CONTENTS

# Math-Symbols-in-LATEX-Manual

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Version: v2.0, Last Update: May 15, 2018

 $Insert \verb|\usepackage{math-symbols}| in your document's preamble.$ 

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1	Con	sta	nts aı	$\mathbf{d}$	Usefu	ıl S	ymbo	ols											
i j e	\mi \mj \me	\mj ℤ \mintg ℍ			\m nd. \m	ncmpx hilb ncond	$C(I)$ $L^2(I)$	) [)	\mscal \mscol \mslb \mssb	n{(I) g{2}		$L^m([a,b])$ $H^m([a,b])$						]}]{m] ]}]{m]	
$\frac{2}{2.1}$			and I		trix I	Defi	natio	n											
<i>a</i>	\mva	j	\mvj	s	\mvs	$\alpha$	\mvalpH	าว	$\kappa$	\mvka	anna	v	\ m\/Lir	nci	lon				
b	\mvb	$egin{array}{c} J \ k \end{array}$	\mvk	t	\mvt	$\beta$	\mvbeta		$\lambda$		ambda				mvupsilon mvphi				
c	\mvc	l	\mv1	$\boldsymbol{u}$	\mvu	$\gamma$	\mvgamr		$\mu$	\mvmi		$\overset{\tau}{\chi}$	\mvch						
d	\mvd	m	\mvm	$oldsymbol{v}$	\mvv	$\overset{'}{\delta}$	\mvdelt		$\nu$	\mvni		$\overset{\sim}{\psi}$	\mvps	si					
e	\mve	$\boldsymbol{n}$	\mvn	$oldsymbol{w}$	\mvw	$\epsilon$	\mveps:	ilor	ı ξ	\mvx:	i	$\dot{oldsymbol{\omega}}$	\mvor		a				
f	\mvf	0	\mvo	$oldsymbol{x}$	\mvx	$\zeta$	\mvzeta	а	$\pi$	\mvp:	i								
$\boldsymbol{g}$	\mvg	$oldsymbol{p}$	\mvp	$\boldsymbol{y}$	\mvy	$\eta$	\mveta		$oldsymbol{ ho}$	\mvrl	าด								
h	\mvh	$oldsymbol{q}$	\mvq	$\boldsymbol{z}$	\mvz	$oldsymbol{ heta}$	\mvthet	ta	$\sigma$	\mvs:	igma								
i	\mvi	r	\mvr			$\iota$	\mviota	а	au	\mvta	au								
2.2	Ma	trix	Notat	ions	;														
$\mathbf{A}$	\mma	$\mathbf{G}$	\mmg	${f M}$	\mmm	$\mathbf{S}$	\mms	$\mathbf{Y}$	\mmy	$\Gamma$	\mmg	amma	$oldsymbol{\Sigma}$	\	mms	igma			
В	\mmb		\mmh	$\mathbf{N}$	\mmn	${f T}$	\mmt	${f Z}$	\mmz			lelta	Υ			psil	on		
$\mathbf{C}$	\mmc		\mmi	Ο	\mmo	$\mathbf{U}$	\mmu			Θ	\mmtheta		$\Phi$	\	mmp	hi			
D	\mmd		\mmj	$\mathbf{P}$	\mmp	$\mathbf{V}$	\mmv			$oldsymbol{\Lambda}$		ambda		\	mmp	si			
${f E}$	\mme		\mmk	${f Q}$	\mmq	$\mathbf{W}$	\mmw			Ξ	\mmx		$oldsymbol{\Omega}$	\	mmo	mega			
$\mathbf{F}$	\mmf	${f L}$	$\mbox{mm1}$	${f R}$	\mmr	${f X}$	\mmx			Π	\mmp	i							

### 2.3 Transposed Matrix Notations

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

#### 2.4 Tensor Notations

```
Α
           В
               \mtb
                      C
                           \mtc
                                       \mtd
                                              Ε
                                                  \mte
                                                         F
                                                              \mtf
                                                                         \mtg
Η
    \mth
               \mti
                                  Κ
                                       \mtk
                                              L
           ı
                      J
                           \mtj
                                                  \mtl
                                                         Μ
                                                              \mtm
                                                                         \mtn
0
    \mto
           Ρ
               \mtp
                      Q
                           \mtq
                                  R
                                       \mtr
                                              S
                                                  \mts
                                                         Τ
                                                              \mtt
                                              Υ
                                                         Ζ
U
    \mtu
               \mtv
                           \mtw
                                  Χ
                                       \mtx
                                                  \mty
                                                              \mtz
```

### 2.5 Special Vector and Matrix Notations

```
0 \mvzero 1 \mvone 0 \mmzero 1 \mmone
```

## 3 Useful Functions and Operators

```
d
    \diff
               diag
                      \diag
                                                                           \argmin
                               lcm
                                       \lcm
                                                        \var
                                                                 argmin
                                                                                      card
                                                                                             \card
D
    \Diff
                                                                                             \dist
               eig
                       \eig
                               rand
                                       \rand
                                                        \corr
                                                                argmax
                                                                           \argmax
                                                                                      dist
                                                corr
\mathbf{E}
    \Expect
                       \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  $\frac{du}{dx}$ , \dfracdiff{^2u}{x^2} gets  $\frac{d^2u}{dx^2}$
- \fracdiffs{}: special frac & diff operator. For example, \fracdiffs{x} gets  $\frac{d}{dx}$ , \dfracdiffs{y} gets  $\frac{d}{dy}$
- \fracpartial{}{}: frac & partial operator, also provide \dfracpartial{}{} mode. For example, \fracpartial{u}{x} gets  $\frac{\partial u}{\partial x}$ , \dfracpartial{^2u}{x^2} gets  $\frac{\partial^2 u}{\partial x^2}$
- \fracpartials{}: special frac & partial operator. For example, \fracpartials{x} gets  $\frac{\partial}{\partial x}$ , \delta dfracpartials{y} gets  $\frac{\partial}{\partial y}$
- \mclosure{}, \mclosuresquare{}, \mclosurebrace{}: auto height brackets, eg  $\left\{ \left[ \left( a^2 + b^2 \right)^2 \right]^2 \right\}$
- \mfwhen{}{}: create a symbol |, eg \mfwhen{\fracpartial{u}{t}} $\{x$ =5} gets  $\frac{\partial u}{\partial t}\Big|_{x=5}$
- \mvct{}{}, \mvctz{}{}: row vector creator, eg \mvct{a}{n} gets  $(a_1, a_2, ..., a_n)$ , \mvctz{a}{n} gets  $(a_0, a_1, ..., a_n)$
- \mvctt{}{}, \mvctzt{}{}: column vector creator, eg \mvctt{a}{n} gets  $(a_1, a_2, \dots, a_n)^T$ , \mvctzt{a}{n} gets  $(a_0, a_1, \dots, a_n)^T$
- \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