Essential Mathematical LaTeX

Version 0.02

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1 Introduction

This document is a supplement to "Essential-LaTeX", describing mathematical typesetting LaTeX. It makes no attempt at completeness so if in doubt **read the manual**.

2 Math, Display-math and Equation

Mathematics is treated by TeX completely differently from ordinary text. There are two special *modes* for mathematics, *math mode* and *display math mode*.

Math mode commands are surrounded by `\(` and `\)`.

Some mathematics set inline $2\times 3 = 6$. Note that spaces in the input file are ignored in math mode.

```
... set inline \( 2\times 3 =   6 \).
Note that spaces ...
```

Display math mode commands are surrounded by `\[` and `\]`.

A larger equation to be displayed on a line by itself.

$$f(x) = \sum_{i=0}^{\infty}\frac{f^{(i)}(x)}{i!}$$

```
... to be displayed on a line by itself.
\[ f(x) =
 \sum_{i=0}^{\infty}\frac{f^{(i)}(x)}{i!} \]
```

There is a variant of Display math mode, the equation environment which automatically generates an equation number.

$$\left(\begin{array}{cc} 1 & 2 \\ 0 & 1 \end{array}\right)\left(\begin{array}{cc} 2 & 0 \\ 1 & 3 \end{array}\right) = \left(\begin{array}{cc} 4 & 6 \\ 1 & 3 \end{array}\right) \qquad (1)$$

```
\begin{equation}
\left(\begin{array}{cc}
1 & 2 \\0 & 1
\end{array}\right)
\left(\begin{array}{cc}
2 & 0\\1 & 3
\end{array}\right)
=
\left(\begin{array}{cc}
4 & 6 \\1 & 3
\end{array}\right)
\end{equation}
```

The short examples above show the main types of commands available in math mode.

1. Subscripts and superscripts are produced with `_` and `^`, as in `x_{1} = p^{2}` $x_1 = p^2$.
2. Fractions are produced by the `\frac` command. `\(\frac{a + b}{c}\)` $\frac{a+b}{c}$.
3. Various commands give names to mathematical symbols.
   `\infty \Rightarrow \surd \bigotimes` $\infty \Rightarrow \surd \bigotimes$
4. Arrays are produced by the array environment. This is identical to the tabular environment described in *essential*-LaTeX except that the entries are typeset in math mode instead of LR mode. Note that the array environment does not put brackets arround the array so it can also be used for setting determinants, or even sets of equations in which you want the columns to line up.
5. The commands `\left` and `\right` produce delimiters which grow as large as needed, they can be used with a variety of symbols eg. `\left( \left\{ \left|`. The full set of these delimiters is shown in Table 9 below.

3 Spacing

All spaces in the input file are ignored in math mode. Sometimes you may want to adjust the spacing. Use one of the following commands or an explicit `\hspace`.

`\,` thin space	`\:` medium space
`\!` negative thin space	`\;` thick space

A good example of where LaTeX needs some help with spacing is

$\int\!\!\int z\, dx\,dy$ instead of $\int\int z dx dy$ `\int\!\!\int z\, dx dy .. \int\int z dx dy.`

4 Changing fonts in math mode

The default math mode font is *math italic*. This should not be confused with ordinary *text italic*. The font for 'ordinary' letters can be changed with the usual commands, `\em`, `\bf` etc. Note that lower case Greek letters are just regarded as mathematical symbols, `\alpha` etc, and are not affected by these commands.

`\bf` produces **bold face roman** letters. If you wish to have ***bold face math italic*** letters, and bold face Greek letters and mathematical symbols, use the `\boldmath` command *before* going into math mode. This changes the default math fonts to bold.

$x = 2\pi \Rightarrow x \simeq 6.28$
$x = 2\pi \Rightarrow x \simeq 6.28$
$\boldsymbol{x = 2\pi \Rightarrow x \simeq 6.28}$

```
\( x = 2\pi \Rightarrow x \simeq 6.28 \)
\(\bf x = 2\pi \Rightarrow x \simeq 6.28 \)
{\boldmath
\(x = {\bf2}\pi \Rightarrow x \simeq{\bf6.28}\)}
```

There is also a calligraphic font for upper case letters produced by the `\cal` command.

$\mathcal{F}$ `\( \cal F \)`

5 Symbols

The tables show most of the symbols available from the standard LaTeX symbol fonts. Negations of the relational symbols can be made with the `\not` command.

$G \not\equiv H$ `G \not\equiv H`

6 What about $'s?

If you have converted to LaTeX from plain or AMS-TeX, you will probably be wondering why there has been no mention of $ and $$.

In these systems math mode is surrounded by `$`'s and display math mode is surrounded by `$$`. This has certain drawbacks over the LaTeX system as it is difficult for your text editor to match `$`'s as it is hard to tell which ones are starting math mode and which are ending it. TeX will also get confused if you miss a $ out.

The (incorrect) input

```
let (a,b,c)$ be a Pythagorean triple, i.e.\ three
integers such that $a^{2}+b^{2}=c^{2}$.
```

produces the slightly mysterious error message

```
! Missing $ inserted.
<inserted text>
                $
<to be read again>
                   ^
l.56 ...triple, i.e.\ three integers such that $a^
                                                  {2}+b^{2}=c^{2}$
?
```

Note that it reports the wrong error and in the wrong place, the use of the `^` command out of math mode. TeX has typeset 'be a ... such that' in math mode and *exited* math mode at the `$` after 'such that'. If you had made the equivalent LaTeX error, LaTeX has a better idea of what you indended:

```
let (a,b,c)\) be a Pythagorean triple, i.e.\ three
integers such that \(a^{2}+b^{2}=c^{2}\)
```

The error message may still be unintelligable, but at least it reports the error in the right place, you have used `\)` to end math mode when you were not in math mode (as you omitted the `\(` which should have been before the `(a,b,c)`).

```
LaTeX error.  See LaTeX manual for explanation.
              Type  H <return>  for immediate help.
! Bad math environment delimiter.
\@latexerr ...for immediate help.}\errmessage {#1}

\)...ifinner $\else \@badmath \fi \else \@badmath
                                                  \fi
l.56 let (a,b,c)\)
                   be a Pythagorean triple, i.e.\ three integers such that \...

?
```

The single dollar is sometimes useful for small sections of math.

Let G be a p-group	`Let $G$ be a $p$-group`

The double dollar is *not* always equivalent to `\[ ... \]`, and so should not be used if you want your LaTeX file to be compatible with different styles and style options (try the fleqn style option).

7 $\mathcal{A}\mathcal{M}\mathcal{S}$-TeX symbols

The standard LaTeX fonts have enough symbols for most people, Tables 1–12. If you need more you could try the $\mathcal{A}\mathcal{M}\mathcal{S}$-TeX extra symbol fonts, most easily obtained by including `amssymbols` in the `\documentstyle` option list. See Table 13.

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

Table 1: Greek Letters

$\pm$	`\pm`	$\cap$	`\cap`	$\diamond$	`\diamond`	$\oplus$	`\oplus`
$\mp$	`\mp`	$\cup$	`\cup`	$\bigtriangleup$	`\bigtriangleup`	$\ominus$	`\ominus`
$\times$	`\times`	$\uplus$	`\uplus`	$\bigtriangledown$	`\bigtriangledown`	$\otimes$	`\otimes`
$\div$	`\div`	$\sqcap$	`\sqcap`	$\triangleleft$	`\triangleleft`	$\oslash$	`\oslash`
$\ast$	`\ast`	$\sqcup$	`\sqcup`	$\triangleright$	`\triangleright`	$\odot$	`\odot`
$\star$	`\star`	$\vee$	`\vee`	$\lhd$	`\lhd`	$\bigcirc$	`\bigcirc`
$\circ$	`\circ`	$\wedge$	`\wedge`	$\rhd$	`\rhd`	$\dagger$	`\dagger`
$\bullet$	`\bullet`	$\setminus$	`\setminus`	$\unlhd$	`\unlhd`	$\ddagger$	`\ddagger`
$\cdot$	`\cdot`	$\wr$	`\wr`	$\unrhd$	`\unrhd`	$\amalg$	`\amalg`
$+$	`+`	$-$	`-`				

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`	$\mid$	`\mid`
$\ll$	`\ll`	$\gg$	`\gg`	$\asymp$	`\asymp`	$\parallel$	`\parallel`
$\subset$	`\subset`	$\supset$	`\supset`	$\approx$	`\approx`	$\bowtie$	`\bowtie`
$\subseteq$	`\subseteq`	$\supseteq$	`\supseteq`	$\cong$	`\cong`	$\Join$	`\Join`
$\sqsubset$	`\sqsubset`	$\sqsupset$	`\sqsupset`	$\neq$	`\neq`	$\smile$	`\smile`
$\sqsubseteq$	`\sqsubseteq`	$\sqsupseteq$	`\sqsupseteq`	$\doteq$	`\doteq`	$\frown$	`\frown`
$\in$	`\in`	$\ni$	`\ni`	$\propto$	`\propto`	$=$	`=`
$\vdash$	`\vdash`	$\dashv$	`\dashv`	$<$	`<`	$>$	`>`
$:$	`:`						

Table 3: Relation Symbols

$,$	`,`	$;$	`;`	$\colon$	`\colon`	$\ldotp$	`\ldotp`	$\cdotp$	`\cdotp`

Table 4: Punctuation 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`

Table 5: Arrow Symbols

$\ldots$	`\ldots`	$\cdots$	`\cdots`	$\vdots$	`\vdots`	$\ddots$	`\ddots`
$\aleph$	`\aleph`	$\prime$	`\prime`	$\forall$	`\forall`	∞	`\infty`
$\hbar$	`\hbar`	$\emptyset$	`\emptyset`	$\exists$	`\exists`	$\Box$	`\Box`
$\imath$	`\imath`	∇	`\nabla`	$\neg$	`\neg`	$\Diamond$	`\Diamond`
$\jmath$	`\jmath`	$\surd$	`\surd`	$\flat$	`\flat`	$\triangle$	`\triangle`
ℓ	`\ell`	$\top$	`\top`	$\natural$	`\natural`	$\clubsuit$	`\clubsuit`
$\wp$	`\wp`	$\bot$	`\bot`	$\sharp$	`\sharp`	$\diamondsuit$	`\diamondsuit`
$\Re$	`\Re`	$\\|$	`|`	$\backslash$	`\backslash`	$\heartsuit$	`\heartsuit`
$\Im$	`\Im`	$\angle$	`\angle`	∂	`\partial`	$\spadesuit$	`\spadesuit`
$\mho$	`\mho`	$.$	`.`	$\vert$	`|`		

Table 6: Miscellaneous Symbols

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

Table 7: Variable-sized Symbols

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

Table 8: Log-like Symbols

$($	`(`	$)$	`)`	$\uparrow$	`\uparrow`	$\Uparrow$	`\Uparrow`
$[$	`[`	$]$	`]`	$\downarrow$	`\downarrow`	$\Downarrow$	`\Downarrow`
$\{$	`\{`	$\}$	`\}`	$\updownarrow$	`\updownarrow`	$\Updownarrow$	`\Updownarrow`
$\lfloor$	`\lfloor`	$\rfloor$	`\rfloor`	$\lceil$	`\lceil`	$\rceil$	`\rceil`
$\langle$	`\langle`	$\rangle$	`\rangle`	$/$	`/`	$\backslash$	`\backslash`
$\vert$	`|`	$\Vert$	`\\|`				

Table 9: Delimiters

$\rmoustache$	`\rmoustache`	$\lmoustache$	`\lmoustache`	$\rgroup$	`\rgroup`	$\lgroup$	`\lgroup`
$\arrowvert$	`\arrowvert`	$\Arrowvert$	`\Arrowvert`	$\bracevert$	`\bracevert`		

Table 10: Large Delimiters

$\hat{a}$	`\hat{a}`	$\acute{a}$	`\acute{a}`	$\bar{a}$	`\bar{a}`	$\dot{a}$	`\dot{a}`	$\breve{a}$	`\breve{a}`
$\check{a}$	`\check{a}`	$\grave{a}$	`\grave{a}`	$\vec{a}$	`\vec{a}`	$\ddot{a}$	`\ddot{a}`	$\tilde{a}$	`\tilde{a}`

Table 11: Math mode accents

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

Table 12: Some other constructions

$\boxdot$	\boxdot	$\boxplus$	\boxplus	$\boxtimes$	\boxtimes	$\square$	\square
$\blacksquare$	\blacksquare	$\centerdot$	\centerdot	$\lozenge$	\lozenge	$\blacklozenge$	\blacklozenge
$\circlearrowright$	\circlearrowright	$\circlearrowleft$	\circlearrowleft	$\rightleftharpoons$	\rightleftharpoons	$\leftrightharpoons$	\leftrightharpoons
$\boxminus$	\boxminus	$\Vdash$	\Vdash	$\Vvdash$	\Vvdash	$\vDash$	\vDash
$\twoheadrightarrow$	\twoheadrightarrow	$\twoheadleftarrow$	\twoheadleftarrow	$\leftleftarrows$	\leftleftarrows	$\rightrightarrows$	\rightrightarrows
$\upuparrows$	\upuparrows	$\downdownarrows$	\downdownarrows	$\upharpoonright$	\upharpoonright	$\downharpoonright$	\downharpoonright
$\upharpoonleft$	\upharpoonleft	$\downharpoonleft$	\downharpoonleft	$\rightarrowtail$	\rightarrowtail	$\leftarrowtail$	\leftarrowtail
$\leftrightarrows$	\leftrightarrows	$\rightleftarrows$	\rightleftarrows	$\Lsh$	\Lsh	$\Rsh$	\Rsh
$\rightsquigarrow$	\rightsquigarrow	$\leftrightsquigarrow$	\leftrightsquigarrow	$\looparrowleft$	\looparrowleft	$\looparrowright$	\looparrowright
$\circeq$	\circeq	$\succsim$	\succsim	$\gtrsim$	\gtrsim	$\gtrapprox$	\gtrapprox
$\multimap$	\multimap	$\therefore$	\therefore	$\because$	\because	$\doteqdot$	\doteqdot
$\triangleq$	\triangleq	$\precsim$	\precsim	$\lesssim$	\lesssim	$\lessapprox$	\lessapprox
$\eqslantless$	\eqslantless	$\eqslantgtr$	\eqslantgtr	$\curlyeqprec$	\curlyeqprec	$\curlyeqsucc$	\curlyeqsucc
$\preccurlyeq$	\preccurlyeq	$\leqq$	\leqq	$\leqslant$	\leqslant	$\lessgtr$	\lessgtr
$\backprime$	\backprime	$\risingdotseq$	\risingdotseq	$\fallingdotseq$	\fallingdotseq	$\succcurlyeq$	\succcurlyeq
$\geqq$	\geqq	$\geqslant$	\geqslant	$\gtrless$	\gtrless	$\sqsubset$	\sqsubset
$\sqsupset$	\sqsupset	$\vartriangleright$	\vartriangleright	$\vartriangleleft$	\vartriangleleft	$\trianglerighteq$	\trianglerighteq
$\trianglelefteq$	\trianglelefteq	$\bigstar$	\bigstar	$\between$	\between	$\blacktriangledown$	\blacktriangledown
$\blacktriangleright$	\blacktriangleright	$\blacktriangleleft$	\blacktriangleleft	$\vartriangle$	\vartriangle	$\blacktriangle$	\blacktriangle
$\triangledown$	\triangledown	$\eqcirc$	\eqcirc	$\lesseqgtr$	\lesseqgtr	$\gtreqless$	\gtreqless
$\lesseqqgtr$	\lesseqqgtr	$\gtreqqless$	\gtreqqless	$\Rrightarrow$	\Rrightarrow	$\Lleftarrow$	\Lleftarrow
$\veebar$	\veebar	$\barwedge$	\barwedge	$\doublebarwedge$	\doublebarwedge	$\angle$	\angle
$\measuredangle$	\measuredangle	$\sphericalangle$	\sphericalangle	$\varpropto$	\varpropto	$\smallsmile$	\smallsmile
$\smallfrown$	\smallfrown	$\Subset$	\Subset	$\Supset$	\Supset	$\Cup$	\Cup
$\Cap$	\Cap	$\curlywedge$	\curlywedge	$\curlyvee$	\curlyvee	$\leftthreetimes$	\leftthreetimes
$\rightthreetimes$	\rightthreetimes	$\subseteqq$	\subseteqq	$\supseteqq$	\supseteqq	$\bumpeq$	\bumpeq
$\Bumpeq$	\Bumpeq	$\lll$	\lll	$\ggg$	\ggg	$\circledS$	\circledS
$\pitchfork$	\pitchfork	$\dotplus$	\dotplus	$\backsim$	\backsim	$\backsimeq$	\backsimeq
$\complement$	\complement	$\intercal$	\intercal	$\circledcirc$	\circledcirc	$\circledast$	\circledast
$\circleddash$	\circleddash	$\ulcorner$	\ulcorner	$\urcorner$	\urcorner	$\llcorner$	\llcorner
$\lrcorner$	\lrcorner	$\yen$	\yen	$\checkmark$	\checkmark	$\circledR$	\circledR
$\maltese$	\maltese	$\lvertneqq$	\lvertneqq	$\gvertneqq$	\gvertneqq	$\nleq$	\nleq
$\ngeq$	\ngeq	$\nless$	\nless	$\ngtr$	\ngtr	$\nprec$	\nprec
$\nsucc$	\nsucc	$\lneqq$	\lneqq	$\gneqq$	\gneqq	$\nleqslant$	\nleqslant
$\ngeqslant$	\ngeqslant	$\lneq$	\lneq	$\gneq$	\gneq	$\npreceq$	\npreceq
$\nsucceq$	\nsucceq	$\precnsim$	\precnsim	$\succnsim$	\succnsim	$\lnsim$	\lnsim
$\gnsim$	\gnsim	$\nleqq$	\nleqq	$\ngeqq$	\ngeqq	$\precneqq$	\precneqq
$\succneqq$	\succneqq	$\precnapprox$	\precnapprox	$\succnapprox$	\succnapprox	$\lnapprox$	\lnapprox
$\gnapprox$	\gnapprox	$\nsim$	\nsim	$\napprox$	\napprox	$\varsubsetneq$	\varsubsetneq
$\varsupsetneq$	\varsupsetneq	$\nsubseteqq$	\nsubseteqq	$\nsupseteqq$	\nsupseteqq	$\subsetneqq$	\subsetneqq
$\supsetneqq$	\supsetneqq	$\varsubsetneqq$	\varsubsetneqq	$\varsupsetneqq$	\varsupsetneqq	$\subsetneq$	\subsetneq
$\supsetneq$	\supsetneq	$\nsubseteq$	\nsubseteq	$\nsupseteq$	\nsupseteq	$\nparallel$	\nparallel
$\nmid$	\nmid	$\nshortmid$	\nshortmid	$\nshortparallel$	\nshortparallel	$\nvdash$	\nvdash
$\nVdash$	\nVdash	$\nvDash$	\nvDash	$\nVDash$	\nVDash	$\ntrianglerighteq$	\ntrianglerighteq
$\ntrianglelefteq$	\ntrianglelefteq	$\ntriangleleft$	\ntriangleleft	$\ntriangleright$	\ntriangleright	$\nleftarrow$	\nleftarrow
$\nrightarrow$	\nrightarrow	$\nLeftarrow$	\nLeftarrow	$\nRightarrow$	\nRightarrow	$\nLeftrightarrow$	\nLeftrightarrow
$\nleftrightarrow$	\nleftrightarrow	$\divideontimes$	\divideontimes	$\varnothing$	\varnothing	$\nexists$	\nexists
$\mho$	\mho	ð	\thorn	$\beth$	\beth	$\gimel$	\gimel
$\daleth$	\daleth	$\lessdot$	\lessdot	$\gtrdot$	\gtrdot	$\ltimes$	\ltimes
$\rtimes$	\rtimes	$\shortmid$	\shortmid	$\shortparallel$	\shortparallel	$\smallsetminus$	\smallsetminus
$\thicksim$	\thicksim	$\thickapprox$	\thickapprox	$\approxeq$	\approxeq	$\succapprox$	\succapprox
$\precapprox$	\precapprox	$\curvearrowleft$	\curvearrowleft	$\curvearrowright$	\curvearrowright	$\digamma$	\digamma
$\varkappa$	\varkappa	$\hslash$	\hslash	$\hbar$	\hbar	$\backepsilon$	\backepsilon

$A\ B\ C\ D\ E\ F$ \Bbb A \Bbb B ...

Table 13: AMS symbols