CONTENTS

# Math-Symbols-in-LATEX-Manual

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Version: v1.2.5.3, Last Update: April 18, 2018

## Contents

т,	Constants and Oserui Symbols															
	Vector and Matrix Defination  2.1 Vector Notations															
3 Useful Functions and Operators																
4 Useful Aliases and Generators															•	
T OSCIAI THIABES AND GENERATORS															4	
1 Constants and Useful Symbols																
i j e	$\begin{array}{llllllllllllllllllllllllllllllllllll$															
<ul><li>Vector and Matrix Defination</li><li>Vector Notations</li></ul>																
							V 7 - I-			V 1			<b>V</b>			
$egin{array}{c} a \ b \end{array}$	\mva \mvb	•	\mvj \mvk	$egin{array}{c} s \ t \end{array}$	\mvs \mvt	$oldsymbol{lpha}{oldsymbol{eta}}$	\mvalph \mvbeta			\mvka		$oldsymbol{v}{oldsymbol{\phi}}$			ilon	
c	\mvc		\mvl	$oldsymbol{u}$	\mvu	$\gamma$	\mvgamm			\mvmu						
d	\mvd		\mvm	$oldsymbol{v}$	\mvv	$\stackrel{'}{\pmb{\delta}}$	\mvdelt		•	\mvnu						
e	\mve		\mvn	$oldsymbol{w}$	\mvw	$\epsilon$	\mvepsi			\mvxi	•					
f	\mvf	0	\mvo	$\boldsymbol{x}$	\mvx	$\boldsymbol{\zeta}$	\mvzeta		$\pi$	\mvpi	L					
$\boldsymbol{g}$	\mvg	$oldsymbol{p}$	\mvp	$oldsymbol{y}$	\mvy	$\eta$	\mveta		ho	\mvrh						
h	\mvh	-	\mvq	$\boldsymbol{z}$	\mvz	$oldsymbol{ heta}$	\mvthet		$\sigma$	` 0						
i	\mvi	r	\mvr			$\iota$	\mviota		au	\mvta	u					
2.2	Ma	trix	Notat	ions												
$\mathbf{A}$	\mma		\mmg				\mms				\mmg		Σ		\mmsigma	
В	\mmb		\mmh	N	\mmn	$\mathbf{T}$	\mmt	${f Z}$	\mmz			lelta	Υ		\mmupsilc	on
C	\mmc		\mmi	O	\mmo	U	\mmu			Θ		heta	Φ		\mmphi	
D	\mmc		\mmj	P	\mmp	V	\mmv			$\Lambda$		ambda			\mmpsi	
${f E}$	\mme		\mmk	Q	/mmq	$\mathbf{W}$	\mmw			Ξ	\mmx		Ω	Ľ	\mmomega	
r	\mmf	L	\mml	$\mathbf{R}$	\mmr	$\mathbf{X}$	\mmx			Π	\mmp	ıΤ				

#### 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{J}^T
                                                                                                               \mathbf{\Theta}^T
\mathbf{C}^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
                                                       \mathbf{T}^T
                                                                                                               \mathbf{\Pi}^T
                           \mathbf{M}^T
           \mmft
                                                                                                                           \mmpit
                                       \mmmt
                                                                   \mmtt
\mathbf{G}^T
                           \mathbf{N}^T
                                                                                                               \mathbf{\Sigma}^T
                                                       \mathbf{U}^T
           \mmgt
                                       \mmnt
                                                                   \mmut
                                                                                                                           \mmsigmat
```

#### 2.4 Tensor Notations

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

#### 2.5 Special vector and matrix notation

```
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
                                                                                      dist
                                                corr
                                                                argmax
\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  $\frac{\partial u}{\partial t}|_{x=5}$
- \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