

# 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 amsppt 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. $\alpha$ )
<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 amsppt style)

<code>\loadmsam</code>	load msam symbol font
<code>\loadmsbm</code>	load msbm symbol font
<code>\UseAMSsymbols</code>	define all symbols from msam, msbm 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 msam, msbm 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 ... \endlrcfrac</code>	continued fraction flush left
<code>\rccfrac ... \endrcfrac</code>	continued fraction flush right

## Arrows & Commutative Diagrams

<code>\r@&gt;#1&gt;#2&gt;</code>	right arrow with labels
<code>\l@&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	$\c{a}$	none	<code>\c</code>

## Dimensions

Dimensions are specified as  $\langle \text{number} \rangle \langle \text{unit of measure} \rangle$ .

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 pmod, 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 ... \endeddicatory`  
`\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  
`\proinfo` 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  
`\overlefttriarow#1` over left-right arrow

## Delimiters

[	\lbrack or \l	{	\lbrace or \{	<	\langle
]	\rbrack or \r	}	\rbrace or \}	>	\rangle
	\vert or \l		\lfloor		\lceil
	\Vert or \l		\rfloor		\rceil
↑	\uparrow	↑	\Uparrow	↓	\Downarrow
↓	\downarrow	↓	\Downarrow	⇕	\Updownarrow
[[	[\!	((	(\!	⟨⟨	\langle!\langle
]]	]\!	)	)\!	⟩⟩	\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  
    `\xalignat#1 ... \endxalignat` 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  
`\spreadmatrixlines{<dimen>}` 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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