Txfonts

Textcomp

Marvosym

Pifont

Chemarrow

<	<	$\not< \backslash nless$
>	>	$\not> \backslash ngtr$
\leqslant	$\backslash leqslant$	$\not\leqslant \backslash nleqslant$
\geqslant	$\backslash geqslant$	$\not\geqslant \backslash ngeqslant$
\leq	$\backslash leq$	$\not\leq \backslash nleq$
\geq	$\backslash geq$	$\not\geq \backslash ngeq$
\leqq	$\backslash leqq$	$\not\leqq \backslash nleqq$
\geqq	$\backslash geqq$	$\not\geqq \backslash ngeqq$
\ll	$\backslash eqslantless$	$\not\ll \backslash lneqq$
\gg	$\backslash eqslantgtr$	$\not\gg \backslash gneqq$
\lneq	$\backslash lneq$	$\not\lneq \backslash lvertneqq$
\gneq	$\backslash gneq$	$\not\gneq \backslash gvertneqq$

Inequalities II

TXFONTS

Emre Sermutlu

Introduction

TEXT

MATH

Common

Greek

Binary

Subsets

Inequalities

Triangles

Arrows

Operators

Functions

Miscel.

Alphabet

Brackets

Dots

Var. Size

EXTRA

Txfonts

Textcomp

Marvosym

Pifont

Chemarrow

$\ll \backslash 11$	$\lll \backslash 111$
$\gg \backslash gg$	$\ggg \backslash ggg$
$\lesssim \backslash lesssim$	$\lnsim \backslash lnsim$
$\gtrsim \backslash gtrsimeq$	$\gnsim \backslash gnsim$
$\lessapprox \backslash lessapprox$	$\lnapprox \backslash lnapprox$
$\gtrapprox \backslash gtrapprox$	$\gnapprox \backslash gnapprox$
$\lessgtr \backslash lessgtr$	$\lessdot \backslash lessdot$
$\gtrless \backslash gtrless$	$\gtreqdot \backslash gtreqdot$
$\lessseqgtr \backslash lesseqgtr$	$\lesseqqgtr \backslash lesseqqgtr$
$\gtreqless \backslash gtreqless$	$\gtreqqless \backslash gtreqqless$

Triangular Relations

Harpoons

TXFONTS

Emre Sermutlu

Introduction

TEXT

MATH

Common

Greek

Binary

Subsets

Inequalities

Triangles

Arrows

Operators

Functions

Miscel.

Alphabet

Brackets

Dots

Var. Size

EXTRA

Txfonts

Textcomp

Marvosym

Pifont

Chemarrow

△ \bigtriangleup
▷ \triangleright
▷ \ntriangleright
▷ \vartriangleright
▷ \rhd
▷ \unrhd
▷ \trianglerighteq
▷ \ntrianglerighteq
▶ \blacktriangleright
△ \triangleq

▽ \bigtriangledown
◀ \triangleleft
◀ \ntriangleleft
◀ \vartriangleleft
◀ \lhd
◀ \unlhd
◀ \trianglelefteq
◀ \ntrianglelefteq
◀ \blacktriangleleft

→ \rightharpoonup
→ \rightharpoondown
⇒ \rightleftharpoons
↑ \upharpoonright
↓ \downharpoonright

← \leftharpoonup
← \leftharpoondown
⇒ \leftrightharpoons
↑ \upharpoonleft
↓ \downharpoonleft

Arrows I

TXFONTS

Emre Sermutlu

Introduction

TEXT

MATH

Common

Greek

Binary

Subsets

Inequalities

Triangles

Arrows

Operators

Functions

Miscel.

Alphabet

Brackets

Dots

Var. Size

EXTRA

Txfonts

Textcomp

Marvosym

Pifont

Chemarrow

\rightarrow	<code>\rightarrow</code>	\leftarrow	<code>\leftarrow</code>
\Rightarrow	<code>\Rightarrow</code>	\Leftarrow	<code>\Leftarrow</code>
\longrightarrow	<code>\longrightarrow</code>	\Longleftarrow	<code>\Longleftarrow</code>
\Longrightarrow	<code>\Longrightarrow</code>	\Longleftarrow	<code>\Longleftarrow</code>
\uparrow	<code>\uparrow</code>	\downarrow	<code>\downarrow</code>
\Uparrow	<code>\Uparrow</code>	\Downarrow	<code>\Downarrow</code>
\rightarrowtail	<code>\rightarrowtail</code>	\leftrightharpoonup	<code>\leftrightharpoonup</code>
$\not\rightarrowtail$	<code>\not\rightarrowtail</code>	\leftrightharpoondown	<code>\leftrightharpoondown</code>
\updownarrow	<code>\updownarrow</code>	\updownarrow	<code>\updownarrow</code>
\Updownarrow	<code>\Updownarrow</code>	\nleqslant	<code>\nleqslant</code>
\nearrow	<code>\nearrow</code>	\leftrightsquigarrow	<code>\leftrightsquigarrow</code>
\nwarrow	<code>\nwarrow</code>	\Rightrightarrows	<code>\Rightrightarrows</code>
\swarrow	<code>\swarrow</code>	\longleftarrowtail	<code>\longleftarrowtail</code>
\searrow	<code>\searrow</code>	\Longleftarrowtail	<code>\Longleftarrowtail</code>
\iff	<code>\iff</code>	\leftrightsquigarrowtail	<code>\leftrightsquigarrowtail</code>

Arrows II

TXFONTS

Emre Sermutlu

Introduction

TEXT

MATH

Common

Greek

Binary

Subsets

Inequalities

Triangles

Arrows

Operators

Functions

Miscel.

Alphabet

Brackets

Dots

Var. Size

EXTRA

Txfonts

Textcomp

Marvosym

Pifont

Chemarrow

\Rrightarrow	<code>\rightrightarrows</code>	\Lleftarrow	<code>\leftleftarrows</code>
\Lleftarrow	<code>\rightleftarrows</code>	\Rrightarrow	<code>\leftrightarrows</code>
\Rightarrow	<code>\Rrightarrow</code>	\Lleftarrow	<code>\Lleftarrow</code>
\hookrightarrow	<code>\hookrightarrow</code>	\hookleftarrow	<code>\hookleftarrow</code>
\rightarrowtail	<code>\rightarrowtail</code>	\leftarrowtail	<code>\leftarrowtail</code>
\looparrowright	<code>\looparrowright</code>	\looparrowleft	<code>\looparrowleft</code>
\twoheadrightarrow	<code>\twoheadrightarrow</code>	\twoheadleftarrow	<code>\twoheadleftarrow</code>
\curvearrowright	<code>\curvearrowright</code>	\curvearrowleft	<code>\curvearrowleft</code>
\circlearrowright	<code>\circlearrowright</code>	\circlearrowleft	<code>\circlearrowleft</code>
\dashrightarrow	<code>\dashrightarrow</code>	\dashleftarrow	<code>\dashleftarrow</code>
\Rsh	<code>\Rsh</code>	\Lsh	<code>\Lsh</code>
\upuparrows	<code>\upuparrows</code>	\downdownarrows	<code>\downdownarrows</code>
\mapsto	<code>\mapsto</code>	\rightsquigarrow	<code>\rightsquigarrow</code>
\longmapsto	<code>\longmapsto</code>	\leadsto	<code>\leadsto</code>

Mathematical Operators

The following operators have two different sizes

TXFONTS

Emre Sermutlu

Introduction

TEXT

MATH

Common

Greek

Binary

Subsets

Inequalities

Triangles

Arrows

Operators

Functions

Miscel.

Alphabet

Brackets

Dots

Var. Size

EXTRA

Txfonts

Textcomp

Marvosym

Pifont

Chemarrow

\prod	Π	<code>\prod</code>	\coprod	\sqcup	\sqcup	<code>\coprod</code>
\sum	Σ	<code>\sum</code>	\bigcup	\cup	\cup	<code>\bigcup</code>
\int	$\textstyle\int$	<code>\int</code>	\bigcap	\cap	\cap	<code>\bigcap</code>
\oint	\oint	<code>\oint</code>	\bigoplus	\uplus	\uplus	<code>\biguplus</code>
\iint	$\textstyle\int\int$	<code>\iint</code>	\bigsqcup	\sqcup	\sqcup	<code>\bigsqcup</code>
\iiint	$\textstyle\int\int\int$	<code>\iiint</code>	\bigvee	\vee	\vee	<code>\bigvee</code>
\iiiiint	$\textstyle\int\int\int\int$	<code>\iiiiint</code>	\bigwedge	\wedge	\wedge	<code>\bigwedge</code>
$\dots\int$	$\dots\int$	<code>\dots\int</code>	\bigoplus	\oplus	\oplus	<code>\bigoplus</code>
$\dots\int$	$\dots\int$	<code>\dots\int</code>	\bigotimes	\otimes	\otimes	<code>\bigotimes</code>
\cdots	\cdots		\bullet	\odot	\odot	<code>\bigodot</code>

Mathematical Functions I

TXFONTS

Emre Sermutlu

Introduction

TEXT

MATH

Common

Greek

Binary

Subsets

Inequalities

Triangles

Arrows

Operators

Functions

Miscel.

Alphabet

Brackets

Dots

Var. Size

EXTRA

Txfonts

Textcomp

Marvosym

Pifont

Chemarrow

Pure Functions

Please note that $\sin x$ (`\sin x`) and $\sin x$ (`\sin x`) look totally different.

\sin	<code>\sin</code>	\arcsin	<code>\arcsin</code>	\sinh	<code>\sinh</code>
\cos	<code>\cos</code>	\arccos	<code>\arccos</code>	\cosh	<code>\cosh</code>
\tan	<code>\tan</code>	\arctan	<code>\arctan</code>	\tanh	<code>\tanh</code>
\cot	<code>\cot</code>	\arg	<code>\arg</code>	\coth	<code>\coth</code>
\sec	<code>\sec</code>	$m \bmod n$	<code>m\mod n</code>	\lg	<code>\lg</code>
\csc	<code>\csc</code>	$m \bmod n$	<code>m\bmod n</code>	\log	<code>\log</code>
\ln	<code>\ln</code>	$m \pmod n$	<code>m\pmod n</code>	\exp	<code>\exp</code>
\dim	<code>\dim</code>	$m \pod n$	<code>m\pod n</code>	\hom	<code>\hom</code>
\deg	<code>\deg</code>			\ker	<code>\ker</code>

Mathematical Functions II

TXFONTS

Emre Sermutlu

Introduction

TEXT

MATH

Common

Greek

Binary

Subsets

Inequalities

Triangles

Arrows

Operators

Functions

Miscel.

Alphabet

Brackets

Dots

Var. Size

EXTRA

Txfonts

Textcomp

Marvosym

Pifont

Chemarrow

Functions with Limits

The following functions may take limits below: $\lim_{x \rightarrow 0}$

This is written as: `\lim_{x \rightarrow 0}`

min	<code>\min</code>	lim inf	<code>\liminf</code>
max	<code>\max</code>	<u>lim</u>	<code>\varliminf</code>
inf	<code>\inf</code>	lim sup	<code>\limsup</code>
sup	<code>\sup</code>	<u>lim</u>	<code>\varlimsup</code>
det	<code>\det</code>	inj lim	<code>\injlim</code>
gcd	<code>\gcd</code>	\lim_{\rightarrow}	<code>\varinjlim</code>
Pr	<code>\Pr</code>	proj lim	<code>\proqlim</code>
lim	<code>\lim</code>	\lim_{\leftarrow}	<code>\varprojlim</code>

Miscellaneous Symbols I

TXFONTS

Emre Sermutlu

Introduction

TEXT

MATH

Common

Greek

Binary

Subsets

Inequalities

Triangles

Arrows

Operators

Functions

Miscel.

Alphabet

Brackets

Dots

Var. Size

EXTRA

Txfonts

Textcomp

Marvosym

Pifont

Chemarrow

\mathfrak{I}	<code>\Im</code>	ℓ	<code>\ell</code>
\mathfrak{R}	<code>\Re</code>	∂	<code>\partial</code>
\wp	<code>\wp</code>	\eth	<code>\eth</code>
\top	<code>\top</code>	\imath	<code>\imath</code>
\bot	<code>\bot</code>	\jmath	<code>\jmath</code>
\forall	<code>\forallall</code>	\Bbbk	<code>\Bbbk</code>
\exists	<code>\exists</code>	\exists	<code>\exists</code>
\nexists	<code>\nexists</code>	\Game	<code>\Game</code>
\neg	<code>\neg</code>	∞	<code>\infty</code>
\in	<code>\in</code>	\emptyset	<code>\emptyset</code>
\notin	<code>\notin</code>	\varnothing	<code>\varnothing</code>
\ni	<code>\ni</code>	\angle	<code>\angle</code>
\complement	<code>\complement</code>	\measuredangle	<code>\measuredangle</code>
\hbar	<code>\hbar</code>	\sphericalangle	<code>\sphericalangle</code>
\hslash	<code>\hslash</code>	\smallint	<code>\smallint</code>

Miscellaneous Symbols II

TXFONTS

Emre Sermutlu

Introduction

TEXT

MATH

Common
Greek

Binary

Subsets

Inequalities

Triangles

Arrows

Operators

Functions

Miscel.

Alphabet

Brackets

Dots

Var. Size

EXTRA

Txfonts

Textcomp

Marvosym

Pifont

Chemarrow

∇	<code>\nabla</code>	\backslash	<code>\backslash</code>
\mho	<code>\mho</code>	\diagdown	<code>\diagdown</code>
\square	<code>\square</code>	\diagup	<code>\diagup</code>
\Box	<code>\Box</code>	\blacksquare	<code>\blacksquare</code>
\triangle	<code>\triangle</code>	\Diamond	<code>\Diamond</code>
\vartriangle	<code>\vartriangle</code>	\blacktriangle	<code>\blacktriangle</code>
\triangledown	<code>\triangledown</code>	\blacktriangledown	<code>\blacktriangledown</code>
\lozenge	<code>\lozenge</code>	\blacklozenge	<code>\blacklozenge</code>
\surd	<code>\surd</code>	\heartsuit	<code>\heartsuit</code>
\checkmark	<code>\checkmark</code>	\diamondsuit	<code>\diamondsuit</code>
\sharp	<code>\sharp</code>	\spadesuit	<code>\spadesuit</code>
\natural	<code>\natural</code>	\clubsuit	<code>\clubsuit</code>
\flat	<code>\flat</code>	\star	<code>\star</code>
\prime	<code>\prime</code>	\bigstar	<code>\bigstar</code>
\backprime	<code>\backprime</code>	\circledR	<code>\circledR</code>
\mapstochar	<code>\mapstochar</code>	\circledS	<code>\circledS</code>

Mathematical Alphabets I

TXFONTS

Emre Sermutlu

Introduction

TEXT

MATH

Common

Greek

Binary

Subsets

Inequalities

Triangles

Arrows

Operators

Functions

Miscel.

Alphabet

Brackets

Dots

Var. Size

EXTRA

Txfonts

Textcomp

Marvosym

Pifont

Chemarrow

*ABCDEFGHIJKLMN
OPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz
1234567890*

`\mathnormal{...}`

*ABCDEFGHIJKLMN
OPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz
1234567890*

`\mathrm{...}`

*ABCDEFGHIJKLMN
OPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz
1234567890*

`\mathsf{...}`

Mathematical Alphabets II

TXFONTS

Emre Sermutlu

Introduction

TEXT

MATH

Common

Greek

Binary

Subsets

Inequalities

Triangles

Arrows

Operators

Functions

Miscel.

Alphabet

Brackets

Dots

Var. Size

EXTRA

Txfonts

Textcomp

Marvosym

Pifont

Chemarrow

**ABCDEFGHIJKLMN
OPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz
1234567890**

`\mathbf{...}`

*A B C D E F G H I J K L M N
O P Q R S T U V W X Y Z*

(Include `\usepackage{mathrsfs}`
before `\begin{document}`)

`\mathscr{...}`

*ABCDEFGHIJKLMN
OPQRSTUVWXYZ*

`\mathcal{...}`

Mathematical Alphabets III

TXFONTS

Emre Sermutlu

Introduction

TEXT

MATH

Common

Greek

Binary

Subsets

Inequalities

Triangles

Arrows

Operators

Functions

Miscel.

Alphabet

Brackets

Dots

Var. Size

EXTRA

Txfonts

Textcomp

Marvosym

Pifont

Chemarrow

<p>ΑΒΓΔΕΦΓΗΙΞΡΛΜΝ ΩΦΩΡΣΤΥΒΩΧΨΖ αβcdefghijklmnopqrstuvwxyz <i>gyvw</i></p>	<p>\mathfrak{...}</p>
<p>A B C D E F G H I J K L M N O P Q R S T U V W X Y Z <i>a b c d e f g h i j k l m n o p q r s t u v w x y z</i> 1 2 3 4 5 6 7 8 9 0 <i>α β π θ Φ Ψ Ω ...</i> $\in \hbar \partial \nabla \leftarrow \infty \emptyset \square ...$</p>	<p>\boldsymbol{...}</p>

Mathematical Alphabets IV

TXFONTS

Emre Sermutlu

Introduction

TEXT

MATH

Common

Greek

Binary

Subsets

Inequalities

Triangles

Arrows

Operators

Functions

Miscel.

Alphabet

Brackets

Dots

Var. Size

EXTRA

Txfonts

Textcomp

Marvosym

Pifont

Chemarrow

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z	<code>\mathbb{...}</code>
A B C D E F G H I J K L M N O P Q R S T U V W X Y Z	<code>\varmathbb{...}</code>

Brackets

These are variable sized

TXFONTS

Emre Sermutlu

Introduction

TEXT

MATH

Common
Greek

Binary
Subsets

Inequalities

Triangles

Arrows

Operators

Functions

Miscel.
Alphabet

Brackets

Dots

Var. Size

EXTRA

Txfonts

Textcomp

Marvosym

Pifont

Chemarrow

()	
[]	
	\vert	\Vert
{	\{	\}
<	\langle	\rangle
\lceil	\lceil	\rceil
\lfloor	\lfloor	\rfloor
\lgroup		\rgroup
\lvert		\rvert
\lVert		\rVert
\lmoustache		\rmoustache
\arrowvert		\Arrowvert
\backslash		\bracevert

Brackets - Math Accents

TXFONTS

Emre Sermutlu

Introduction

TEXT

MATH

Common

Greek

Binary

Subsets

Inequalities

Triangles

Arrows

Operators

Functions

Miscel.

Alphabet

Brackets

Dots

Var. Size

EXTRA

Txfonts

Textcomp

Marvosym

Pifont

Chemarrow

⊜ \ulcorner

⊲ \llcorner

⊸ \uparrow

⊸ \downarrow

⊸ \updownarrow

⊜ \urcorner

⊲ \lrcorner

⊸ \Uparrow

⊸ \Downarrow

⊸ \Updownarrow

ã \tilde{a}

â \hat{a}

ă \check{a}

ä \vec{a}

å \bar{a}

á \acute{a}

à \grave{a}

ă \breve{a}

à \dot{a}

ä \ddot{a}

ä \ddot{a}

ä \ddot{\ddot{a}}

å \mathring{a}

Dots

TXFONTS

Emre Sermutlu

Introduction

TEXT

MATH

Common

Greek

Binary

Subsets

Inequalities

Triangles

Arrows

Operators

Functions

Miscel.

Alphabet

Brackets

Dots

Var. Size

EXTRA

Txfonts

Textcomp

Marvosym

Pifont

Chemarrow

...	<code>\ldots</code>	lower dots
...	<code>\cdots</code>	center dots
⋮	<code>\ddots</code>	diagonal dots
⋮	<code>\vdots</code>	vertical dots
.....	<code>\dotfill</code>	fill with dots
...	<code>\dots</code>	lower or center
...	<code>\dotsm</code>	multiplication
...	<code>\dotsi</code>	dots for integrals
...	<code>\dotsb</code>	dots for binary op.
...	<code>\dotsc</code>	dots after commas
...	<code>\dotso</code>	other dots
.	<code>\ldotp</code>	
.	<code>\cdotp</code>	
:	<code>\colon</code>	

Variable Size Constructions

TXFONTS

Emre Sermutlu

Introduction

TEXT

MATH

Common

Greek

Binary

Subsets

Inequalities

Triangles

Arrows

Operators

Functions

Miscel.

Alphabet

Brackets

Dots

Var. Size

EXTRA

Txfonts

Textcomp

Marvosym

Pifont

Chemarrow

$$\overbrace{abc}$$

$$\underbrace{abc}$$

$$\xleftarrow{abc}$$

$$\xrightarrow{abc}$$

`\overbrace{abc}`

`\underbrace{abc}`

`\xleftarrow{abc}`

`\xrightarrow{abc}`

$$\sqrt{abc}$$

$$\widetilde{abc}$$

$$\widehat{abc}$$

$$\overline{abc}$$

$$\underline{abc}$$

`\sqrt{abc}`

`\widetilde{abc}`

`\widehat{abc}`

`\overline{abc}`

`\underline{abc}`

$$\overrightarrow{abc}$$

$$\overleftarrow{abc}$$

$$\overleftrightarrow{abc}$$

$$\underrightarrow{abc}$$

$$\underleftarrow{abc}$$

$$\underleftrightarrow{abc}$$

`\overrightarrow{abc}`

`\overleftarrow{abc}`

`\overleftrightarrow{abc}`

`\underrightarrow{abc}`

`\underleftarrow{abc}`

`\underleftrightarrow{abc}`

Txfonts I

Include `\usepackage{txfonts}` before `\begin{document}`

TXFONTS

Emre Sermutlu

Introduction

TEXT

MATH

Common

Greek

Binary

Subsets

Inequalities

Triangles

Arrows

Operators

Functions

Miscel.

Alphabet

Brackets

Dots

Var. Size

EXTRA

Txfonts

Textcomp

Marvosym

Pifont

Chemarrow

\sqcap	<code>\bigsqcapplus</code>	\oint	<code>\ointclockwise</code>
\sqcup	<code>\bigsqcupplus</code>	\oint	<code>\ointctrcclockwise</code>
\iint	<code>\iint</code>	\oint	<code>\ointclockwise</code>
\iiint	<code>\iiint</code>	\oint	<code>\ointctrcclockwise</code>
\iiiint	<code>\iiiint</code>	\oint	<code>\oiintclockwise</code>
\sqint	<code>\sqint</code>	\oint	<code>\oiintctrcclockwise</code>
\sqiint	<code>\sqiint</code>	\oint	<code>\varointclockwise</code>
\sqiiint	<code>\sqiiint</code>	\oint	<code>\varointctrcclockwise</code>
$\dots\int$	<code>\idotsint</code>	\oint	<code>\varoiintclockwise</code>
f	<code>\fint</code>	\oint	<code>\varoiintctrcclockwise</code>
\oint	<code>\oint</code>	\oint	<code>\varoiintclockwise</code>
\oiint	<code>\oiint</code>	\oint	<code>\varoiintctrcclockwise</code>

Txfonts II

TXFONTS

Emre Sermutlu

Introduction

TEXT

MATH

Common
Greek

Binary
Subsets

Inequalities

Triangles

Arrows

Operators
Functions

Miscel.
Alphabet

Brackets

Dots

Var. Size

EXTRA

Txfonts

Textcomp

Marvosym

Pifont

Chemarrow

✗ \varprod	→ \multimap
⊖ \circledless	→• \multimapdot
⊖ \circledgtr	○— \multimapinv
✗ \lJoin	●— \multimapdotinv
✗ \rJoin	○○ \multimapboth
✗ \opentimes	●● \multimapdotboth
✗ \openJoin	○● \multimapdotbothA
✗ \lrtimes	●○ \multimapdotbothB
⊿ \Perp	○○ \multimapbothvert
⊼ \preceqq	●● \multimapdotbothvert
⊽ \precneqq	○● \multimapdotbothAvert
⊾ \succeqq	●○ \multimapdotbothBvert
⊷ \succneqq	F \VvDash

Txfonts III

TXFONTS

Emre Sermutlu

Introduction

TEXT

MATH

Common
Greek

Binary
Subsets

Inequalities

Triangles

Arrows

Operators

Functions

Miscel.

Alphabet

Brackets

Dots

Var. Size

EXTRA

Txfonts

Textcomp

Marvosym

Pifont

Chemarrow

\coloneq	<code>\coloneq</code>	g	<code>\varg</code>
$\text{\texttt{Coloneq}}$	<code>\Coloneq</code>	v	<code>\varv</code>
\coloneqq	<code>\coloneqq</code>	w	<code>\varw</code>
$\text{\texttt{Coloneqq}}$	<code>\Coloneqq</code>	y	<code>\vary</code>
\eqcolon	<code>\eqcolon</code>	\mathcal{C}	<code>\mathcent</code>
$\text{\texttt{Eqcolon}}$	<code>\Eqcolon</code>	\mathcal{L}	<code>\mathsterling</code>
\eqqcolon	<code>\eqqcolon</code>	\mathcal{E}	<code>\notin</code>
$\text{\texttt{Eqqcolon}}$	<code>\Eqqcolon</code>	\mathcal{D}	<code>\notni</code>
\colonsim	<code>\colonsim</code>	\rightarrowtail	<code>\strictif</code>
$\text{\texttt{Colonsim}}$	<code>\Colonsim</code>	\leftarrowtail	<code>\strictfi</code>
\colonapprox	<code>\colonapprox</code>	\approxtail	<code>\strictiff</code>
$\text{\texttt{Colonapprox}}$	<code>\Colonapprox</code>	$//$	<code>\varparallel</code>
\eqsim	<code>\eqsim</code>	$\backslash\backslash$	<code>\varparallelinv</code>

Txfonts IV

TXFONTS

Emre Sermutlu

Introduction

TEXT

MATH

Common

Greek

Binary

Subsets

Inequalities

Triangles

Arrows

Operators

Functions

Miscel.

Alphabet

Brackets

Dots

Var. Size

EXTRA

Txfonts

Textcomp

Marvosym

Pifont

Chemarrow

$\not\equiv \backslash nequiv$	$\# \backslash nvarparallel$
$\not\approx \backslash napproxeq$	$\nparallel \backslash nvarparallelinv$
$\not\approx \backslash nthickapprox$	$\not\approx \backslash nbumpeq$
$\not\approx \backslash nsimeq$	$\not\approx \backslash nBumpeq$
$\not\approx \backslash nbacksimeq$	$\nparallel \backslash nVdash$
$\not\approx \backslash nasymp$	$\nleftrightarrow \backslash ntwoheadleftarrow$
$\not\leftarrow \backslash nbacksim$	$\nrightarrow \backslash ntwoheadrightarrow$
$\not\approx \backslash npreccurlyeq$	$\not\approx \backslash nsucccurlyeq$
$\not\preceq \backslash npreceqq$	$\not\preceq \backslash nsucceqq$
$\not\approx \backslash nprecsim$	$\not\approx \backslash nsuccsim$
$\not\approx \backslash nprecapprox$	$\not\approx \backslash nsuccapprox$
$\not\ll \backslash nll$	$\not\gg \backslash ngg$
$\not\lessdot \backslash nlesssim$	$\not\gtrdot \backslash ngtrsim$
$\not\lessdot \backslash nlessapprox$	$\not\gtrdot \backslash ngtrapprox$
$\not\lessdot \backslash nlessgtr$	$\not\lessdot \backslash ngtrless$

Txfonts V

TXFONTS

Emre Sermutlu

Introduction

TEXT

MATH

Common

Greek

Binary

Subsets

Inequalities

Triangles

Arrows

Operators

Functions

Miscel.

Alphabet

Brackets

Dots

Var. Size

EXTRA

Txfonts

Textcomp

Marvosym

Pifont

Chemarrow

∅ \circledbar	⊄ \nsqsubset
∅ \circledwedge	⊅ \nsqsupset
∅ \circledvee	⊉ \nsqsubseteq
∅ \circledbslash	⊊ \nsqsupseteq
○ \medcirc	⊈ \nSubset
● \medbullet	⊉ \nSupset
⊗ \invamp	⊉ \nsubseteqqq
⊕ \sqcapplus	◆ \Diamonddot
⊕ \sqcupplus	◆ \Diamondblack
⤠ \mappedfromchar	⤤ \lambdabar
⤡ \mmappedfromchar	⤤ \lambda daslash
⤢ \Mappedfromchar	♥ \varheartsuit
⤣ \Mmappedfromchar	♣ \varclubsuit
⤤ \mmapstochar	♦ \varspadesuit
⤥ \Mmapstochar	◆ \vardiamondsuit

Txfonts VI

TXFONTS

Emre Sermutlu

Introduction

TEXT

MATH

Common

Greek

Binary

Subsets

Inequalities

Triangles

Arrows

Operators

Functions

Miscel.

Alphabet

Brackets

Dots

Var. Size

EXTRA

Txfonts

Textcomp

Marvosym

Pifont

Chemarrow

○→ \circcleright	←○ \circleleft
○→ \circledddotright	←○ \circledddotleft
□→ \boxright	←□ \boxleft
□→ \boxRight	↔□ \boxLeft
□→ \boxdotright	←□ \boxdotleft
□→ \boxdotRight	↔□ \boxdotLeft
◇→ \Diamondright	↔◇ \Diamondleft
◇→ \DiamondRight	↔◇ \DiamondLeft
◊→ \Diamonddotright	↔◊ \Diamonddotleft
◊→ \DiamonddotRight	↔◊ \DiamonddotLeft
↗ \Nearrow	↖ \Nwarrow
↖ \Searrow	↘ \Swarrow
⇒ \Rrightarrow	↔ \leftsquigarrow
↔ \dashleftrightarrow	

Txfonts VII

TXFONTS

Emre Sermutlu

Introduction

TEXT

MATH

Common

Greek

Binary

Subsets

Inequalities

Triangles

Arrows

Operators

Functions

Miscel.

Alphabet

Brackets

Dots

Var. Size

EXTRA

Txfonts

Textcomp

Marvosym

Pifont

Chemarrow

α	<code>\alphaup</code>	υ	<code>\upsilonup</code>
β	<code>\betaau</code>	ξ	<code>\xiup</code>
γ	<code>\gammamaup</code>	τ	<code>\tauau</code>
δ	<code>\deltaetaup</code>	ι	<code>\iotaup</code>
λ	<code>\lambdaambdaup</code>	η	<code>\etaup</code>
ω	<code>\omegau</code>	ζ	<code>\zetaup</code>
ψ	<code>\psiup</code>	μ	<code>\muup</code>
χ	<code>\chiup</code>	ν	<code>\nuup</code>
ρ	<code>\rhoup</code>	ϱ	<code>\varrhoup</code>
ϵ	<code>\epsilonpsilonup</code>	ε	<code>\varepsilonup</code>
π	<code>\piup</code>	ϖ	<code>\varpiup</code>
ϕ	<code>\phiip</code>	φ	<code>\varphiip</code>
σ	<code>\sigmaigmaup</code>	ς	<code>\varsigmaup</code>
θ	<code>\thetaetaup</code>	ϑ	<code>\varthetaetaup</code>
κ	<code>\kappaappaup</code>		

Textcomp I

Include `\usepackage{textcomp}` before `\begin{document}`

TXFONTS

Emre Sermutlu

Introduction

TEXT

MATH

Common

Greek

Binary

Subsets

Inequalities

Triangles

Arrows

Operators

Functions

Miscel.

Alphabet

Brackets

Dots

Var. Size

EXTRA

Txfonts

Textcomp

Marvosym

Pifont

Chemarrow

\$	<code>\textdollar</code>	\$	<code>\textdollaroldstyle</code>
¢	<code>\textcent</code>	¢	<code>\textcentoldstyle</code>
€	<code>\texteuro</code>	₵	<code>\textcolonmonetary</code>
¥	<code>\textyen</code>	↓	<code>\textdownarrow</code>
£	<code>\textsterling</code>	→	<code>\textrightarrow</code>
₺	<code>\textlira</code>	←	<code>\textleftarrow</code>
฿	<code>\textbaht</code>	↑	<code>\textuparrow</code>
₲	<code>\textguarani</code>	˝	<code>\textacutedbl</code>
₫	<code>\textdong</code>	ˇ	<code>\textasciicaron</code>
₦	<code>\textnaira</code>	ˉ	<code>\textasciimacron</code>
₱	<code>\textpeso</code>	ˊ	<code>\textasciiacute</code>
₩	<code>\textwon</code>	˝	<code>\textasciidieresis</code>
¤	<code>\textcurrency</code>	˝	<code>\textgravedbl</code>
f	<code>\textflorin</code>	ˇ	<code>\textascibreve</code>
Â	<code>\newtie{A}</code>	ˋ	<code>\textasciigrave</code>
â	<code>\newtie{a}</code>	R	<code>\textrecipe</code>

Textcomp II

TXFONTS

Emre Sermutlu

Introduction

TEXT

MATH

Common

Greek

Binary

Subsets

Inequalities

Triangles

Arrows

Operators

Functions

Miscel.

Alphabet

Brackets

Dots

Var. Size

EXTRA

Txfonts

Textcomp

Marvosym

Pifont

Chemarrow

(P)	\textcircledP	0	\textzerooldstyle
(C)	\textcopyright	1	\textoneoldstyle
SM	\textservicemark	2	\texttwooldstyle
(D)	\textcopyleft	3	\textthreeoldstyle
(R)	\textregistered	4	\textfouroldstyle
TM	\texttrademark	5	\textfiveoldstyle
°	\textdegree	6	\textsixoldstyle
½	\textonehalf	7	\textsevenoldstyle
¼	\textonequarter	8	\texteightoldstyle
¾	\textthreequarters	9	\textnineoldstyle
–	\textminus	¹	\textonesuperior
±	\textpm	²	\texttwosuperior
÷	\textdiv	³	\textthreesuperior
×	\texttimes	¬	\textlnot
√	\textsurd		

Textcomp III

TXFONTS

Emre Sermutlu

Introduction

TEXT

MATH

Common
Greek

Binary
Subsets

Inequalities

Triangles

Arrows

Operators

Functions

Miscel.

Alphabet

Brackets

Dots

Var. Size

EXTRA

Txfonts

Textcomp

Marvosym

Pifont

Chemarrow

	\textbrokenbar	♪	\textmusicalnote
	\textbardbl	<	\textlangle
¶	\textparagraph	>	\textrangle
¶	\textpilcrow	[],[\textlbrackdbl
○	\textbigcircle	[],]	\textrbrackdbl
ḥ	\textblank	{,	\textlquill
†	\textdagger	},	\textrquill
‡	\textdaggerdbl	°C	\textcelsius
%	\textdiscount	μ	\textmu
~	\texttildelow	Ω	\textohm
№	\textnumero	Ɔ	\textmho
€	\textestimated	★	\textborn
§	\textsection	օօ	\textdivorced
'	\textquotesingle	⊗⊗	\textmarried
•	\textbullet	†	\textdied
◦	\textopenbullet	leaf	\textleaf

Textcomp IV

TXFONTS

Emre Sermutlu

Introduction

TEXT

MATH

Common

Greek

Binary

Subsets

Inequalities

Triangles

Arrows

Operators

Functions

Miscel.

Alphabet

Brackets

Dots

Var. Size

EXTRA

Txfonts

Textcomp

Marvosym

Pifont

Chemarrow

```
※ \textreferencemark
%oo \textpertenthousand
%o \textperthousand
* \textasteriskcentered
. \textperiodcentered
a \textordfeminine
o \textordmasculine
/ \textfractionsolidus
= \textdblhyphen
= \textdblhyphenchar
, \textquotestraightbase
" \textquotestraightdblbase
? \textinterrobang
! \textinterrobangdown
— \textthreequartersemdash
— \texttwelveudash
```

Marvosym I

Include \usepackage{marvosym} before \begin{document}

TXFONTS

Emre Sermutlu

Introduction

TEXT

MATH

Common

Greek

Binary

Subsets

Inequalities

Triangles

Arrows

Operators

Functions

Miscel.

Alphabet

Brackets

Dots

Var. Size

EXTRA

Txfonts

Textcomp

Marvosym

Pifont

Chemarrow

€	\EUR	ℳ	\Denarius
€	\EURdig	ℳ	\Shilling
€	\EURtm	ℳ	\Anglesign
€	\EURcr	·	\Squaredot
€	\EURhv	≡	\Corresponds
ℳ	\Pfund	→	\Vectorarrow
@	\Ecommerce	→	\Vectorarrowhigh
\$	\EyesDollar	→	\MVRrightarrow

†	\Ankh	⌚	\Womanface
†	\Cross	⌚	\MartinVogel
❖	\Celtcross	﴿	\Bouquet
♥	\Heart	🌐	\Mundus
🦇	\Bat	☯	\Yinyang
FH	\FHB0logo	😊	\Smiley
FH	\FHB0LOGO	🙁	\Frowny
FH BD	\FullFHB0	Ⓐ	\CircledA

Marvosym II

TXFONTS

Emre Sermutlu

Introduction

TEXT

MATH

Common

Greek

Binary

Subsets

Inequalities

Triangles

Arrows

Operators

Functions

Miscel.

Alphabet

Brackets

Dots

Var. Size

EXTRA

Txfonts

Textcomp

Marvosym

Pifont

Chemarrow

0 \MVZero

1 \MVOne

2 \MVTwo

3 \MVThree

4 \MVFour

5 \MVFive

6 \MVSix

7 \MVSeven

8 \MVEight

9 \MVNine

♀ \Female

● \FEMALE

♀♀ \FemaleFemale

♂♂ \FemaleMale

♂♀ \Hermaphrodite

♂ \Male

□ \MALE

♂♂ \MaleMale

○ \Neutral

♂♀ \HERMAPHRODITE

► \Forward

◀ \Rewind

▶ \ForwardToEnd

▼ \MoveDown

▲ \MoveUp

▲ \ToTop

▼ \ToBottom

◀ \RewindToStart

▶ \ForwardToIndex

◀◀ \RewindToIndex

Marvosym III

TXFONTS

Emre Sermutlu

Introduction

TEXT

MATH

Common
Greek

Binary
Subsets

Inequalities

Triangles

Arrows

Operators

Functions

Miscel.

Alphabet

Brackets

Dots

Var. Size

EXTRA

Txfonts

Textcomp

Marvosym

Pifont

Chemarrow

☿ \Mercury

♀ \Venus

♂ \Earth

♂ \Mars

♃ \Jupiter

♄ \Saturn

♅ \Uranus

♆ \Neptune

♀ \Pluto

☽ \Moon

☉ \Sun

♈ \Aries

♉ \Taurus

♊ \Gemini

♋ \Cancer

♌ \Leo

♍ \Virgo

♎ \Libra

♏ \Scorpio

♐ \Sagittarius

♑ \Capricorn

♒ \Aquarius

♓ \Pisces

✂ \Cutleft

✂ \Cutright

✂ \Leftscissors

✂ \Rightscissors

Marvosym IV

TXFONTS

Emre Sermutlu

Introduction

TEXT

MATH

Common

Greek

Binary

Subsets

Inequalities

Triangles

Arrows

Operators

Functions

Miscel.

Alphabet

Brackets

Dots

Var. Size

EXTRA

Txfonts

Textcomp

Marvosym

Pifont

Chemarrow

☣ \Biohazard	ⓧ \BSEfree
CE \CEsign	▲ \Estatically
Ex \Explosionsafe	STOP \Stopsign
☢ \Radioactivity	★ \Laserbeam
L \Lsteel	● \Circsteel
T \Tsteel	■ \Squaresteel
I \TTsteel	■ \Rectsteel
L \RoundedTsteel	◆ \Hexasteel
T \RoundedLsteel	● \Octosteel
I \RoundedTTsteel	— \Flatsteel
↓ \Force	○ \Circpipe
== \Beam	□ \Squarepipe
△ \Bearing	□ \Rectpipe
△ \Fixedbearing	↶ \Lefttorque
△ \Loosebearing	↷ \Righttorque
↔ \Lineload	

Marvosym V

TXFONTS

Emre Sermutlu

Introduction

TEXT

MATH

Common
Greek

Binary
Subsets

Inequalities

Triangles

Arrows

Operators

Functions

Miscel.

Alphabet

Brackets

Dots

Var. Size

EXTRA

Txfonts

Textcomp

Marvosym

Pifont

Chemarrow

 \Email	 \Bicycle
 \fax	 \Football
 \Faxmachine	 \Pointinghand
 \Lightning	 \Checkedbox
 \Pickup	 \Gentsroom
 \Emailct	 \Ladiesroom
 \FAX	 \Wheelchair
 \Letter	 \Clocklogo
 \Mobilefone	 \Industry
 \Telefon	 \Writinghand
 \Info	 \Coffeecup
 \MVAt	 \Crossedbox

 \ComputerMouse	 \SerialInterface
 \ParallelPort	 \Keyboard
 \SerialPort	 \Printer

Marvosym VI

TXFONTS

Emre Sermutlu

Introduction

TEXT

MATH

Common

Greek

Binary

Subsets

Inequalities

Triangles

Arrows

Operators

Functions

Miscel.

Alphabet

Brackets

Dots

Var. Size

EXTRA

Txfonts

Textcomp

Marvosym

Pifont

Chemarrow

Ⓐ \CleaningA		\AtForty
Ⓕ \CleaningF		\AtSixty
Ⓕ \CleaningFF		\AtNinetyFive
Ⓟ \CleaningP		\ShortThirty
Ⓟ \CleaningPP		\ShortForty
ⓧ \Tumbler		\ShortFifty
ⓧ \NoTumbler		\ShortSixty
ⓧ \NoChemicalCleaning		\ShortNinetyFive
△ \Bleech		\SpecialForty
△ \NoBleech		\WashCotton
Ⓣ \IroningI		\WashSynthetics
Ⓣ \IroningII		\WashWool
Ⓣ \IroningIII		\Handwash
Ⓣ \NoIroning		\Dontwash

Pifont I

Include `\usepackage{pifont}` before `\begin{document}`

TXFONTS

Emre Sermutlu

Introduction

TEXT

MATH

Common
Greek

Binary
Subsets

Inequalities

Triangles

Arrows

Operators

Functions

Miscel.

Alphabet

Brackets

Dots

Var. Size

EXTRA

Txfonts

Textcomp

Marvosym

Pifont

Chemarrow

☎	<code>\ding{37}</code>	✖	<code>\ding{53}</code>	❖	<code>\ding{69}</code>
⌚	<code>\ding{38}</code>	✖️	<code>\ding{54}</code>	◆	<code>\ding{70}</code>
⌚⌚	<code>\ding{39}</code>	✗	<code>\ding{55}</code>	❖	<code>\ding{71}</code>
✈	<code>\ding{40}</code>	✗	<code>\ding{56}</code>	★	<code>\ding{72}</code>
✉	<code>\ding{41}</code>	✚	<code>\ding{57}</code>	☆	<code>\ding{73}</code>
☛	<code>\ding{42}</code>	✚	<code>\ding{58}</code>	●	<code>\ding{74}</code>
☞	<code>\ding{43}</code>	✚	<code>\ding{59}</code>	☆	<code>\ding{75}</code>
✌	<code>\ding{44}</code>	❖	<code>\ding{60}</code>	☆	<code>\ding{76}</code>
✉️	<code>\ding{45}</code>	†	<code>\ding{61}</code>	☆	<code>\ding{77}</code>
✎	<code>\ding{46}</code>	†	<code>\ding{62}</code>	☆	<code>\ding{78}</code>
✎	<code>\ding{47}</code>	†	<code>\ding{63}</code>	☆	<code>\ding{79}</code>
✎	<code>\ding{48}</code>	✖	<code>\ding{64}</code>	☆	<code>\ding{80}</code>
♾	<code>\ding{49}</code>	✡	<code>\ding{65}</code>	*	<code>\ding{81}</code>
❖	<code>\ding{50}</code>	✚	<code>\ding{66}</code>	*	<code>\ding{82}</code>
✓	<code>\ding{51}</code>	❖	<code>\ding{67}</code>	*	<code>\ding{83}</code>
✓	<code>\ding{52}</code>	❖	<code>\ding{68}</code>	*	<code>\ding{84}</code>

Pifont II

TXFONTS

Emre Sermutlu

Introduction

TEXT

MATH

Common
Greek

Binary
Subsets

Inequalities

Triangles

Arrows

Operators

Functions

Miscel.

Alphabet

Brackets

Dots

Var. Size

EXTRA

Txfonts

Textcomp

Marvosym

Pifont

Chemarrow

✳ \ding{85}	✳ \ding{101}	◆ \ding{117}
✳ \ding{86}	✳ \ding{102}	❖ \ding{118}
✳ \ding{87}	✳ \ding{103}	▷ \ding{119}
✳ \ding{88}	✳ \ding{104}	\ding{120}
✳ \ding{89}	✳ \ding{105}	\ding{121}
✳ \ding{90}	✳ \ding{106}	■ \ding{122}
✳ \ding{91}	✳ \ding{107}	‘ \ding{123}
✳ \ding{92}	● \ding{108}	’ \ding{124}
✳ \ding{93}	○ \ding{109}	“ \ding{125}
✳ \ding{94}	■ \ding{110}	” \ding{126}
✿ \ding{95}	□ \ding{111}	⌚ \ding{161}
✿ \ding{96}	□ \ding{112}	⌚ \ding{162}
✿ \ding{97}	□ \ding{113}	⌚ \ding{163}
✿ \ding{98}	□ \ding{114}	⌚ \ding{164}
✳ \ding{99}	▲ \ding{115}	⌚ \ding{165}
✳ \ding{100}	▼ \ding{116}	⌚ \ding{166}

Pifont III

TXFONTS

Emre Sermutlu

Introduction

TEXT

MATH

Common
Greek

Binary
Subsets

Inequalities

Triangles

Arrows

Operators

Functions

Miscel.

Alphabet

Brackets

Dots

Var. Size

EXTRA

Txfonts

Textcomp

Marvosym

Pifont

Chemarrow

❶	\ding{167}	❶	\ding{182}	❷	\ding{198}
❷	\ding{168}	❷	\ding{183}	❸	\ding{199}
❸	\ding{169}	❸	\ding{184}	❹	\ding{200}
❹	\ding{170}	❹	\ding{185}	❺	\ding{201}
❺	\ding{171}	❺	\ding{186}	❻	\ding{202}
❻	\ding{172}	❻	\ding{187}	❻	\ding{203}
❻	\ding{173}	❻	\ding{188}	❻	\ding{204}
❻	\ding{174}	❻	\ding{189}	❻	\ding{205}
❻	\ding{175}	❻	\ding{190}	❻	\ding{206}
❻	\ding{176}	❻	\ding{191}	❻	\ding{207}
❻	\ding{177}	❻	\ding{192}	❻	\ding{208}
❻	\ding{178}	❻	\ding{193}	❻	\ding{209}
❻	\ding{179}	❻	\ding{194}	❻	\ding{210}
❻	\ding{180}	❻	\ding{195}	❻	\ding{211}
❻	\ding{181}	❻	\ding{196}		
		❻	\ding{197}		

Pifont IV

TXFONTS

Emre Sermutlu

Introduction

TEXT

MATH

Common
Greek

Binary
Subsets

Inequalities

Triangles

Arrows

Operators

Functions

Miscel.

Alphabet

Brackets

Dots

Var. Size

EXTRA

Txfonts

Textcomp

Marvosym

Pifont

Chemarrow

→ \ding{212}	► \ding{228}	⇒ \ding{245}
→ \ding{213}	► \ding{229}	↗ \ding{246}
↔ \ding{214}	► \ding{230}	↘ \ding{247}
↑ \ding{215}	► \ding{231}	⤠ \ding{248}
↖ \ding{216}	► \ding{232}	⤡ \ding{249}
→ \ding{217}	⇒ \ding{233}	⤢ \ding{250}
↗ \ding{218}	⇒ \ding{234}	⤣ \ding{251}
→ \ding{219}	⤤ \ding{235}	⤥ \ding{252}
⤠ \ding{220}	⤦ \ding{236}	⤧ \ding{253}
→ \ding{221}	⤨ \ding{237}	⤩ \ding{254}
→ \ding{222}	⤪ \ding{238}	⤫ \ding{33}
⤬ \ding{223}	⤪ \ding{239}	⤭ \ding{34}
⤮ \ding{224}	⤪ \ding{241}	⤮ \ding{35}
⤠ \ding{225}	⤪ \ding{242}	⤯ \ding{36}
⤠ \ding{226}	⤠ \ding{243}	
⤠ \ding{227}	⤠ \ding{244}	

Chemarrow

Include `\usepackage{chemarrow}` before `\begin{document}`

TXFONTS

Emre Sermutlu

Introduction

TEXT

MATH

Common

Greek

Binary

Subsets

Inequalities

Triangles

Arrows

Operators

Functions

Miscel.

Alphabet

Brackets

Dots

Var. Size

EXTRA

Txfonts

Textcomp

Marvosym

Pifont

Chemarrow

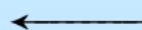
abc



`\autorightarrow{abc}{def}`

def

abc



`\autoleftarrow{abc}{def}`

def

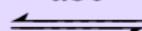
abc



`\autorightleftharpoons{abc}{def}`

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abc



`\autoleftrightharpoons{abc}{def}`

def

→

`\chemarrow`