Math-Symbols-in-LaTeX-Manual

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Contents

1 Constants and Useful Symbols

i	\mi	$\mathbb{N}$	\mnatr	$\mathbb{C}$	\mcmpx	$C[a,b]$	\mscab	$L^m([a,b])$ \mslbg[{[a, b]}]{m}
j	\mj	$\mathbb{Z}$	\mintg	$\mathbb{H}$	\mhilb	$C(I)$	\mscon{(I)}	$H^m([a,b])$ \mssbl[{[a, b]}]{m}
e	\me	$\mathbb{Q}$	\mrato	Cond.	\mcond	$L^2(I)$	\mslbg{2}	
		$\mathbb{R}$	\mreal	const	\mconst	$H^2(I)$	\mssbl{2}	

2 Vector and Matrix Defination

2.1 Vector Notations

a	\mva	j	\mvj	s	\mvs	α	\mvalpha	κ	\mvkappa	υ	\mvupsilon
b	\mvb	k	\mvk	t	\mvt	β	\mvbeta	λ	\mvlambda	ϕ	\mvphi
c	\mvc	l	\mvl	u	\mvu	γ	\mvgamma	μ	\mvmu	χ	\mvchi
d	\mvd	m	\mvm	v	\mvv	δ	\mvdelta	ν	\mvnu	ψ	\mvpsi
e	\mve	n	\mvn	w	\mvw	ϵ	\mvepsilon	ξ	\mvxi	ω	\mvomega
f	\mvf	o	\mvo	x	\mvx	ζ	\mvzeta	π	\mvpi		
g	\mvg	p	\mvp	y	\mvy	η	\mveta	ρ	\mvrho		
h	\mvh	q	\mvq	z	\mvz	θ	\mvtheta	σ	\mvsigma		
i	\mvi	r	\mvr			ι	\mviota	τ	\mvtau		

2.2 Matrix Notations

A	\mma	**G**	\mmg	**M**	\mmm	**S**	\mms	**Y**	\mmy	Γ	\mmgamma	Σ	\mmsigma
B	\mmb	**H**	\mmh	**N**	\mmn	**T**	\mmt	**Z**	\mmz	Δ	\mmdelta	Υ	\mmupsilon
C	\mmc	**I**	\mmi	**O**	\mmo	**U**	\mmu			Θ	\mmtheta	Φ	\mmphi
D	\mmd	**J**	\mmj	**P**	\mmp	**V**	\mmv			Λ	\mmlambda	Ψ	\mmpsi
E	\mme	**K**	\mmk	**Q**	\mmq	**W**	\mmw			Ξ	\mmxi	Ω	\mmomega
F	\mmf	**L**	\mml	**R**	\mmr	**X**	\mmx			Π	\mmpi		

2.3   Transposed Matrix Notations

$\mathbf{A}^T$	`\mmat`	$\mathbf{H}^T$	`\mmht`	$\mathbf{O}^T$	`\mmot`	$\mathbf{V}^T$	`\mmvt`	$\boldsymbol{\Gamma}^T$	`\mmgammat`	$\boldsymbol{\Upsilon}^T$	`\mmupsilont`
$\mathbf{B}^T$	`\mmbt`	$\mathbf{I}^T$	`\mmit`	$\mathbf{P}^T$	`\mmpt`	$\mathbf{W}^T$	`\mmwt`	$\boldsymbol{\Delta}^T$	`\mmdeltat`	$\boldsymbol{\Phi}^T$	`\mmphit`
$\mathbf{C}^T$	`\mmct`	$\mathbf{J}^T$	`\mmjt`	$\mathbf{Q}^T$	`\mmqt`	$\mathbf{X}^T$	`\mmxt`	$\boldsymbol{\Theta}^T$	`\mmthetat`	$\boldsymbol{\Psi}^T$	`\mmpsit`
$\mathbf{D}^T$	`\mmdt`	$\mathbf{K}^T$	`\mmkt`	$\mathbf{R}^T$	`\mmrt`	$\mathbf{Y}^T$	`\mmyt`	$\boldsymbol{\Lambda}^T$	`\mmlambdat`	$\boldsymbol{\Omega}^T$	`\mmomegat`
$\mathbf{E}^T$	`\mmet`	$\mathbf{L}^T$	`\mmlt`	$\mathbf{S}^T$	`\mmst`	$\mathbf{Z}^T$	`\mmzt`	$\boldsymbol{\Xi}^T$	`\mmxit`		
$\mathbf{F}^T$	`\mmft`	$\mathbf{M}^T$	`\mmmt`	$\mathbf{T}^T$	`\mmtt`			$\boldsymbol{\Pi}^T$	`\mmpit`		
$\mathbf{G}^T$	`\mmgt`	$\mathbf{N}^T$	`\mmnt`	$\mathbf{U}^T$	`\mmut`			$\boldsymbol{\Sigma}^T$	`\mmsigmat`		

2.4   Tensor Notations

A	`\mta`	B	`\mtb`	C	`\mtc`	D	`\mtd`	E	`\mte`	F	`\mtf`	G	`\mtg`
H	`\mth`	I	`\mti`	J	`\mtj`	K	`\mtk`	L	`\mtl`	M	`\mtm`	N	`\mtn`
O	`\mto`	P	`\mtp`	Q	`\mtq`	R	`\mtr`	S	`\mts`	T	`\mtt`		
U	`\mtu`	V	`\mtv`	W	`\mtw`	X	`\mtx`	Y	`\mty`	Z	`\mtz`		

2.5   Special Vector and Matrix Notations

$\mathbf{0}$ `\mvzero` $\mathbf{1}$ `\mvone` $\mathbf{0}$ `\mmzero` $\mathbf{1}$ `\mmone`

3   Useful Functions and Operators

d	`\diff`	diag	`\diag`	lcm	`\lcm`	var	`\var`	argmin	`\argmin`	card	`\card`
D	`\Diff`	eig	`\eig`	rand	`\rand`	corr	`\corr`	argmax	`\argmax`	dist	`\dist`
E	`\Expect`	tr	`\tr`	mean	`\mean`	conv	`\conv`	argopt	`\argopt`		

4   Useful Aliases and Generators

- `\fracdiff{}{}`: frac & diff operator, also provide `\dfracdiff{}{}` mode. For example, `\fracdiff{u}{x}` gets $\frac{\mathrm{d}u}{\mathrm{d}x}$, `\dfracdiff{^2u}{x^2}` gets $\dfrac{\mathrm{d}^2u}{\mathrm{d}x^2}$

- `\fracdiffs{}`: special frac & diff operator. For example, `\fracdiffs{x}` gets $\frac{\mathrm{d}}{\mathrm{d}x}$, `\dfracdiffs{y}` gets $\dfrac{\mathrm{d}}{\mathrm{d}y}$

- `\fracpartial{}{}`: frac & partial operator, also provide `\dfracpartial{}{}` mode. For example, `\fracpartial{u}{x}` gets $\frac{\partial u}{\partial x}$, `\dfracpartial{^2u}{x^2}` gets $\dfrac{\partial^2 u}{\partial x^2}$

- `\fracpartials{}`: special frac & partial operator. For example, `\fracpartials{x}` gets $\frac{\partial}{\partial x}$, `\dfracpartials{y}` gets $\dfrac{\partial}{\partial y}$

- `\mclosure{}`, `\mclosuresquare{}`, `\mclosurebrace{}`: auto height brackets, eg $\left\{\left[\left(a^2+b^2\right)^2\right]^2\right\}$

- `\mfwhen{}{}`: create a symbol $\big|$, eg `\mfwhen{\fracpartial{u}{t}}{x=5}` gets $\left.\frac{\partial u}{\partial t}\right|_{x=5}$

- `\mvct{}{}`, `\mvctz{}{}`: row vector creator, eg `\mvct{a}{n}` gets $(a_1, a_2, \ldots, a_n)$, `\mvctz{a}{n}` gets $(a_0, a_1, \ldots, a_n)$

- `\mvctt{}{}`, `\mvctzt{}{}`: column vector creator, eg `\mvctt{a}{n}` gets $(a_1, a_2, \ldots, a_n)^T$, `\mvctzt{a}{n}` gets $(a_0, a_1, \ldots, a_n)^T$

- `\mequlist{}`: provided a list of equations, eg `\mequlist{x + y \&= 10 \\ 4x + 2y \&= 30}` gets $\begin{cases} x+y=10 \\ 4x+2y=30 \end{cases}$, also provide environment `equlist`, which is similar with the `cases` environment