The `natex` package

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Abstract

A collection of commands focused on consistent notation for mathematics, physics, and engineering. The repository for this package can be found at: https://github.com/amilkyboi/natex.

Contents

1 Included Packages

This package requires and includes the `amssymb`, `bm`, and `mathtools` packages.

2 Commands

2.1 Automated Bracing

Command	Usage	Output	Definition
\abs	\abs{x}	$\lvert x \rvert$	absolute value
\norm	\norm{x}	$\lVert x \rVert$	norm
\comm	\comm{x}{y}	$[x, y]_-$	commutator
\acomm	\acomm{x}{y}	$[x, y]_+$	anticommutator
\pb	\pb{x}{y}	$\{x, y\}$	Poisson bracket
\order	\order{x}	$\mathcal{O}(x)$	order of magnitude
\eval	\eval{x}	$x\rvert$	evaluation limits

2.2 Vector Notation

Command	Usage	Output	Definition
\vb	\vb{x}	$\boldsymbol{x}$	bold vector
\vu	\vu{x}	$\hat{\boldsymbol{x}}$	unit vector
\vdot	\vb{x} \vdot \vb{y}	$\boldsymbol{x} \cdot \boldsymbol{y}$	dot product
\vcrs	\vb{x} \vcrs \vb{y}	$\boldsymbol{x} \times \boldsymbol{y}$	cross product
\grad	\grad{x}	$\boldsymbol{\nabla} x$	gradient
\divr	\divr{\vb{x}}	$\boldsymbol{\nabla} \cdot \boldsymbol{x}$	divergence
\curl	\curl{\vb{x}}	$\boldsymbol{\nabla} \times \boldsymbol{x}$	curl
\slap	\slap{x}	$\nabla^2 x$	scalar Laplacian
\vlap	\vlap{\vb{x}}	$\boldsymbol{\nabla}^2 \boldsymbol{x}$	vector Laplacian
\dalem	\dalem	$\Box$	d'Alembertian
\del	\del	$\boldsymbol{\nabla}$	del

2.3 Dirac Notation

Command	Usage	Output	Definition
`\bra`	`\bra{x}`	$\bra{x}$	bra
`\ket`	`\ket{x}`	$\ket{x}$	ket
`\ev`	`\ev{x}`	$\ev{x}$	expectation value
`\ip`	`\ip{x}{y}`	$\ip{x}{y}$	inner product
`\op`	`\op{x}{y}`	$\op{x}{y}$	outer product
`\mel`	`\mel{x}{y}{z}`	$\mel{x}{y}{z}$	matrix element

2.4 Set Notation

Command	Usage	Output	Definition
`\N`	`\N`	$\N$	set of natural numbers
`\Z`	`\Z`	$\Z$	set of integers
`\Q`	`\Q`	$\Q$	set of rational numbers
`\R`	`\R`	$\R$	set of real numbers
`\C`	`\C`	$\C$	set of complex numbers
`\set`	`\set{a, b, c}`	$\set{a, b, c}$	set notation
`\set`	`\set{a \given b, c}`	$\set{a \given b, c}$	set builder notation

2.5 Matrix Notation

Command	Usage	Output	Definition
`\pmx`	`\pmx{1 & 2 \\ 3 & 4}`	$\begin{pmatrix} 1 & 2 \\ 3 & 4 \end{pmatrix}$	parenthetical matrix
`\bmx`	`\bmx{1 & 2 \\ 3 & 4}`	$\begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix}$	bracketed matrix
`\vmx`	`\vmx{1 & 2 \\ 3 & 4}`	$\begin{vmatrix} 1 & 2 \\ 3 & 4 \end{vmatrix}$	vertical matrix
`\cmx`	`\cmx{1 & 2 \\ 3 & 4}`	$\begin{Bmatrix} 1 & 2 \\ 3 & 4 \end{Bmatrix}$	curly matrix
`\tr`	`\tr \pmx{1 & 2 \\ 3 & 4}`	$\mathrm{tr} \begin{pmatrix} 1 & 2 \\ 3 & 4 \end{pmatrix}$	trace
`\adj`	`\adj \pmx{1 & 2 \\ 3 & 4}`	$\mathrm{adj} \begin{pmatrix} 1 & 2 \\ 3 & 4 \end{pmatrix}$	adjoint
`\tp`	`\tp{A}`	A^{T}	transpose
`\cc`	`\cc{A}`	A^{*}	complex conjugate
`\hc`	`\hc{A}`	$A^{\dagger}$	Hermitian conjugate

2.6 Linear Operators

Command	Usage	Output	Definition
`\sop`	`\sop{x}`	$\hat{x}$	scalar operator
`\vop`	`\vop{x}`	$\hat{\boldsymbol{x}}$	vector operator

2.7 Probability

Command	Usage	Output	Definition
`\erf`	`\erf`	erf	error function
`\erfc`	`\erfc`	erfc	complementary error function

2.8 Trigonometric Functions

Command	Usage	Output	Definition
`\asin`	`\asin{x}`	$\asin x$	arcsine
`\acos`	`\acos{x}`	$\acos x$	arccosine
`\atan`	`\atan{x}`	$\atan x$	arctangent
`\asec`	`\asec{x}`	$\asec x$	arcsecant
`\arcsec`	`\arcsec{x}`	$\arcsec x$	arcsecant
`\acsc`	`\acsc{x}`	$\acsc x$	arccosecant
`\arccsc`	`\arccsc{x}`	$\arccsc x$	arccosecant
`\acot`	`\acot{x}`	$\acot x$	arccotangent
`\arccot`	`\arccot{x}`	$\arccot x$	arccotangent
`\sech`	`\sech{x}`	$\sech x$	hyperbolic secant
`\csch`	`\csch{x}`	$\csch x$	hyperbolic cosecant

2.9 Other

Command	Usage	Output	Definition
`\Re`	`\Re`	$\Re$	real part
`\Im`	`\Im`	$\Im$	imaginary part
`\defas`	`\defas`	$\defas$	defined as
`\subtxt`	`x\subtxt{text}`	$x\subtxt{text}$	upright subscript
`\suptxt`	`x\suptxt{text}`	$x\suptxt{text}$	upright superscript