# Math-Symbols-in-LATEX-Manual

# polossk

Last Update: November 27, 2017

# Contents

1	Constants and Useful Symbols										
2	2.1 2.2 2.3	Vector Matri Trans	x Notation posed Mat	s s rix Notat						1 1	
3	Useful Functions and Operators										
4 Useful Aliases and Generators											
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}	
е	\me	$\mathbb{Q}$	\mrato	Cond.	\mcond	$L^2(I)$	$\mbox{mslbg}{2}$				
		T₽	\mreal	const	\mconst	$H^2(I)$	\mcch1{2}				

# 2 Vector and Matrix Defination

## 2.1 Vector Notations

```
\boldsymbol{j}
                          \mvj
                                             \mvs
                                                                \mvalpha
                                                                                             \mvkappa
                                                                                                                          \mvupsilon
\boldsymbol{a}
      \mva
                                     s
                                                        \alpha
                                                                                                                  \boldsymbol{v}
\boldsymbol{b}
                  \boldsymbol{k}
                                                               \mvbeta
      \mvb
                          \mvk
                                     t
                                             \mvt
                                                        \beta
                                                                                       \lambda
                                                                                             \mvlambda
                                                                                                                   \phi
                                                                                                                          \mvphi
                  \boldsymbol{l}
\boldsymbol{c}
      \mvc
                          \mv1
                                             \mvu
                                                               \mvgamma
                                                                                             \mvmu
                                                                                                                          \mvchi
                                     \boldsymbol{u}
                                                        \gamma
                                                                                       \boldsymbol{\mu}
                                                                                                                  \chi
d
      \mvd
                          \mvm
                                             \mvv
                                                        \delta
                                                                \mvdelta
                                                                                             \mvnu
                                                                                                                          \mvpsi
                  m
                                     \boldsymbol{v}
                                                                                      ξ
                                                                                                                          \mvomega
      \mve
                                             \mvw
                                                               \mvepsilon
                                                                                             \mvxi
e
                  \boldsymbol{n}
                          \mvn
                                     \boldsymbol{w}
\boldsymbol{f}
      \mvf
                          \mvo
                                             \mvx
                                                        ζ
                                                                \mvzeta
                                                                                             \mvpi
                  \boldsymbol{o}
                                     \boldsymbol{x}
      \mvg
                          \mvp
                                             \mvy
                                                                \mveta
                                                                                             \mvrho
g
                  \boldsymbol{p}
                                     \boldsymbol{y}
                                                        \eta
h
      \mvh
                          \mvq
                                             \mvz
                                                        \theta
                                                                \mvtheta
                                                                                             \mvsigma
      \mvi
                          \mvr
                                                                \mviota
                                                                                             \mvtau
```

#### 2.2 Matrix Notations

```
\mmg
                                                               \mathbf{S}
\mathbf{A}
        \mma
                     \mathbf{G}
                                         \mathbf{M}
                                                   \mmm
                                                                         \mms
                                                                                      \mathbf{Y}
                                                                                               \mmy
                                                                                                                     Ξ
                                                                                                                              \mmxi
                                                                                                                                                               \mmomega
                                                               \mathbf{T}
\mathbf{B}
        \mmb
                     \mathbf{H}
                             \mbox{mmh}
                                          \mathbf{N}
                                                   \mmn
                                                                         \mmt
                                                                                      {f Z}
                                                                                               \mbox{\mbox{mmz}}
                                                                                                                     Π
                                                                                                                              \mmpi
\mathbf{C}
        \mmc
                     Ι
                             \mmi
                                          \mathbf{O}
                                                   \mmo
                                                               \mathbf{U}
                                                                         \mmu
                                                                                     \Gamma
                                                                                               \mmgamma
                                                                                                                     \mathbf{\Sigma}
                                                                                                                              \mmsigma
                                                               \mathbf{V}
                                                                                                                      Υ
\mathbf{D}
        \mmd
                     \mathbf{J}
                             \mmj
                                          \mathbf{P}
                                                   \mmp
                                                                         \mmv
                                                                                      \Delta
                                                                                               \mmdelta
                                                                                                                              \mmupsilon
\mathbf{E}
                     \mathbf{K}
                                          \mathbf{Q}
                                                               \mathbf{W}
                                                                                      Θ
                                                                                                                      Φ
                                                                                                                              \mmphi
        \mme
                             \mmk
                                                   \mmq
                                                                         \mmw
                                                                                               \mmtheta
                     \mathbf{L}
                                          \mathbf{R}
                                                               \mathbf{X}
                                                                                                                      \Psi
        \mmf
                             \mbox{mm1}
                                                   \mmr
                                                                         \mmx
                                                                                      Λ
                                                                                               \mmlambda
                                                                                                                              \mmpsi
```

### 2.3 Transposed Matrix Notations

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

#### 2.4 Special vector and matrix notation

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

# 3 Useful Functions and Operators

```
d
    \diff
                 diag
                        \diag
                                 lcm
                                           \1cm
                                                            \var
                                                                     card
                                                                                 \card
                                                                                             argopt
                                                                                                       \argopt
                                                    var
D
    \Diff
                 eig
                        \eig
                                           \rand
                                                            \corr
                                                                     argmin
                                                                                 \argmin
                                                                                             dist
                                                                                                       \dist
                                  rand
                                                    corr
\mathbf{E}
     \Expect
                        \tr
                                                                                 \argmax
                 \operatorname{tr}
                                  mean
                                           \mean
                                                    conv
                                                            \conv
                                                                     argmax
```

# 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  $\frac{\mathrm{d}^{2}u}{\mathrm{d}x^{2}}$
- \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  $\left\{\left[\left(a^2+b^2\right)^2\right]^2\right\}$
- \mfuncat{}{}: create a symbol |, eg \mfuncat{\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 case environment