

# AMST<sub>E</sub>X Reference Card

(See the T<sub>E</sub>X Reference Card for further commands)

## Formatting

<code>\pagewidth{&lt;dimen&gt;}</code>	set page width
<code>\pageheight{&lt;dimen&gt;}</code>	set page height
<code>\hcorrection{&lt;dimen&gt;}</code>	move page right
<code>\vcorrection{&lt;dimen&gt;}</code>	move page down
<code>\flushpar</code>	start a paragraph with no indentation
<code>\boxed#1</code>	boxed formula
<code>\NoBlackBoxes</code>	omit overfull hbox markers
<code>\comment ... \endcomment</code>	unprinted comments
<code>\pageno#1</code>	set page number
<code>\nopagenumbers</code>	turn off page numbering if not using <code>amspt</code> style

## Fonts

### Text Fonts

<code>\rm</code>	roman
<code>\it</code>	italic
<code>\bf</code>	boldface
<code>\sl</code>	slant
<code>\smc</code>	small capitals

### Math Mode Fonts

<code>\bold#1</code>	bold letter
<code>\loadbold</code>	load bold math symbols
<code>\boldkey#1</code>	bold keyboard symbol
<code>\boldsymbol#1</code>	bold math symbol (e.g. <code>\alpha</code> )
<code>\Cal#1</code>	caligraphic (script) upper case
<code>\frak#1</code>	German Fraktur
<code>\goth#1</code>	German Fraktur (same as <code>\frak</code> )
<code>\Bbb#1</code>	blackboard bold
<code>\rom#1</code>	Roman

### Loading Fonts & Symbols (if not using `amspt` style)

<code>\loadmsam</code>	load <code>msam</code> symbol font
<code>\loadmsbm</code>	load <code>msbm</code> symbol font
<code>\UseAMSsymbols</code>	define all symbols from <code>msam</code> , <code>msbm</code> fonts
<code>\newsymbol</code>	define a particular symbol

### Changing Font Sizes

<code>\tenpoint</code>	use 10 point fonts
<code>\eightpoint</code>	use 8 point fonts
<code>\dsize</code>	use display size
<code>\tsize</code>	use text size
<code>\ssize</code>	use subscript size
<code>\sssize</code>	use subsubscript size

## Macro Definitions

<code>\define\cs{...}</code>	define a control sequence
<code>\redefine\cs{...}</code>	redefine a control sequence
<code>\predefine\newcs{\oldcs}</code>	assign new name to a control seq
<code>\operatorname#1</code>	new operator name
<code>\operatornamewithlimits#1</code>	new operator name with limits
<code>\newsymbol</code>	new symbol from <code>msam</code> , <code>msbm</code> fonts

## Footnotes and Insertions

<code>\footnote#1</code>	footnote
<code>\footnote"*#1</code>	footnote with specified marker
<code>\topinsert ... \endinsert</code>	insert at top of page
<code>\midinsert ... \endinsert</code>	insert in middle of page
<code>\topcaption#1 ... \endcaption</code>	caption at top of insert
<code>\botcaption#1 ... \endcaption</code>	caption at bottom of insert
<code>\vspace{&lt;dimen&gt;}</code>	leave vertical space in an insert

## Hyphenation

<code>\showhyphens#1</code>	show allowable hyphens
<code>\-</code>	discretionary hyphen
<code>\hyphenation#1</code>	add words to hyphenation list

## Fractions and Such

<code>\frac#1#2</code>	fraction
<code>\dfrac#1#2</code>	display size fraction
<code>\tfrac#1#2</code>	text size fraction
<code>\fracwithdelims()#1#2</code>	fraction with paren. delimiters
<code>\binom#1#2</code>	binomial coefficient
<code>\dbinom#1#2</code>	display size binomial coefficient
<code>\tbinom#1#2</code>	text size binomial coefficient
<code>\underset#1\to#2</code>	typeset #1 under #2
<code>\overset#1\to#2</code>	typeset #1 over #2
<code>\overbrace#1^#2</code>	overbrace with label above
<code>\underbrace#1_#2</code>	underbrace with label below
<code>\sideset~#1\and~#2\to\bigop</code>	superscripts on side of operator
<code>\cfrac ... \endcfrac</code>	continued fraction
<code>\lrcfrac ... \endcfrac</code>	continued fraction flush left
<code>\rcfrac ... \endcfrac</code>	continued fraction flush right

## Arrows & Commutative Diagrams

<code>@&gt;#1&gt;#2&lt;</code>	right arrow with labels
<code>@&lt;#1&lt;#2&lt;</code>	left arrow with labels
<code>\CD ... \endCD</code>	commutative diagram (don't use &'s)
<code>@V#1V#2V</code>	down arrow with labels
<code>@A#1A#2A</code>	up arrow with labels
<code>@=</code>	long horizontal = sign
<code>@ </code>	long vertical equal sign
<code>@.</code>	leave out an arrow
<code>\pretend#1\haswidth#2</code>	make arrows longer

## Accents

Type	Example	In Math	In Text
hat	$\hat{a}$	<code>\hat</code>	<code>\^</code>
expanding hat	$\widehat{abc}$	<code>\widehat</code>	none
check	$\check{a}$	<code>\check</code>	<code>\v</code>
tilde	$\tilde{a}$	<code>\tilde</code>	<code>\~</code>
expanding tilde	$\widetilde{abc}$	<code>\widetilde</code>	none
acute	$\acute{a}$	<code>\acute</code>	<code>\'</code>
grave	$\grave{a}$	<code>\grave</code>	<code>\`</code>
dot	$\dot{a}$	<code>\dot</code>	<code>\D</code>
double dot	$\ddot{a}$	<code>\ddot</code>	<code>\"</code>
breve	$\breve{a}$	<code>\breve</code>	<code>\u</code>
bar	$\bar{a}$	<code>\bar</code>	<code>\B</code>
vector	$\vec{a}$	<code>\vec</code>	none
cedilla	$\c{c}$	none	<code>\c</code>

## Dimensions

Dimensions are specified as `<number><unit of measure>`.

point	pt	pica	pc	inch	in	centimeter	cm
m width	em	x height	ex	math unit	mu	millimeter	mm
1 pc = 12 pt		1 in = 72.72 pt		2.54 cm = 1 in		18 mu = 1 em	

## Spacing and Dots

<code>\linebreak</code>	force a line break
<code>\newline</code>	force a new line, old line pushed left
<code>\mathbreak</code>	force line break
<code>\allowmathbreak</code>	allow line break
<code>\-</code>	discretionary hyphen
<code>\.</code>	abbreviation period
<code>\,</code> or <code>\thinspace</code>	thin space
<code>\medspace</code>	medium space
<code>;</code> or <code>\thickspace</code>	thick space
<code>!</code> or <code>\negthinspace</code>	negative thin space
<code>\negmedspace</code>	negative medium space
<code>\negthickspace</code>	negative thick space
<code>\quad</code>	quad space
<code>\qquad</code>	double quad space
<code>%</code>	comment line
<code>\</code>	one blank space
<code>\phantom#1</code>	blank space size of #1
<code>\hphantom#1</code>	blank space width of #1, no height
<code>\vphantom#1</code>	blank space height of #1, no width
<code>\smash#1</code>	ignore height and depth
<code>\topsmash#1</code>	ignore height
<code>\botsmash#1</code>	ignore depth
<code>\mathstrut</code>	strut to help vertical spacing
<code>\smallpagebreak</code>	small space between paragraphs
<code>\medpagebreak</code>	medium space between paragraphs
<code>\bigpagebreak</code>	big space between paragraphs
<code>\pagebreak</code>	force a page break
<code>\nopagebreak</code>	forbid a page break
<code>\newpage</code>	force a page break fill page with blank space
<code>\hdots</code>	horizontal dots
<code>\vdots</code>	vertical dots
<code>\ddots</code>	diagonal dots
<code>\dots</code>	dots in text or formulas
<code>\ldots</code>	low dots in text or formulas
<code>\cdots</code>	center dots in text or formulas

## Miscellaneous Operations

<code>\bmod#1</code>	mod as binary operation
<code>\pmod#1</code>	mod with parentheses
<code>\mod#1</code>	same as <code>pmod</code> , but no parens
<code>\pod#1</code>	parentheses, but no "mod"
<code>\sqrt#1</code>	square root
<code>\root#1\of#2</code>	root
<code>\uproot{&lt;number&gt;}</code>	move root up/down
<code>\leftroot{&lt;number&gt;}</code>	move root left/right
<code>\iiint</code>	two integral signs
<code>\iiiint</code>	three integral signs
<code>\idotsint</code>	integral signs with dots

## AMS Preprint Style

```

\input amstex
\documentstyle{amsppt}
  (Preamble Commands)
\topmatter
  (Top Matter Commands)
\endtopmatter
\document
  (Body of Document)
\enddocument

Preamble Commands
\TagsOnLeft (default) or \TagsOnRight
\TagsAsText (default) or \TagsAsMath
\NoPageNumbers
\NoRunningHeads
\Monograph
\define

Top Matter Commands
\title ...\endtitle
\author ...\endauthor
\affil ...\endaffil
\address ...\endaddress
\curraddr ...\endcurraddr
\email ...\endemail
\date ...\enddate
\dedicatory ...\enddedicatory
\thanks ...\endthanks
\translator ...\endtranslator
\keywords ...\endkeywords
\subjclass ...\endsubjclass
\abstract ...\endabstract
\toc ...\endtoc (Table of Contents)
\leftheadtext#1 (set left headline text)
\rightheadtext#1 (set right headline text)

Body of Paper Commands
\specialhead ...\endspecialhead
\head ...\endhead
\subhead ...\endsubhead
\subsubhead ...\endsubsubhead
\proclaim#1 ...\endproclaim
\rom#1 (Roman font in proclaim)
\demo#1 ...\enddemo (proof)
\qed (end of proof marker)
\roster ...\endroster (roster of listed items)
  \item (start a new item in a roster)
  \item[(number)] (specify roster item number)
  \item*" (item with specified marker)
  \therosteritem#1 (refer to specified roster item)
  \widestnumber\item#1 (set width for roster labels)
\nofrills (turn off automatic font, spacing, punctuation)
\usualspace (usual space following punctuation)
\definition#1 ...\enddefinition
\example#1 ...\endexample
\remark#1 ...\endremark
\block ...\endblock (indented text)
\cite (cite a reference)

```

## AMS Preprint Style — References

```

\Refs ...\endRefs list of references
\refstyle#1 specify style A, B, or C
  A = initials, B = name, C = number

\ref ...\endref individual reference
\no or \key number or key for reference
  \widestnumber\no#1 or \widestnumber\key#1
\by author
  \bysame same as previous author
\paper name of paper
\vol volume
\yr year of publication
\jour journal
\page or \pages page(s)
\toappear to appear
\inbook article in a book
\moreref additional reference information
\paperinfo extra information after paper title
\procinfo information about proceedings
\issue issue number
\lang language
\transl information about translated version
\book book
\ed or \eds editor(s)
\publ publisher
\publaddr publisher address
\bookinfo extra information after book title
\finalinfo extra information for end
\miscnote same as \finalinfo, in parens.

```

## Overlines and Underlines

```

\underline#1 underline
\overline#1 overline
\overarrow#1 over right arrow
\underarrow#1 under right arrow
\overleftarrow#1 over left arrow
\underleftarrow#1 under left arrow
\overlefttriarrow#1 over left-right arrow

```

## Delimiters

```

[ \lbrack or \l { \lbrace or \{ < \langle
] \rbrack or \r } \rbrace or \} > \rangle
| \vert or \l | \lfloor or \lceil
|| \Vert or \l | \rfloor or \rceil
↑ \uparrow ↑ \Uparrow ↓ \updownarrow
↓ \downarrow ↓ \Downarrow ⇕ \Updownarrow
[[ \l[ [ ( \l( ( \langle!\rangle
]] \r] ] ) \r) \rangle!\rangle
\left#1 \right#1 expanding delimiters
\left. \right. empty delimiters
\bigl#1 \bigr#1 big delimiters
\Bigl#1 \Bigr#1 bigger delimiters
\biggl#1 \biggr#1 even bigger delimiters

```

## Non-Italic Function Names

```

\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

```

## Alignments and Displayed Equations

```

\\ separate lines
& separate items in a line
\align ...\endalign align equations, full
  width of page
\alignat#1 ...\endalignat align #1 pairs
  \xalignat#1 ...\endxalignat equally spaced
  \xxalignat#1 ...\endxxalignat equally spaced, flush
\aligned ...\endaligned align equations, width
  as needed
  \alignedat#1 ...\endalignedat align #1 pairs
  \topaligned ...\endtopaligned align along top
  \botaligned ...\endbotaligned align along bottom
\gather ...\endgather centered equations, full
  width of page
\gathered ...\endgathered centered equations,
  width as needed
\multline ...\endmultline first line left, middle lines
  centered, last line right
  \shoveleft#1 shove lines left
  \shoveright#1 shove lines right
  \multlinegap{(dimen)} change margins
\cases ...\endcases case construction
\split ...\endsplit align split equations with
  variable tag placement
\Sb ...\endSb multi-line subscript
\Sp ...\endSp multi-line superscript
\text#1 text within formula
\intertext#1 text between lines
\foldedtext#1 lines of text in formula
  \topfoldedtext#1 top-aligned folded text
  \botfoldedtext#1 bottom-aligned folded text
  \foldedwidth{(dimen)} set width of folded text
\allowdisplaybreak allow page break after line
\allowdisplaybreaks allow page breaks after any line
\displaybreak force page break after line
\vspace{(dimen)} extra space between two lines
\spreadlines{(dimen)} extra space between every line
  same for a matrix
\jot unit of vertical space
\tag#1 tag for a formula
  \thetag#1 refer to tag in current style
  \tag"*" tag exactly as specified

```

## Matrices

```

\matrix ...\endmatrix matrix alignment
\pmatrix ...\endpmatrix matrix with parentheses
\bmatrix ...\endbmatrix matrix with brackets
\vmatrix ...\endvmatrix matrix with vertical lines
\Vmatrix ...\endVmatrix matrix with double vertical lines
\smallmatrix ...\endsmallmatrix small matrix
\format specify a format for a matrix
  \c \l \r format entry center, left, right

```

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