```
\dfn{Title}{Content}
```

Definition 0.0.1: Title

Content

```
\dfnc{}{}
```

Definition 0.1

```
\qs{}{}
```

Question 1

```
\nt{}
```

Note:-

```
\clm{}{}
```

Claim 0.0.1

```
\ex{}{}
```

Example 0.0.1

```
\thm{}{}
```

Theorem 0.0.1

```
\pf{}
```

Proof: □

```
\cor{}{}
```

Corollary 0.0.1

```
\mlemma{}{}
```

Lemma 0.0.1

```
\mprop{}{}
```

Proposition 0.0.1

Algorithm

```
\begin{algorithm}[H]
\caption{Example}
\KwIn{This is some input}
\KwOut{This is some output}
\SetAlgoLined
\SetNoFillComment
\tcc{This is a comment}
\vspace{3mm}
some code here\;
$x \leftarrow 0$\;
$y \leftarrow 0$\;
\uIf{$ x > 5$} {
    x is greater than 5 \tcp*{This is also a comment}
}
\Else {
    x is less than or equal to 5\;
}
\ForEach{y in 0..5} {
    $y \leftarrow y + 1$\;
}
\For{$y$ in $0..5$} {
    $y \leftarrow y - 1$\;
}
\While{$x > 5$} {
    $x \leftarrow x - 1$\;
}
\Return Return something here\;
\end{algorithm}
```

Algorithm 1: Example

Input: This is some input
Output: This is some output
`/* This is a comment */`

```
1  some code here;
2  x ← 0;
3  y ← 0;
4  if x > 5 then
5  |  x is greater than 5 ;                    // This is also a comment
6  else
7  |  x is less than or equal to 5;
8  end
9  foreach y in 0..5 do
10 |  y ← y + 1;
11 end
12 for y in 0..5 do
13 |  y ← y − 1;
14 end
15 while x > 5 do
16 |  x ← x − 1;
17 end
18 return Return something here;
```

LaTeX Mathematical Symbols

The more unusual symbols are not defined in base LaTeX (NFSS) and require `\usepackage{amssymb}`

1 Greek and Hebrew letters

α	\alpha	κ	\kappa	ψ	\psi	$\digamma$	\digamma	Δ	\Delta	Θ	\Theta
β	\beta	λ	\lambda	ρ	\rho	ε	\varepsilon	Γ	\Gamma	Υ	\Upsilon
χ	\chi	μ	\mu	σ	\sigma	$\varkappa$	\varkappa	Λ	\Lambda	Ξ	\Xi
δ	\delta	ν	\nu	τ	\tau	φ	\varphi	Ω	\Omega		
ϵ	\epsilon	o	o	θ	\theta	ϖ	\varpi	Φ	\Phi	$\aleph$	\aleph
η	\eta	ω	\omega	υ	\upsilon	ϱ	\varrho	Π	\Pi	$\beth$	\beth
γ	\gamma	ϕ	\phi	ξ	\xi	ς	\varsigma	Ψ	\Psi	$\daleth$	\daleth
ι	\iota	π	\pi	ζ	\zeta	ϑ	\vartheta	Σ	\Sigma	$\gimel$	\gimel

2 LaTeX math constructs

$\frac{abc}{xyz}$	\frac{abc}{xyz}	$\overline{abc}$	\overline{abc}	$\overrightarrow{abc}$	\overrightarrow{abc}
f'	f'	$\underline{abc}$	\underline{abc}	$\overleftarrow{abc}$	\overleftarrow{abc}
$\sqrt{abc}$	\sqrt{abc}	$\widehat{abc}$	\widehat{abc}	$\overbrace{abc}$	\overbrace{abc}
$\sqrt[n]{abc}$	\sqrt[n]{abc}	$\widetilde{abc}$	\widetilde{abc}	$\underbrace{abc}$	\underbrace{abc}

3 Delimiters

|	|	{	\{	$\lfloor$	\lfloor	/	/	$\Uparrow$	\Uparrow	$\llcorner$	\llcorner
|	\vert	}	\}	$\rfloor$	\rfloor	\	\backslash	$\uparrow$	\uparrow	$\lrcorner$	\lrcorner
$\|\|$	\\|	$\langle$	\langle	$\lceil$	\lceil	[	[	$\Downarrow$	\Downarrow	$\ulcorner$	\ulcorner
$\|\|$	\Vert	$\rangle$	\rangle	$\rceil$	\rceil	]	]	$\downarrow$	\downarrow	$\urcorner$	\urcorner

Use the pair `\left`s_1 and `\right`s_2 to match height of delimiters s_1 and s_2 to the height of their contents, e.g., `\left|` *expr* `\right|` `\left\{` *expr* `\right\}` `\left\Vert` *expr* `\right.`

4 Variable-sized symbols (displayed formulae show larger version)

$\sum$	\sum	$\int$	\int	$\biguplus$	\biguplus	$\bigoplus$	\bigoplus	$\bigvee$	\bigvee
$\prod$	\prod	$\oint$	\oint	$\bigcap$	\bigcap	$\bigotimes$	\bigotimes	$\bigwedge$	\bigwedge
$\coprod$	\coprod	$\iint$	\iint	$\bigcup$	\bigcup	$\bigodot$	\bigodot	$\bigsqcup$	\bigsqcup

5 Standard Function Names

Function names should appear in Roman, not Italic, e.g.,

Correct: `\tan(at-n\pi)` $\longrightarrow \tan(at - n\pi)$
Incorrect: `tan(at-n\pi)` $\longrightarrow tan(at - n\pi)$

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

6 Binary Operation/Relation Symbols

$*$	\ast	$\pm$	\pm	$\cap$	\cap	$\lhd$	\lhd
$\star$	\star	$\mp$	\mp	$\cup$	\cup	$\rhd$	\rhd
$\cdot$	\cdot	$\amalg$	\amalg	$\uplus$	\uplus	$\triangleleft$	\triangleleft
$\circ$	\circ	$\odot$	\odot	$\sqcap$	\sqcap	$\triangleright$	\triangleright
$\bullet$	\bullet	$\ominus$	\ominus	$\sqcup$	\sqcup	$\unlhd$	\unlhd
$\bigcirc$	\bigcirc	$\oplus$	\oplus	$\wedge$	\wedge	$\unrhd$	\unrhd
$\diamond$	\diamond	$\oslash$	\oslash	$\vee$	\vee	$\bigtriangledown$	\bigtriangledown
$\times$	\times	$\otimes$	\otimes	$\dagger$	\dagger	$\bigtriangleup$	\bigtriangleup
$\div$	\div	$\wr$	\wr	$\ddagger$	\ddagger	$\setminus$	\setminus
$\cdot$	\centerdot	$\Box$	\Box	$\barwedge$	\barwedge	$\veebar$	\veebar
$\circledast$	\circledast	$\boxplus$	\boxplus	$\curlywedge$	\curlywedge	$\curlyvee$	\curlyvee
$\circledcirc$	\circledcirc	$\boxminus$	\boxminus	$\Cap$	\Cap	$\Cup$	\Cup
$\circleddash$	\circleddash	$\boxtimes$	\boxtimes	$\bot$	\bot	$\top$	\top
$\dotplus$	\dotplus	$\boxdot$	\boxdot	$\intercal$	\intercal	$\rightthreetimes$	\rightthreetimes
$\divideontimes$	\divideontimes	$\square$	\square	$\doublebarwedge$	\doublebarwedge	$\leftthreetimes$	\leftthreetimes

$\equiv$	\equiv	$\leq$	\leq	$\geq$	\geq	$\perp$	\perp
$\cong$	\cong	$\prec$	\prec	$\succ$	\succ	$\mid$	\mid
$\neq$	\neq	$\preceq$	\preceq	$\succeq$	\succeq	$\parallel$	\parallel
$\sim$	\sim	$\ll$	\ll	$\gg$	\gg	$\bowtie$	\bowtie
$\simeq$	\simeq	$\subset$	\subset	$\supset$	\supset	$\Join$	\Join
$\approx$	\approx	$\subseteq$	\subseteq	$\supseteq$	\supseteq	$\ltimes$	\ltimes
$\asymp$	\asymp	$\sqsubset$	\sqsubset	$\sqsupset$	\sqsupset	$\rtimes$	\rtimes
$\doteq$	\doteq	$\sqsubseteq$	\sqsubseteq	$\sqsupseteq$	\sqsupseteq	$\smile$	\smile
$\propto$	\propto	$\dashv$	\dashv	$\vdash$	\vdash	$\frown$	\frown
$\models$	\models	$\in$	\in	$\ni$	\ni	$\notin$	\notin

$\approxeq$	\approxeq	$\leqq$	\leqq	$\geqq$	\geqq	$\lessgtr$	\lessgtr
$\thicksim$	\thicksim	$\leqslant$	\leqslant	$\geqslant$	\geqslant	$\lesseqgtr$	\lesseqgtr
$\backsim$	\backsim	$\lessapprox$	\lessapprox	$\gtrapprox$	\gtrapprox	$\lesseqqgtr$	\lesseqqgtr
$\backsimeq$	\backsimeq	$\lll$	\lll	$\ggg$	\ggg	$\gtreqqless$	\gtreqqless
$\triangleq$	\triangleq	$\lessdot$	\lessdot	$\gtrdot$	\gtrdot	$\gtreqless$	\gtreqless
$\circeq$	\circeq	$\lesssim$	\lesssim	$\gtrsim$	\gtrsim	$\gtrless$	\gtrless
$\bumpeq$	\bumpeq	$\eqslantless$	\eqslantless	$\eqslantgtr$	\eqslantgtr	$\backepsilon$	\backepsilon
$\Bumpeq$	\Bumpeq	$\precsim$	\precsim	$\succsim$	\succsim	$\between$	\between
$\doteqdot$	\doteqdot	$\precapprox$	\precapprox	$\succapprox$	\succapprox	$\pitchfork$	\pitchfork
$\thickapprox$	\thickapprox	$\Subset$	\Subset	$\Supset$	\Supset	$\shortmid$	\shortmid
$\fallingdotseq$	\fallingdotseq	$\subseteqq$	\subseteqq	$\supseteqq$	\supseteqq	$\smallfrown$	\smallfrown
$\risingdotseq$	\risingdotseq	$\sqsubset$	\sqsubset	$\sqsupset$	\sqsupset	$\smallsmile$	\smallsmile
$\varpropto$	\varpropto	$\preccurlyeq$	\preccurlyeq	$\succcurlyeq$	\succcurlyeq	$\Vdash$	\Vdash
$\therefore$	\therefore	$\curlyeqprec$	\curlyeqprec	$\curlyeqsucc$	\curlyeqsucc	$\vDash$	\vDash
$\because$	\because	$\blacktriangleleft$	\blacktriangleleft	$\blacktriangleright$	\blacktriangleright	$\Vvdash$	\Vvdash
$\eqcirc$	\eqcirc	$\trianglelefteq$	\trianglelefteq	$\trianglerighteq$	\trianglerighteq	$\shortparallel$	\shortparallel
$\neq$	\neq	$\vartriangleleft$	\vartriangleleft	$\vartriangleright$	\vartriangleright	$\nshortparallel$	\nshortparallel

$\ncong$	\ncong	$\nleq$	\nleq	$\ngeq$	\ngeq	$\nsubseteq$	\nsubseteq
$\nmid$	\nmid	$\nleqq$	\nleqq	$\ngeqq$	\ngeqq	$\nsupseteq$	\nsupseteq
$\nparallel$	\nparallel	$\nleqslant$	\nleqslant	$\ngeqslant$	\ngeqslant	$\nsubseteqq$	\nsubseteqq
$\nshortmid$	\nshortmid	$\nless$	\nless	$\ngtr$	\ngtr	$\nsupseteqq$	\nsupseteqq
$\nshortparallel$	\nshortparallel	$\nprec$	\nprec	$\nsucc$	\nsucc	$\subsetneq$	\subsetneq
$\nsim$	\nsim	$\npreceq$	\npreceq	$\nsucceq$	\nsucceq	$\supsetneq$	\supsetneq
$\nVDash$	\nVDash	$\precnapprox$	\precnapprox	$\succnapprox$	\succnapprox	$\subsetneqq$	\subsetneqq
$\nvDash$	\nvDash	$\precnsim$	\precnsim	$\succnsim$	\succnsim	$\supsetneqq$	\supsetneqq
$\nvdash$	\nvdash	$\lnapprox$	\lnapprox	$\gnapprox$	\gnapprox	$\varsubsetneq$	\varsubsetneq
$\ntriangleleft$	\ntriangleleft	$\lneq$	\lneq	$\gneq$	\gneq	$\varsupsetneq$	\varsupsetneq
$\ntrianglelefteq$	\ntrianglelefteq	$\lneqq$	\lneqq	$\gneqq$	\gneqq	$\varsubsetneqq$	\varsubsetneqq
$\ntriangleright$	\ntriangleright	$\lnsim$	\lnsim	$\gnsim$	\gnsim	$\varsupsetneqq$	\varsupsetneqq
$\ntrianglerighteq$	\ntrianglerighteq	$\lvertneqq$	\lvertneqq	$\gvertneqq$	\gvertneqq		

7 Arrow symbols

$\leftarrow$	\leftarrow	$\longleftarrow$	\longleftarrow	$\uparrow$	\uparrow
$\Leftarrow$	\Leftarrow	$\Longleftarrow$	\Longleftarrow	$\Uparrow$	\Uparrow
$\rightarrow$	\rightarrow	$\longrightarrow$	\longrightarrow	$\downarrow$	\downarrow
$\Rightarrow$	\Rightarrow	$\Longrightarrow$	\Longrightarrow	$\Downarrow$	\Downarrow
$\leftrightarrow$	\leftrightarrow	$\longleftrightarrow$	\longleftrightarrow	$\updownarrow$	\updownarrow
$\Leftrightarrow$	\Leftrightarrow	$\Longleftrightarrow$	\Longleftrightarrow	$\Updownarrow$	\Updownarrow
$\mapsto$	\mapsto	$\longmapsto$	\longmapsto	$\nearrow$	\nearrow
$\hookleftarrow$	\hookleftarrow	$\hookrightarrow$	\hookrightarrow	$\searrow$	\searrow
$\leftharpoonup$	\leftharpoonup	$\rightharpoonup$	\rightharpoonup	$\swarrow$	\swarrow
$\leftharpoondown$	\leftharpoondown	$\rightharpoondown$	\rightharpoondown	$\nwarrow$	\nwarrow
$\rightleftharpoons$	\rightleftharpoons	$\leadsto$	\leadsto		
$\dashrightarrow$	\dashrightarrow	$\dashleftarrow$	\dashleftarrow	$\leftleftarrows$	\leftleftarrows
$\leftrightarrows$	\leftrightarrows	$\Lleftarrow$	\Lleftarrow	$\twoheadleftarrow$	\twoheadleftarrow
$\leftarrowtail$	\leftarrowtail	$\looparrowleft$	\looparrowleft	$\leftrightharpoons$	\leftrightharpoons
$\curvearrowleft$	\curvearrowleft	$\circlearrowleft$	\circlearrowleft	$\Lsh$	\Lsh
$\upuparrows$	\upuparrows	$\upharpoonleft$	\upharpoonleft	$\downharpoonleft$	\downharpoonleft
$\multimap$	\multimap	$\leftrightsquigarrow$	\leftrightsquigarrow	$\rightrightarrows$	\rightrightarrows
$\rightleftarrows$	\rightleftarrows	$\rightrightarrows$	\rightrightarrows	$\rightleftarrows$	\rightleftarrows
$\twoheadrightarrow$	\twoheadrightarrow	$\rightarrowtail$	\rightarrowtail	$\looparrowright$	\looparrowright
$\rightleftharpoons$	\rightleftharpoons	$\curvearrowright$	\curvearrowright	$\circlearrowright$	\circlearrowright
$\Rsh$	\Rsh	$\downdownarrows$	\downdownarrows	$\upharpoonright$	\upharpoonright
$\downharpoonright$	\downharpoonright	$\rightsquigarrow$	\rightsquigarrow		
$\nleftarrow$	\nleftarrow	$\nrightarrow$	\nrightarrow	$\nLeftarrow$	\nLeftarrow
$\nRightarrow$	\nRightarrow	$\nleftrightarrow$	\nleftrightarrow	$\nLeftrightarrow$	\nLeftrightarrow

8 Miscellaneous symbols

∞	\infty	$\forall$	\forall	$\Bbbk$	\Bbbk	$\wp$	\wp
∇	\nabla	$\exists$	\exists	$\bigstar$	\bigstar	$\angle$	\angle
∂	\partial	$\nexists$	\nexists	$\diagdown$	\diagdown	$\measuredangle$	\measuredangle
$\eth$	\eth	$\emptyset$	\emptyset	$\diagup$	\diagup	$\sphericalangle$	\sphericalangle
$\clubsuit$	\clubsuit	$\varnothing$	\varnothing	$\Diamond$	\Diamond	$\complement$	\complement
$\diamondsuit$	\diamondsuit	$\imath$	\imath	$\Finv$	\Finv	$\triangledown$	\triangledown
$\heartsuit$	\heartsuit	$\jmath$	\jmath	$\Game$	\Game	$\triangle$	\triangle
$\spadesuit$	\spadesuit	ℓ	\ell	$\hbar$	\hbar	$\vartriangle$	\vartriangle
$\cdots$	\cdots	$\iiiint$	\iiiint	$\hslash$	\hslash	$\blacklozenge$	\blacklozenge
$\vdots$	\vdots	$\iiint$	\iiint	$\lozenge$	\lozenge	$\blacksquare$	\blacksquare
$\ldots$	\ldots	$\iint$	\iint	$\mho$	\mho	$\blacktriangle$	\blacktriangle
$\ddots$	\ddots	$\sharp$	\sharp	$\prime$	\prime	$\blacktriangledown$	\blacktrinagledown
$\Im$	\Im	$\flat$	\flat	$\square$	\square	$\backprime$	\backprime
$\Re$	\Re	$\natural$	\natural	$\surd$	\surd	$\circledS$	\circledS

9 Math mode accents

$\acute{a}$	\acute{a}	$\bar{a}$	\bar{a}	$\acute{A}$	\Acute{\Acute{A}}	$\bar{\bar{A}}$	\Bar{\Bar{A}}
$\breve{a}$	\breve{a}	$\check{a}$	\check{a}	$\breve{A}$	\Breve{\Breve{A}}	$\check{A}$	\Check{\Check{A}}
$\ddot{a}$	\ddot{a}	$\dot{a}$	\dot{a}	$\ddot{A}$	\Ddot{\Ddot{A}}	$\dot{A}$	\Dot{\Dot{A}}
$\grave{a}$	\grave{a}	$\hat{a}$	\hat{a}	$\grave{A}$	\Grave{\Grave{A}}	$\hat{A}$	\Hat{\Hat{A}}
$\tilde{a}$	\tilde{a}	$\vec{a}$	\vec{a}	$\tilde{A}$	\Tilde{\Tilde{A}}	$\vec{A}$	\Vec{\Vec{A}}

10 Array environment, examples

Simplest version: `\begin{array}{`*cols*`}` row_1 `\\` row_2 `\\` $\ldots$ row_m `\end{array}`
where *cols* includes one character [`lrc`] for each column (with optional characters `|` inserted for vertical lines) and row_j includes character `&` a total of $(n-1)$ times to separate the n elements in the row. Examples:

```
\left( \begin{array}{cc} 2\tau & 7\phi-frac5{12} \\
          3\psi & \frac{\pi}8 \end{array} \right)
\left( \begin{array}{c} x \\ y \end{array} \right)
\mbox{~and~} \left[ \begin{array}{cc|r}
     3 & 4 & 5 \\ 1 & 3 & 729 \end{array} \right]
```

$$\left(\begin{array}{cc} 2\tau & 7\phi-\frac{5}{12} \\ 3\psi & \frac{\pi}{8} \end{array} \right) \left(\begin{array}{c} x \\ y \end{array} \right) \text{ and } \left[\begin{array}{cc|r} 3 & 4 & 5 \\ 1 & 3 & 729 \end{array} \right]$$

```
f(z) =     \left\{ \begin{array}{rcl}
       \overline{\overline{z^2}+\cos z} & \mbox{for}
       & |z|<3 \\ 0  & \mbox{for} & 3\leq|z|\leq5 \\
       \sin\overline{z} & \mbox{for} & |z|>5
             \end{array}\right.
```

$$f(z) = \left\{ \begin{array}{rcl} \overline{\overline{z^2}+\cos z} & \text{for} & |z|<3 \\ 0 & \text{for} & 3\leq|z|\leq5 \\ \sin\overline{z} & \text{for} & |z|>5 \end{array}\right.$$

11 Other Styles (math mode only)

Caligraphic letters: `$\mathcal{A}$` etc.: $\mathcal{ABCDEFGHIJKLMNOPQRSTUVWXYZ}$

Mathbb letters: `$\mathbb{A}$` etc.: $\mathbb{ABCDEFGHIJKLMNOPQRSTUVWXYZ}$

Mathfrak letters: `$\mathfrak{A}$` etc.: $\mathfrak{ABCDEFGHIJKLMNOPQRSTUVWXYZabc123}$

Math Sans serif letters: `$\mathsf{A}$` etc.: $\mathsf{ABCDEFGHIJKLMNOPQRSTUVWXYZabc123}$

Math bold letters: `$\mathbf{A}$` etc.: $\mathbf{ABCDEFGHIJKLMNOPQRSTUVWXYZabc123}$

Math bold italic letters: define `\def\mathbi#1{\textbf{\em #1}}` then use `$\mathbi{A}$` etc.:
$\boldsymbol{ABCDEFGHIJKLMNOPQRSTUVWXYZ\ abc\ \ 123}$

12 Font sizes

Math Mode:

$$\int f^{-1}(x-x_a)\,dx \qquad \texttt{\${\displaystyle \int f\^{}\{-1\}(x-x\_a)\textbackslash,dx\}\$}$$

$$\textstyle \int f^{-1}(x-x_a)\,dx \qquad \texttt{\${\textstyle \int f\^{}\{-1\}(x-x\_a)\textbackslash,dx\}\$}$$

$$\scriptstyle \int f^{-1}(x-x_a)\,dx \qquad \texttt{\${\scriptstyle \int f\^{}\{-1\}(x-x\_a)\textbackslash,dx\}\$}$$

$$\scriptscriptstyle \int f^{-1}(x-x_a)\,dx \qquad \texttt{\${\scriptscriptstyle \int f\^{}\{-1\}(x-x\_a)\textbackslash,dx\}\$}$$

Text Mode:

`\tiny` = tiny
`\scriptsize` = scriptsize
`\footnotesize` = footnotesize
`\small` = small
`\normalsize` = normal
`\large` = large
`\Large` = Large
`\LARGE` = LARGE
`\huge` = huge
`\Huge` = Huge

13 Text Mode: Accents and Symbols

ó	`\'{o}`	ö	`\"{o}`	ô	`\^{o}`	ò	`\`{o}`	õ	`\~{o}`	ō	`\={o}`	ș	`\d s`
ȯ	`\.{o}`	ŏ	`\u{o}`	ő	`\H{o}`	o͡o	`\t{oo}`	ǫ	`\c{o}`	ọ	`\d{o}`	s̊	`\r s`
o̲	`\b{o}`	Å	`\AA`	å	`\aa`	ß	`\ss`	ı	`\i`	ȷ	`\j`	s̋	`\H s`
ø	`\o`	s͡	`\t s`	š	`\v s`	Ø	`\O`	¶	`\P`	§	`\S`		
æ	`\ae`	Æ	`\AE`	†	`\dag`	‡	`\ddag`	©	`\copyright`	£	`\pounds`		