$Emacs\ TeQ:\ (T_{\hbox{\footnotesize\it E}}X\ +\ Quail)$

Input Method written in Quail for entering $\ensuremath{\text{\fontfont MTEX}}\xspace$ math expressions

Garid Zorigoo

April 10, 2023

Contents

1	\mathbf{Alp}	habet related stuff:	2
	1.1	Greek	2
	1.2	Matrix (aka bold)	4
	1.3	Vector & Hat	5
2	Fun	action Expansion	6
3	Syn	nbols:	6
	3.1	Dots related	6
	3.2	Geometry	6
	3.3	Letter like	7
	3.4	Spaces	7
	3.5	Arrows:	8
		3.5.1 Single:	8
		3.5.2 Double:	8
		3.5.3 Long arrow with top-bottom entries	9
4	Syn	nbol Modification	9
	4.1	Accents (variable decoration?)	9
5	Bin	ary Operation Symbols	10
	5.1	Simple Arithmetics:	10
	5.2	Binary Relations:	12
	5.3	Set symbols	13
	5.4	Logic	13

6	Fun	ctions	14				
	6.1	Function	14				
	6.2	Trignometry: function	14				
	6.3	Iterative-like operation:	15				
7	Stru	uctural:	16				
	7.1	Parenthesis Related	16				
	7.2	Texts:	16				
	7.3	Superscripts (power) & Subsripts (lower)	17				
	7.4	Misc	17				
	7.5	xy Diagram related	17				
8	Fori	matting Table into Elisp	18				
9	Mal	king the el	27				
10	0 Execuation el 37						

1 Alphabet related stuff:

1.1 Greek

Table 1: Main Greek letters

	Table 1: Main Greek letters					
key	sym	latex (lower greek)	key	sym	latex (upper greek)	
a.	α	\alpha	Α.	A	A	
b.	β	\beta	В.	B	В	
c.	ψ	\psi	C.	Ψ	\Psi	
d.	δ	\delta	D.	Δ	\Delta	
e.	ϵ	\epsilon	E.	E	E	
f.	ϕ	\phi	F.	Φ	\Phi	
g.	γ	\gamma	G.	Γ	\Gamma	
h.	η	\eta	Н.	H	Н	
i.	ι	\iota	I.	I	I	
j.	ξ	\xi	J.	Ξ	\Xi	
k.	κ	\kappa	K.	K	K	
1.	λ	\lambda	L.	Λ	\Lambda	
m.	μ	\mu	M.	M	M	
n.	ν	\nu	N.	N	N	
ο.	o	0	0.	O	0	
p.	π	\pi	Р.	Π	\Pi	
r.	ho	\rho	R.	P	P	
s.	σ	\sigma	S.	\sum	\Sigma	
t.	au	\tau	T.	T	T	
th.	θ	\theta	Th.	Θ	\Theta	
u.	v	\upsilon	U.	Υ	Υ	
W.	ω	\omega	W.	Ω	\Omega	
x.	χ	\chi	Х.	X	X	
z.	ζ	\zeta	Z.	Z	Z	

 $\begin{array}{c|cccc} \hline \text{Table 2: Variation Greek letters} \\ \hline \text{key} & \text{sym} & \text{latex (lower greek)} \\ \hline \text{e...} & \varepsilon & \text{varepsilon} \\ \hline \text{f...} & \varphi & \text{varphi} \\ \hline \text{s...} & \varsigma & \text{varsigma} \\ \hline \text{t...} & \vartheta & \text{vartheta} \\ \hline \end{array}$

\varrho

 ϱ

r..

Matrix (aka bold) 1.2

Table 3:	Matrix
\	_

		Table 3:	Matr	ix	
key	sym	latex (upper bold)	key	sym	latex (lower bold)
Am	${f A}$	\mathbf{A}	am	\mathbf{a}	\mathbf{a}
Bm	${f B}$	\mathbf{B}	bm	b	\mathbf{b}
Cm	${f C}$	\mathbf{C}	cm	\mathbf{c}	\mathbf{c}
Dm	\mathbf{D}	\mathbf{D}	dm	\mathbf{d}	\mathbf{d}
Em	${f E}$	\mathbf{E}	em	\mathbf{e}	\mathbf{e}
Fm	${f F}$	\mathbf{F}	fm	\mathbf{f}	\mathbf{f}
Gm	${f G}$	\mathbf{G}	gm	${f g}$	\mathbf{g}
Hm	\mathbf{H}	\mathbf{H}	hm	\mathbf{h}	\mathbf{h}
Im	\mathbf{I}	\mathbf{I}	im	i	\mathbf{i}
Jm	${f J}$	\mathbf{J}	jm	j	\mathbf{j}
Km	\mathbf{K}	\mathbf{K}	km	\mathbf{k}	\mathbf{k}
Lm	${f L}$	\mathbf{L}	lm	1	1
Mm	${f M}$	\mathbf{M}	mm	\mathbf{m}	\mathbf{m}
Nm	\mathbf{N}	\mathbf{N}	nm	\mathbf{n}	\mathbf{n}
Om	Ο	0	om	O	\mathbf{o}
Pm	\mathbf{P}	\mathbf{P}	pm	\mathbf{p}	\mathbf{p}
Qm	${f Q}$	\mathbf{Q}	qm	${f q}$	\mathbf{q}
Rm	${f R}$	\mathbf{R}	rm	${f r}$	\mathbf{r}
Sm	\mathbf{S}	$Mathbf\{S\}$	sm	\mathbf{s}	\mathbf{s}
Tm	${f T}$	\mathbf{T}	tm	\mathbf{t}	\mathbf{t}
Um	\mathbf{U}	D_{U}	um	\mathbf{u}	\mathbf{u}
Vm	${f V}$	$\mbox{mathbf{V}}$	vm	\mathbf{v}	\mathbf{v}
Wm	\mathbf{W}	\mathbf{W}	wm	\mathbf{w}	\mathbf{w}
Xm	\mathbf{X}	\mathbf{X}	xm	\mathbf{x}	\mathbf{x}
Ym	\mathbf{Y}	\mathbf{Y}	ym	\mathbf{y}	\mathbf{y}
Zm	${f Z}$	\mathbf{Z}	zm	${f z}$	\mathbf{z}
Om	0	0	Om	0	0

1.3 Vector & Hat

Table 4: Vectors and Hats					
key	sym	latex (vec)	key	sym	latex (hat)
av	\vec{a}	\vec{a}	ah	\hat{a}	\hat{a}
bv	$ec{b}$	\vec{b}	bh	\hat{b}	\hat{b}
cv	$ec{c}$	\vec{c}	ch	\hat{c}	$\hat\{c\}$
dv	\vec{d}	\vec{d}	dh	\hat{d}	\hat{d}
ev	$ec{e}$	\vec{e}	eh	\hat{e}	\hat{e}
fv	$ec{f}$	\vec{f}	fh	\hat{f}	\hat{f}
gv	$ec{g}$	\vec{g}	gh	\hat{g}	$\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ $
hv	$ec{ec{g}} {ec{h}}$	$\operatorname{\vec}\{h\}$	hh	\hat{h}	\hat{h}
iv	$ec{i}$	\vec{i}	ih	\hat{i}	\hat{i}
jv	$ec{j} \over ec{k}$	\vec{j}	jh	$\hat{j} \ \hat{k}$	\hat{j}
kv		\vec{k}	kh		\hat{k}
lv	$ec{l}$	$\sqrt{2}$	lh	\hat{l}	$\hat{1}$
mv	$ec{m}$	\vec{m}	mh	\hat{m}	$\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ $
nv	\vec{n}	$\operatorname{vec}\{n\}$	nh	\hat{n}	$\ \hat\{n\}$
ov	\vec{o}	\vec{o}	oh	\hat{o}	\hat{o}
pv	$ec{p}$	\vec{p}	ph	\hat{p}	$\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ $
qv	$ec{q}$	\vec{q}	qh	\hat{q}	$\ \ \ \ \ \ \ \ \ \ \ \ \ $
rv	$ec{r}$	\vec{r}	rh	\hat{r}	\hat{r}
sv	\vec{s}	\vec{s}	sh	\hat{s}	\hat{s}
tv	$ec{t}$	\vec{t}	th	\hat{t}	\hat{t}
uv	\vec{u}	\vec{u}	uh	\hat{u}	\hat{u}
vv	\vec{v}	\vec{v}	vh	\hat{v}	$\hat\{v\}$
WV	$ec{w}$	\vec{w}	wh	\hat{w}	\hat{w}
xv	\vec{x}	\vec{x}	xh	\hat{x}	\hat{x}
yv	$ec{y}$	\vec{y}	yh	\hat{y}	\hat{y}
zv	$ec{z}$	\vec{z}	zh	\hat{z}	\hat{z}

2 Function Expansion

Table 5: Keys that will execute some elisp functions

key	trans	sym	description
/	quail-TeQ-frac		fraction on previous
eq	quail-TeQ-equation		equation environment
al	quail-TeQ-aligned		aligned environment
el	quail-TeQ-endofline		end of line

3 Symbols:

3.1 Dots related

Table 6: Multiple Dots Related

key	trans	sym	description
	\dots		3 dots
.v	\vdots	:	vertical dots
.d	\ddots	٠	diagonale dots
.1	\ldots		low dots

3.2 Geometry

Table 7:

Table 1.					
key	trans	sym	description		
perp	\perp	Т			
perpn	\perp	1			
para	\parallel				
paran	\nparallel	#			
ang	\angle	_			
ang.	\measuredangle	4			

3.3 Letter like

Table 8: Letter-like Symbold

			· ·
key	trans	sym	description
inf	\infty	∞	
ex	\exists	\exists	
ex.	\nexists	∄	
fa	\forall	\forall	
hb	\hbar	\hbar	
hb.	\hslash	\hbar	
dd	\mathbf{d}	d	
dd.	$\operatorname{ar{partial}}$	∂	
ii	\imath	\imath	
jj	$\$ jmath	J	
nab	\nabla	∇	
cm	\checkmark	✓	

3.4 Spaces

Table 9: Space Symbold

	rabic o.	Space k	J III OIG
key	trans	sym	description
qu			
quu	\qquad		

3.5 Arrows:

3.5.1 Single:

Table 10: Single Line arrows

key	trans	sym	description
<-	\leftarrow	\leftarrow	left arrow
->	\rightarrow	\rightarrow	right arrow
-^	\uparrow	\uparrow	up arrow
-v	\downarrow	\downarrow	down arrow
<->	\leftrightarrow	\leftrightarrow	left-right arrow
<-n	\nleftarrow	←	not left arrow
->n	\nrightarrow	$\rightarrow \rightarrow$	not right arrow
-^n	\nuparrow	7	not up arrow
-vn	\ndownarrow	ŧ	not down arrow
<->	\nleftrightarrow	$\leftrightarrow \rightarrow$	not left-right arrow
>	\longrightarrow	\longrightarrow	
<	\longleftarrow	\leftarrow	
->	\mapsto	\mapsto	

3.5.2 Double:

Table 11: Double Line arrows

	Table 11. Double 1	<u> </u>	10110
key	trans	sym	description
<=	\Leftarrow	\Leftarrow	left arrow
=>	\Rightarrow	\Rightarrow	right arrow
=^	\Uparrow	\uparrow	up arrow
=v	\Downarrow	\Downarrow	down arrow
<=>	$ackslash ext{Leftrightarrow}$	\Leftrightarrow	left-right arrow
iff	\Leftrightarrow	\Leftrightarrow	left-right arrow
<=n	\nLeftarrow	#	left arrow
=>n	\n Rightarrow	\Rightarrow	right arrow
<=>n	$\n Leftrightarrow$	\Leftrightarrow	left-right arrow
iffn	$\n eftrightarrow$	#	left-right arrow
<==>	\Longleftrightarrow	\iff	left-right arrow
<==	\Longleftarrow	$ \leftarrow $	left-right arrow
==>	\Longrightarrow	\Longrightarrow	left-right arrow

3.5.3 Long arrow with top-bottom entries

Table 12: Long arrow Line arrows

	10010 12. 20116		
key	trans	sym	description
<	<pre>\xleftarrow[]{ }</pre>	-	
>	<pre>\xrightarrow[]{ }</pre>	$\xrightarrow{\square}$	
===>	<pre>\xRightarrow[]{ }</pre>	\Rightarrow	mathtools lib required
<===	<pre>\xLeftarrow[]{ }</pre>	-	mathtools lib required

4 Symbol Modification

4.1 Accents (variable decoration?)

	Table	13:	
key	trans	sym	description
vec	\vec	$\vec{\Box}$	
bar	\bar		
hat	\hat	$\hat{\Box}$	
dot	\dot	$\dot{\Box}$	
dot.	\ddot		
dot	\dddot		
dot	\ddddot		
dag	^\dagger	□†	
dag.	$^\delta$	□ ‡	
*	^*	_*	
deg	^\circ	□°	
tr	^T	\Box^T	
tr.	^{-T}	\Box^{-T}	

5 Binary Operation Symbols

5.1 Simple Arithmetics:

Table 14: Simple Arithmetics operations

key	trans	sym
+-	\pm	\pm
-+	\mp	干
*X	\times	×
::	\div	÷
**	\cdot	•

5.2 Binary Relations:

	Table 15:		
key	trans	sym	description
=n	\neq	\neq	
=.	\equiv	≡	
=?	\stackrel{?}{=}	?	
=у	\stackrel{\checkmark}{=}	$\stackrel{\checkmark}{=}$	
3=	\equiv	\equiv	
=:	\coloneqq	:=	
:=	\coloneqq	:=	
~.	\sim	\sim	
~n	\nsim	∞	
~~	\approx	\approx	
<n< td=""><td>\nless</td><td>*</td><td></td></n<>	\nless	*	
<.	\leq	\leq	
<.n	\nleq	≰	
</td <td>\stackrel{?}{<}</td> <td>?</td> <td></td>	\stackrel{?}{<}	?	
<y< td=""><td>\stackrel{\checkmark}{<}</td><td><</td><td></td></y<>	\stackrel{\checkmark}{<}	<	
<.?	\stackrel{?}{\leq}	? <u><</u>	
<.y	\stackrel{\checkmark}{\leq}	<u><</u>	
«	\11	«	
«?	$\stackrel{?}{\ll}$? ≪	
≪ y	$\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ $	«	
>n	\ngtr	\nearrow	
>.	\geq	\geq	
>.n	\ngeq	≱	
>?	\stackrel{?}{>}	?	
>y	\stackrel{\checkmark}{>}	★ < ★ ? < √ < ? < √ < ▼ < ★ > ★ ? < √ > < ↑ > ★ ? < √ > ? < ↑ >	
>.?	\stackrel{?}{\geq}	· >	
>.y	\stackrel{\checkmark}{\geq}	∨ ≥	
>	\gg	<i>≫</i>	
»?	$\stackrel{?}{\gg}$; >>>	
>>y	$\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ $	≫	

5.3 Set symbols

Table 16:

_	Table 1	10:	
key	trans	sym	description
in	\in	\in	
in.	\ni	\ni	
ni	\ni	\ni	
inn	\n	∉	
0/	\emptyset	Ø	
nsr	\mathbb{R}	\mathbb{R}	
nsc	\mathbb{C}	\mathbb{C}	
nsn	\mathbb{N}	\mathbb{N}	
nsp	\mathbb{P}	\mathbb{P}	
nsz	\mathbb{Z}	$\mathbb Z$	
nsi	\mathbb{I}	${\mathbb I}$	
sub	\subset	\subset	
subn	\nssubseteq	⊈	
sub=	\subseteq	\subseteq	
sub=n	\nsubseteq	⊈	
subn=	\nsubseteq	⊈	
sup	\supset	\supset	
supn	\nsupseteq	#=##>#=##	
sup=	\supeseteq	\supseteq	
sup=n	\nsupseteq	$ ot \geq$	
supn=	\nsupseteq	⊉	

5.4 Logic

Table 17:

	Table	11.	
key	trans	sym	description
or	\lor	V	
and	\lnd	\wedge	
not	\neg	\neg	
or.	<pre>\text{ or }</pre>	or	
and.	and	and	
not.	<pre>\text{ not }</pre>	not	

6 **Functions**

Function 6.1

key

rank

arg det dim exp Im

Re

ln

log max

 ${\tt min}$

10010 10.		
sym	description	
rank		
arg		
\det		
\dim		
\exp		
Im		
Re		
ln		
	rank arg det dim exp Im Re	

 \log

max

 \min

Table 18:

 \log

 \max

 \min

 \dim $\texttt{\dim}$ \dim $\sqrt[n]{\Box}$ \sqrt sqrt $\square \pmod{\square}$ \pmod ${\tt mod}$ $\square \mod \square$ mod . \mbox{mod} mod .. \bmod $\square \bmod \square$

Trignometry: function 6.2

Table 19:

key	sym	trans	key	sym	trans
cos	cos	\cos	cosh	cosh	\cosh
sin	\sin	\sin	sinh	\sinh	\sinh
tan	\tan	\tan	tanh	anh	\tanh
cot	\cot	\cot	coth	\coth	\c
acos	arccos	\arccos	cos.	arccos	\arccos
asin	arcsin	\arcsin	sin.	arcsin	\arcsin
atan	\arctan	\arctan	tan.	arctan	\arctan

6.3 Iterative-like operation:

Table 20: Integrals, Sums, Products

1	Table 20: Integrals, Sums, Product		1
key	trans	sym	description
il	\limits_{ }^{ }	\sum_{here}^{here}	
lim	\lim	lim	
sum	\sum	\sum	
prod	\prod	\prod	
int	\int	\int	
inti	\iint	\iint	
intii	\iiint	JJJ	
intiii	\iiiint	JJJJ	
into	\oint	∮	
sum.	$\sum_{i=1}^{n} i^{n}$	$\sum_{i=1}^{n} \prod_{i=1}^{n-\infty} \int_{-\infty}^{\infty} \int_{C} \int_{$	
prod.	$\prod\limits_{ i=1 }^{ n }$	$\prod_{i=1}^{n}$	
int.	$\int \int \int \int d^2x dx dx dx dx dx dx dx$	$\int_{-\infty}^{-\infty}$	
inti.	<pre>\iint\limits_{ C }</pre>	$\int \widetilde{\int} \widetilde{\int}$	
intii.	\iiint\limits_{ C }	ĬIJ	
intiii.	<pre>\iiiint\limits_{ C }</pre>	ĬIJſ	
into.	\oint\limits_{ C }	© C C C C C C C C C C C C C C C C C C C	

7 Structural:

7.1 Parenthesis Related

Table 21:

key	trans	sym	description
().	\left(\right)	(□)	
()	<pre>\left(\middle\vert \right)</pre>	$(\Box \Box)$	
[].	\left[\right]	$[\Box]$	
[]	<pre>\left[\middle\vert \right]</pre>	$[\Box \Box]$	
[].c	\lceil \rceil		
[].f	\lfloor \floor		
{}.	<pre>\left\{ \right\}</pre>	$\{\Box\}$	
{}	<pre>\left\{ \middle\vert \right\}</pre>	$\{\Box \Box\}$	
.	\left\vert \right\vert		

7.2 Texts:

Table 22:

		Table 22.	
key	trans	sym	description
te	$\text{text}{}$	a + text	
tr	\mathbf{mathrm}	a + mathrm	
tb	\mathbf{mathbf}	$a + \mathbf{mathbf}$	
ti		a + mathit	

7.3 Superscripts (power) & Subsripts (lower)

Table 23:

key	sym	trans	key	sym	trans
pp		^{	11		_{
p0	\Box^0	^ 0	10	\square_0	_0
p1	\Box^1	^1	11	\square_1	_1
p2	\Box^2	^2	12	\square_2	_2
р3	\square^3	^3	13	\square_3	_3
p4	\Box^4	^4	14	\square_4	_4
pn	\Box^n	^n	lnn	\square_n	_n
px	\Box^x	^x	li	\Box_i	_i
		{ }	^^		{ }
		<pre>_{ } }</pre>	^^ .		^{ }
			^^		<pre></pre>

7.4 Misc.

Table 24:

Table 24.									
key	trans	sym	description						
binom	\binom								
box	\boxed								
can	\cancel	Ø	requires cancel						
&=	&=\n\\\\								
=&	&=\n\\\\								

7.5 xy Diagram related

Table 25:

key	trans	sym	description
ху	$\xymatrix{\n\n}$		
bu	\bullet	•	
ar	\ar		

8 Formatting Table into Elisp

```
def format_table_to_elisp_type6col(headcomment, table):
    print(f";; {headcomment}")
    table = table[1:]
    for line in table:
        key, sym, trans, key1, sym, trans1 = line
            = repr(key).replace("\'", "\"").replace("~", "")
        key1 = repr(key1).replace("\'", "\"").replace("~", "")
        trans = repr(trans).replace("\'", "\"").replace("~", "")
        trans1 = repr(trans1).replace("\'", "\"").replace("~", "")
        print(f"({key:<7} [{trans:<17}]) ({key1:<7} [{trans1:<17}])")</pre>
def format_table_to_elisp_type3col_type1(headcomment, table):
    print(f";; {headcomment}")
    table = table[1:]
    for line in table:
        key, trans, sym, description = line
        key = repr(key).replace("\'", "\"").replace("~", "")
        trans = repr(trans).replace("\'", "\"").replace("~", "")
        print(f"({key: <8} [{trans: <22}]); {description}")</pre>
def format_table_to_elisp_type3col_type2(headcomment, table):
    print(f";; {headcomment}")
    table = table[1:]
    for line in table:
        key, trans, sym, description = line
        key = repr(key).replace("\'", "\"").replace("~", "")
        trans = trans.replace("~", "")
        print(f"({key:<8} {trans:<22}) ; {description}")</pre>
format_table_to_elisp_type6col("Greek", tbl_1_greek)
format_table_to_elisp_type6col("Matrix", tbl_1_matrix)
format_table_to_elisp_type6col("Vector & Hat", tbl_1_vec)
format_table_to_elisp_type3col_type2("Expanding Func", tbl2_exec_func)
```

```
format_table_to_elisp_type3col_type1("Symbols-dots", tbl_3_sym_dots)
format_table_to_elisp_type3col_type1("Symbols-geo", tbl_3_sym_geo)
format_table_to_elisp_type3col_type1("Symbols", tbl_3_sym_letter)
format_table_to_elisp_type3col_type1("Symbols spaces", tbl_3_sym_spc)
format_table_to_elisp_type3col_type1("Symbols arrow1", tbl_3_sym_arrow_1)
format_table_to_elisp_type3col_type1("Symbols arrow2", tbl_3_sym_arrow_2)
format_table_to_elisp_type3col_type1("Symbols arrow3", tbl_3_sym_arrow_3)
format_table_to_elisp_type3col_type1("Symbols arrow3", tbl_4_sym_mod_1)
format_table_to_elisp_type3col_type1("Operation: arith", tbl_5_op_arith)
format_table_to_elisp_type3col_type1("Operation: arith", tbl_5_op_bin)
format_table_to_elisp_type3col_type1("Operation: arith", tbl_5_op_set)
format_table_to_elisp_type3col_type1("Operation: arith", tbl_5_op_logic)
format_table_to_elisp_type3col_type1("Func: main", tbl_6_func)
format_table_to_elisp_type6col("Func: Trig", tbl_6_func_trig_6col)
format_table_to_elisp_type3col_type1("Func: iter", tbl_6_func_iter)
format_table_to_elisp_type3col_type1("Structural: Parenthesis", tbl_7_parenthesis)
format_table_to_elisp_type3col_type1("Structural: Text", tbl_7_text)
format_table_to_elisp_type3col_type1("Structural: Text", tbl_7_text)
format_table_to_elisp_type6col("Structural: Sub-sup-scripts", tbl_7_supsubscripts)
format_table_to_elisp_type3col_type1("Structural: misc", tbl_7_misc)
format_table_to_elisp_type3col_type1("Structural: xy", tbl_7_xy)
;; Greek
("a."
          ["\\alpha"
                            ]) ("A."
                                          ["A"
                                                            ])
("b."
          ["\\beta"
                            ]) ("B."
                                           ["B"
                                                            ])
("c."
          ["\\psi"
                            ]) ("C."
                                          ["\\Psi"
                                                            ])
                            ]) ("D."
("d."
          ["\\delta"
                                          ["\\Delta"
                                                            ])
("e."
          ["\\epsilon"
                            ]) ("E."
                                          ["E"
                                                            ])
("f."
          ["\\phi"
                            ]) ("F."
                                          ["\\Phi"
                                                            ])
          ["\\gamma"
                            ]) ("G."
                                          ["\\Gamma"
                                                            ])
("g."
("h."
          ["\\eta"
                            1) ("H."
                                          ["H"
                                                            1)
("i."
          ["\\iota"
                            ]) ("I."
                                          ["I"
                                                            1)
("j."
          ["\\xi"
                            ]) ("J."
                                          ["\\Xi"
                                                            1)
("k."
          ["\\kappa"
                            ]) ("K."
                                          ["K"
                                                            1)
("1."
          ["\\lambda"
                            ]) ("L."
                                          ["\\Lambda"
                                                            1)
("m."
          ["\\mu"
                            ]) ("M."
                                          ["M"
                                                            ])
```

```
("n."
                         ["\\nu"
                                                                               ("N."
                                                                                                        ["N"
                                                                                                                                                    ])
                                                                     ])
                                                                                                                                                    ])
("o."
                         ["o"
                                                                     ])
                                                                               ("0."
                                                                                                        ["0"
("p."
                         ["\\pi"
                                                                               ("P."
                                                                                                                                                    ])
                                                                     ])
                                                                                                        ["\\Pi"
                                                                                                        ["P"
("r."
                         ["\\rho"
                                                                     1)
                                                                               ("R."
                                                                                                                                                    ])
("s."
                         ["\\sigma"
                                                                     ])
                                                                               ("S."
                                                                                                        ["\\Sigma"
                                                                                                                                                    ])
("t."
                         ["\\tau"
                                                                     1)
                                                                               ("T."
                                                                                                        ["T"
                                                                                                                                                    ])
("th."
                                                                                                                                                    ])
                         ["\\theta"
                                                                     ])
                                                                               ("Th."
                                                                                                        ["\\Theta"
                                                                                                                                                    ])
("u."
                         ["\\upsilon"
                                                                     ])
                                                                               ("U."
                                                                                                        ["\\Upsilon"
                                                                                                                                                    ])
("w."
                         ["\\omega"
                                                                     ])
                                                                               ("W."
                                                                                                        ["\\Omega"
("x."
                         ["\\chi"
                                                                     ])
                                                                               ("X."
                                                                                                        ["X"
                                                                                                                                                    ])
                                                                                                        ["Z"
                                                                                                                                                    ])
("z."
                         ["\\zeta"
                                                                     ])
                                                                               ("Z."
;; Matrix
("Am"
                         ["\\mathbf{A}"
                                                                    ])
                                                                               ("am"
                                                                                                        ["\\mathbf{a}"
                                                                                                                                                    ])
("Bm"
                                                                    ])
                                                                               ("bm"
                                                                                                        ["\\mathbf{b}"
                                                                                                                                                    ])
                         ["\\mathbf{B}"
                                                                                                                                                    ])
("Cm"
                         ["\\mathbf{C}"
                                                                    ])
                                                                               ("cm"
                                                                                                        ["\\mathbf{c}"
                                                                                                                                                    ])
("Dm"
                         ["\\mathbf{D}"
                                                                    ])
                                                                               ("dm"
                                                                                                        ["\\mathbf{d}"
("Em"
                         ["\\mathbf{E}"
                                                                    1)
                                                                               ("em"
                                                                                                        ["\\mathbf{e}"
                                                                                                                                                    ])
("Fm"
                         ["\mbox{\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{}\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{
                                                                    1)
                                                                               ("fm"
                                                                                                        ["\mbox{\mbox{$m$}athbf{f}"}
                                                                                                                                                    ])
("Gm"
                         ["\\mathbf{G}"
                                                                    ])
                                                                               ("gm"
                                                                                                        ["\\mathbf{g}"
                                                                                                                                                    ])
("Hm"
                         ["\\mathbf{H}"
                                                                    ])
                                                                               ("hm"
                                                                                                        ["\\mathbf{h}"
                                                                                                                                                    ])
("Im"
                         ["\mathbf{I}]"
                                                                    ])
                                                                               ("im"
                                                                                                        ["\\mathbf{i}"
                                                                                                                                                    ])
                                                                                                        ["\\mathbf{j}"
                                                                                                                                                    ])
("Jm"
                         ["\\mathbf{J}"
                                                                    ])
                                                                               ("jm"
                                                                                                        ["\\mathbf{k}"
                                                                                                                                                    ])
("Km"
                         ["\\mathbf{K}"
                                                                    ])
                                                                               ("km"
("Lm"
                         ["\\mathbf{L}"
                                                                     1)
                                                                               ("lm"
                                                                                                        ["\mathbf{1}"
                                                                                                                                                    1)
("Mm"
                         ["\\mathbf{M}"
                                                                    1)
                                                                               ("mm"
                                                                                                        ["\\mathbf{m}"
                                                                                                                                                    ])
                         ["\\mathbf{N}"
                                                                                                        ["\mbox{\mbox{$m$} thbf{$n$}"}
("Nm"
                                                                     ])
                                                                               ("nm"
                                                                                                                                                    ])
("Om"
                         ["\\mathbf{0}"
                                                                    ])
                                                                               ("om"
                                                                                                        ["\\mathbf{o}"
                                                                                                                                                    ])
                                                                                                                                                    ])
("Pm"
                         ["\\mathbf{P}"
                                                                    ])
                                                                               ("pm"
                                                                                                        ["\\mathbf{p}"
                                                                    ])
                                                                               ("qm"
                                                                                                        ["\mbox{\mbox{$m$}athbf{q}$}"
                                                                                                                                                    ])
("Qm"
                         ["\\mathbf{Q}"
                         ["\mathbf{R}]"
                                                                    ])
                                                                               ("rm"
                                                                                                        ["\mathbf{r}"
                                                                                                                                                    ])
("Rm"
("Sm"
                         ["\\mathbf{S}"
                                                                     ])
                                                                               ("sm"
                                                                                                        ["\\mathbf{s}"
                                                                                                                                                    ])
("Tm"
                         ["\\mathbf{T}"
                                                                    ])
                                                                               ("tm"
                                                                                                        ["\\mathbf{t}"
                                                                                                                                                    ])
                                                                                                        ["\\mathbf{u}"
("Um"
                         ["\\mathbf{U}"
                                                                    ])
                                                                               ("um"
                                                                                                                                                    ])
("Vm"
                         ["\\mathbf{V}"
                                                                    1)
                                                                               ("vm"
                                                                                                        ["\\mathbf{v}"
                                                                                                                                                    ])
                                                                    ])
                                                                               ("wm"
                                                                                                                                                    ])
("Wm"
                         ["\\mathbf{W}"
                                                                                                        ["\\mathbf{w}"
("Xm"
                         ["\\mathbf{X}"
                                                                    ])
                                                                               ("xm"
                                                                                                        ["\mathbf{x}]"
                                                                                                                                                    ])
("Ym"
                         ["\\mathbf{Y}"
                                                                    ])
                                                                               ("ym"
                                                                                                        ["\\mathbf{y}"
                                                                                                                                                    ])
("Zm"
                         ["\\mathbf{Z}"
                                                                    ])
                                                                               ("zm"
                                                                                                        ["\mbox{\mbox{$m$}athbf{z}"}
                                                                                                                                                    ])
("Om"
                         ["\\mathbf{0}"
                                                                    1)
                                                                               ("Om"
                                                                                                        ["\\mathbf{0}"
                                                                                                                                                    ])
;; Vector & Hat
```

```
])
("bv"
           ["\\vec{b}"
                              1)
                                   ("bh"
                                              ["\\hat{b}"
("cv"
           ["\\vec{c}"
                                   ("ch"
                                                                  ])
                              1)
                                              ["\\hat{c}"
("dv"
           ["\\vec{d}"
                              1)
                                   ("dh"
                                              ["\\hat{d}"
                                                                  ])
("ev"
           ["\\vec{e}"
                              ])
                                   ("eh"
                                              ["\\hat{e}"
                                                                  ])
                                                                  1)
("fv"
           ["\\vec{f}"
                              1)
                                   ("fh"
                                              ["\\hat{f}"
                                                                  ])
("gv"
           ["\\vec{g}"
                              1)
                                   ("gh"
                                              ["\\hat{g}"
                                                                  ])
("hv"
           ["\\vec{h}"
                              ])
                                   ("hh"
                                              ["\\hat{h}"
                                                                  1)
("iv"
           ["\\vec{i}"
                              1)
                                   ("ih"
                                              ["\\hat{i}"
("jv"
           ["\\vec{j}"
                              1)
                                   ("jh"
                                              ["\\hat{j}"
                                                                  1)
                                                                  ])
("kv"
           ["\\vec{k}"
                              ])
                                   ("kh"
                                              ["\\hat{k}"
("lv"
           ["\\vec{1}"
                              ])
                                   ("lh"
                                              ["\\hat{1}"
                                                                  ])
("mv"
           ["\\vec{m}"
                              ])
                                   ("mh"
                                              ["\\hat{m}"
                                                                  ])
                                                                  ])
("nv"
           ["\vec{n}"
                              ])
                                   ("nh"
                                              ["\\ hat{n}"
                                                                  ])
("ov"
           ["\\vec{o}"
                              ])
                                   ("oh"
                                              ["\\hat{o}"
           ["\\vec{p}"
                                                                  ])
("pv"
                              ])
                                   ("ph"
                                              ["\\hat{p}"
                                                                  1)
("qv"
           ["\\vec{q}"
                              1)
                                   ("qh"
                                              ["\\hat{q}"
("rv"
           ["\\vec{r}"
                              1)
                                   ("rh"
                                              ["\\ hat{r}"
                                                                  ])
("sv"
           ["\\vec{s}"
                              1)
                                   ("sh"
                                              ["\\hat{s}"
                                                                  ])
("tv"
           ["\\vec{t}"
                              ])
                                   ("th"
                                              ["\\hat{t}"
                                                                  ])
                                                                  ])
("uv"
           ["\\vec{u}"
                              ])
                                   ("uh"
                                              ["\\hat{u}"
("vv")
                                                                  ])
           ["\\vec{v}"
                              1)
                                   ("vh"
                                              ["\\hat{v}"
"vw")
           ["\\vec{w}"
                              ])
                                   ("wh"
                                                                  ])
                                              ["\\hat{w}"
                              1)
                                   ("xh"
                                                                  1)
"vx")
           ["\vec{x}"]
                                              ["\\ hat{x}"
("yv"
           ["\\vec{y}"
                              1)
                                   ("yh"
                                              ["\\hat{y}"
                                                                  ])
("zv")
           ["\\vec{z}"
                              ])
                                   ("zh"
                                              ["\\ hat{z}"
                                                                  ])
;; Expanding Func
("/"
                                    )
            quail-TeQ-frac
                                       ; fraction on previous
("eq"
            quail-TeQ-equation
                                       ; equation environment
                                        ; aligned environment
("al"
            quail-TeQ-aligned
                                    )
("el"
            quail-TeQ-endofline
                                        ; end of line
;; Symbols-dots
("..."
            ["\\dots"
                                     ])
                                          ; 3 dots
(".v"
            ["\\vdots"
                                     ])
                                          ; vertical dots
(".d"
                                     ])
            ["\\ddots"
                                          ; diagonale dots
(".1"
            ["\\ldots"
                                     ])
                                          ; low dots
;; Symbols-geo
            ["\\perp"
                                     ])
("perp"
("perpn"
            ["\\perp"
                                     ])
                                          ;
("para"
            ["\\parallel"
                                     ])
                                          ;
```

("ah"

])

["\\hat{a}"

])

("av"

["\\vec{a}"

```
("paran"
           ["\\nparallel"
                                    ])
                                    ])
("ang"
           ["\\angle"
                                    ])
("ang."
           ["\\measuredangle"
;; Symbols
("inf"
           ["\\infty"
                                    ])
("ex"
                                    1)
           ["\\exists"
("ex."
           ["\\nexists"
                                    1)
                                    ])
("fa"
           ["\\forall"
                                    1)
("hb"
           ["\\hbar"
("hb."
           ["\\hslash"
                                    1)
("dd"
                                    ])
           ["\\mathrm{d}"
("dd."
           ["\\partial"
                                    ])
("ii"
           ["\\imath"
                                    ])
                                    ])
("jj"
           ["\\jmath"
                                    ])
("nab"
           ["\\nabla"
("cm"
           ["\\checkmark"
                                    ])
;; Symbols spaces
("qu"
           ["\\quad"
                                    ])
("quu"
           ["\\qquad"
                                    ])
;; Symbols arrow1
("<-"
           ["\\leftarrow"
                                    ])
                                         ; left arrow
("->"
           ["\\rightarrow"
                                    ])
                                         ; right arrow
("-^"
            ["\\uparrow"
                                    ])
                                         ; up arrow
           ["\\downarrow"
("-v"
                                    1)
                                         ; down arrow
("<->"
           ["\\leftrightarrow"
                                    ])
                                        ; left-right arrow
("<-n"
            ["\\nleftarrow"
                                    ])
                                         ; not left arrow
("->n"
            ["\\nrightarrow"
                                    ])
                                         ; not right arrow
("-^n"
                                    ])
            ["\\nuparrow"
                                         ; not up arrow
("-vn"
                                    ])
           ["\\ndownarrow"
                                        ; not down arrow
("<->"
                                    ])
           ["\\nleftrightarrow"
                                        ; not left-right arrow
("-->"
           ["\\longrightarrow"
                                    ])
("<--"
                                    ])
            ["\\longleftarrow"
("\\vert ->" ["\\mapsto"
                                       ])
;; Symbols arrow2
("<="
           ["\\Leftarrow"
                                    ])
                                         ; left arrow
("=>"
           ["\\Rightarrow"
                                    ])
                                        ; right arrow
("=^"
                                    ])
           ["\\Uparrow"
                                         ; up arrow
                                    ])
("=v"
           ["\\Downarrow"
                                        ; down arrow
("<=>"
           ["\\Leftrightarrow"
                                        ; left-right arrow
("iff"
           ["\\Leftrightarrow"
                                    ])
                                        ; left-right arrow
```

```
("<=n"
           ["\\nLeftarrow"
                                   ])
                                        ; left arrow
("=>n"
           ["\\nRightarrow"
                                   ])
                                        ; right arrow
("<=>n"
                                   ])
           ["\\nLeftrightarrow"
                                        ; left-right arrow
("iffn"
           ["\\nLeftrightarrow"
                                   1)
                                        ; left-right arrow
("<==>"
           ["\\Longleftrightarrow"])
                                        ; left-right arrow
("<=="
                                        ; left-right arrow
           ["\\Longleftarrow"
                                   ])
("==>"
           ["\\Longrightarrow"
                                   ])
                                        ; left-right arrow
;; Symbols arrow3
("<---"
           ["\\xleftarrow[]{}"
("--->"
           ["\\xrightarrow[]{}"])
("===>"
           ["\\xRightarrow[]{}"])
                                          ~mathtools~ lib required
("<==="
           ["\\xLeftarrow[]{}"
                                   ])
                                          ~mathtools~ lib required
;; Symbols arrow3
           ["\\vec"
("vec"
                                   ])
("bar"
           ["\\bar"
                                   ])
           ["\\hat"
                                   ])
("hat"
                                   1)
("dot"
           ["\\dot"
("dot."
           ["\\ddot"
                                   ])
("dot.."
           ["\\dddot"
                                   ])
           ["\\ddddot"
("dot..."
                                   ])
                                   ])
("dag"
           ["^\\dagger"
                                   ])
("dag."
           ["^\\ddagger"
("*.."
           ["^*"
                                   ])
           ["^\\circ"
                                   1)
("deg"
("tr"
           ["^T"
                                   ])
("tr."
           ["^{-T}"
                                   ])
;; Operation: arith
("+-"
           ["\\pm"
                                   ])
("-+")
           ["\\mp"
                                   ])
("*x"
                                   ])
           ["\\times"
("::"
           ["\\div"
                                   ])
("**"
                                   ])
           ["\\cdot"
;; Operation: arith
("=n"
           ["\\neq"
                                   ])
("=."
           ["\\equiv"
                                   ])
("=?"
           ["\\stackrel{?}{=}"
                                   ])
           ["\\stackrel{\\checkmark}{=}"])
("=y"
("3="
           ["\\equiv"
                                   ])
("=:"
           ["\\coloneqq"
                                   ])
(":="
           ["\\coloneqq"
                                   ])
```

```
("=.="
           ["\\sim"
                                    ])
("=n="
                                    ])
            ["\\nsim"
(""
           ["\\approx"
                                    ])
("<n"
           ["\\nless"
                                    ])
("<."
           ["\\leq"
                                    ])
("<.n"
                                    1)
           ["\\nleq"
("<?"
           ["\\stackrel{?}{<}"
                                    1)
("<y"
           ["\\stackrel{\\checkmark}{<}"])
("<.?"
            ["\\stackrel{?}{\\leq}"])
("<.y"
           ["\\stackrel{\\checkmark}{\\leq}"])
("<<"
           ["\\11"
                                    ])
("<<?"
           ["\\stackrel{?}{\\ll}" ])
("<<y"
           ["\\stackrel{\\checkmark}{\\ll}"]);
(">n"
           ["\\ngtr"
                                    ])
(">."
           ["\\geq"
                                    ])
(">.n"
            ["\\ngeq"
                                    ])
(">?"
           ["\\stackrel{?}{>}"
                                    1)
(">y"
           ["\\stackrel{\\checkmark}{>}"])
(">.?"
           ["\\stackrel{?}{\\geq}"])
           ["\\stackrel{\\checkmark}{\\geq}"])
(">.y"
(">>"
           ["\\gg"
                                    ])
           ["\\stackrel{?}{\\gg}" ])
(">>?"
(">>y"
           ["\\stackrel{\\checkmark}{\\gg}"]) ;
;; Operation: arith
("in"
           ["\\in"
                                    ])
           ["\\ni"
("in."
                                    ])
("ni"
           ["\\ni"
                                    ])
("inn"
           ["\\notin"
                                    ])
("0/"
           ["\\emptyset"
                                    ])
                                    ])
("nsr"
           ["\\mathbb{R}"
("nsc"
           ["\\mathbb{C}"
                                    ])
                                    ])
("nsn"
           ["\\mathbb{N}"
("nsp"
           ["\\mathbb{P}"
                                    ])
                                    ])
("nsz"
           ["\\mathbb{Z}"
("nsi"
           ["\mbox{\mbox{$"}}]
                                    ])
("sub"
           ["\\subset"
                                    ])
           ["\\nssubseteq"
("subn"
                                    ])
                                    ])
("sub="
           ["\\subseteq"
("sub=n"
           ["\\nsubseteq"
                                    ])
                                    ])
("subn="
           ["\\nsubseteq"
```

```
("sup"
            ["\\supset"
                                     ])
                                     ])
("supn"
            ["\\nsupseteq"
            ["\\supeseteq"
                                     ])
("sup="
("sup=n"
            ["\\nsupseteq"
                                     ])
("supn="
            ["\\nsupseteq"
                                     ])
;; Operation: arith
("or"
            ["\\lor"
                                     ])
("and"
            ["\\lnd"
                                     ])
("not"
                                     1)
            ["\\neg"
("or."
            ["\\text{ or }"
                                     ])
("and."
            ["\text{text{ and }}"
                                     ])
("not."
            ["\\text{ not }"
                                     ])
;; Func: main
("rank"
            ["\\mathrm{rank}"
                                     ])
            ["\\arg"
                                     ])
("arg"
            ["\\det"
                                     ])
("det"
                                     ])
            ["\\dim"
("dim"
("exp"
            ["\\exp"
                                     ])
("Im"
            ["\\mathrm{Im}"
                                     ])
("Re"
            ["\\mathrm{Re}"
                                     ])
("ln"
            ["\\ln"
                                     ])
("log"
            ["\\log"
                                     ])
("max"
            ["\\max"
                                     ])
                                     1)
("min"
            ["\\min"
                                     ])
("dim"
            ["\\dim"
("sqrt"
            ["\\sqrt"
                                     ])
                                     ])
("mod"
            ["\\pmod"
("mod."
            ["\\mod"
                                     ])
("mod.."
            ["\\bmod"
                                     ])
;; Func: Triq
("cos"
           ["\\cos"
                              ])
                                  ("cosh"
                                              ["\\cosh"
                                                                 ])
           ["\\sin"
                                  ("sinh"
                                              ["\\sinh"
                                                                 ])
("sin"
                              ])
("tan"
           ["\\tan"
                              ])
                                   ("tanh"
                                              ["\\tanh"
                                                                 ])
("cot"
           ["\\cot"
                                   ("coth"
                                                                 ])
                              1)
                                              ["\\coth"
("acos"
           ["\\arccos"
                              1)
                                   ("cos."
                                              ["\\arccos"
                                                                 ])
("asin"
           ["\\arcsin"
                              ])
                                  ("sin."
                                              ["\\arcsin"
                                                                 ])
("atan"
          ["\\arctan"
                                  ("tan."
                                              ["\\arctan"
                                                                 ])
                              ])
;; Func: iter
("il"
            ["\\limits_{ }^{ }"
                                     ])
("lim"
            ["\\lim"
                                     ])
```

```
("sum"
           ["\\sum"
                                  ])
                                  ])
("prod"
           ["\\prod"
("int"
           ["\\int"
                                  ])
("inti"
           ["\\iint"
                                  ])
("intii"
           ["\\iiint"
                                  ])
                                  1)
("intiii"
           ["\\iiiint"
           ["\\oint"
                                  ])
("into"
           ["\\sum\\limits_{ i=1 }^{ n }"]) ;
("sum."
           ["\\prod\\limits_{ i=1 }^{ n }"]) ;
("prod."
("int."
           ["\left( -\right) ^{ -\left( -\right) } ;
           ["\\iint\\limits_{ C }"])
("inti."
("intii."
           ["\\iiint\\limits_{ C }"])
("intiii." ["\\iiint\\limits_{ C }"]) ;
("into."
           ["\\oint\\limits_{ C }"])
;; Structural: Parenthesis
("()."
           ["\\left( \\right)"
                                  ])
("().."
           ["\\left( \\middle\\vert \\right)"]) ;
("[]."
           ["\\left[ \\right]"
                                  ])
("[].."
           ["\\left[ \\middle\\vert \\right]"]) ;
("[].c"
           ["\\lceil \\rceil"
                                  ])
           ["\\lfloor \\floor"
                                  ])
("[].f"
("{}."
           ["\\left\\{ \\right\\}"])
("{}.."
           ["\\left\\{ \\middle\\vert \\right\\}"]) ;
("\\vert\\vert ." ["\\left\\vert \\right\\vert"]) ;
;; Structural: Text
("te"
           ["\\text{}"
                                  ])
("tr"
           ["\\mathrm{}"
                                  ])
("tb"
                                  ])
           ["\\mathbf{}"
("ti"
           ["\\mathit{}"
                                  ])
;; Structural: Text
("te"
           ["\\text{}"
                                  ])
                                  ])
("tr"
           ["\\mathrm{}"
("tb"
           ["\\mathbf{}"
                                  ])
("ti"
           ["\\mathit{}"
                                  ])
;; Structural: Sub-sup-scripts
("pp"
          ["^{"
                            ])
                                ("11"
                                           ["_{"
                                                             ])
          ["^0"
                                                             ])
"0q")
                            ])
                                ("10"
                                           ["_0"
          ["~1"
                                                             ])
("p1"
                            ])
                                 ("11"
                                           ["_1"
          ["^2"
                                           ["_2"
("p2"
                            1)
                                 ("12"
                                                             ])
          ["^3"
("p3"
                            ])
                                ("13"
                                           ["_3"
                                                             ])
```

```
("p4"
          ["~4"
                            ]) ("14"
                                          ["_4"
                                                            ])
          ["^n"
                                                            ])
("pn"
                           ]) ("lnn"
                                          ["_n"
("px"
          [ " ^x ]
                            ]) ("li"
                                          ["_i"
                                                            1)
("__"
          ["\\underset{ }{ }"]) ("^~"
                                           ["\\overset{ }{ }"])
("__."
          ["\\underbrace{ }_{ }"]) ("^^."
                                              ["\\overbrace{ }^{ }"])
          ["\\underline{ }" ]) ("^^.."
("__.."
                                          ["\\overline{ }" ])
;; Structural: misc
          ["\\binom"
("binom"
                                  ])
("box"
           ["\\boxed"
                                  ])
("can"
           ["\\cancel"
                                  ]) ; requires ~cancel~
("&="
           ["&=\\n\\\\\"
                                  ])
           ["&=\\n\\\\\"
("=&"
                                  ])
;; Structural: xy
("xy"
           ["\\xymatrix{\\n\\n}"
                                  ]) ;
("bu"
           ["\\bullet"
                                  ])
("ar"
           ["\\ar"
                                  ]) ;
```

9 Making the el

```
(defun quail-TeQ-aligned (key idx)
  (quail-func-init)
 (insert "\\begin{aligned}\n\n\\end{aligned}")
 (previous-line)
 (quail-func-end))
(defun quail-TeQ-endofline (key idx)
 (quail-func-init)
 (end-of-line)
 (insert "\\\\n")
 (quail-func-end))
(defun quail-TeQ-frac (key idx)
  (quail-func-init)
  (backward-sexp) (kill-sexp)
 (if (looking-back "[a-zA-Z]" 0)
     (progn
       (backward-word)
       (if (= (preceding-char) ?\\ )
           (progn (message "yes") (kill-word 1)
                  (backward-delete-char 1) (insert "\\frac{\\")
                  (yank 1) (yank 2) (insert "}{}"))
         (progn (message "no") (forward-word)
                (insert "\\frac{") (yank) (insert "}{}")))
       )
   (progn (message "no")
                                      ; (forward-word)
          (insert "\\frac{") (yank) (insert "}{}"))
   )
  (backward-char)
 (quail-func-end))
(quail-define-package
"TeQ-Math" "Emacs-Teq-Latex" "TeQ-" t
"TeQ-Math input"
nil t t t t nil nil nil nil nil t)
```

```
(quail-define-rules
    ;; Greek Alphabets
    ;; Greek
                                       ("A."
                                                   ["A"
                                                                      ])
    ("a."
               ["\\alpha"
                                   ])
                                                                      ])
    ("b."
               ["\\beta"
                                   ])
                                       ("B."
                                                   ["B"
    ("c."
                                       ("C."
                                                                      ])
               ["\\psi"
                                   1)
                                                   ["\\Psi"
    ("d."
               ["\\delta"
                                   ])
                                       ("D."
                                                   ["\\Delta"
                                                                      ])
    ("e."
                                       ("E."
                                                   ["E"
                                                                      ])
               ["\\epsilon"
                                   ])
    ("f."
               ["\\phi"
                                   ])
                                       ("F."
                                                   ["\\Phi"
                                                                      ])
                                                   ["\\\\]
    ("g."
               ["\\gamma"
                                   ])
                                       ("G."
                                                                      ])
                                                                      ])
    ("h."
               ["\\eta"
                                   ])
                                       ("H."
                                                   ["H"
    ("i."
               ["\\iota"
                                   ])
                                       ("I."
                                                   ["I"
                                                                      ])
    ("j."
               ["\\xi"
                                   ])
                                       ("J."
                                                   ["\\Xi"
                                                                      ])
                                                   ["K"
                                                                      ])
    ("k."
               ["\\kappa"
                                   ])
                                       ("K."
    ("1."
               ["\\lambda"
                                   ])
                                       ("L."
                                                   ["\\Lambda"
                                                                      ])
                                                                      ])
    ("m."
               ["\\mu"
                                   ])
                                       ("M."
                                                   ["M"
    ("n."
               ["\\nu"
                                   ])
                                       ("N."
                                                   ["N"
                                                                      ])
    ("o."
               ["o"
                                                   ["0"
                                                                      ])
                                   ])
                                       ("0."
    ("p."
                                                                      ])
               ["\\pi"
                                   ])
                                       ("P."
                                                   ["\\Pi"
    ("r."
               ["\\rho"
                                   ])
                                       ("R."
                                                   ["P"
                                                                      ])
                                   1)
                                       ("S."
                                                                      ])
    ("s."
               ["\\sigma"
                                                   ["\\Sigma"
                                                   ["T"
    ("t."
               ["\\tau"
                                   ])
                                       ("T."
                                                                      ])
    ("th."
               ["\\theta"
                                   ])
                                       ("Th."
                                                   ["\Theta"
                                                                      ])
    ("u."
               ["\\upsilon"
                                   ])
                                       ("U."
                                                   ["\\Upsilon"
                                                                      ])
    ("w."
                                   ])
                                       ("W."
                                                                      ])
               ["\\omega"
                                                   ["\\Omega"
    ("x."
               ["\\chi"
                                   ])
                                       ("X."
                                                   ["X"
                                                                      ])
               ["\\zeta"
                                                                      ])
                                   ])
                                       ("Z."
                                                   ["Z"
    ("z."
    ;; Matrix
               ["\\mathbf{A}"
                                   ])
                                                   ["\\mathbf{a}"
                                                                      ])
    ("Am"
                                       ("am"
    ("Bm"
               ["\\mathbf{B}"
                                   ])
                                       ("bm"
                                                   ["\\mathbf{b}"
                                                                      ])
    ("Cm"
               ["\\mathbf{C}"
                                   ])
                                       ("cm"
                                                   ["\\mathbf{c}"
                                                                      ])
    ("Dm"
               ["\\mathbf{D}"
                                   ])
                                       ("dm"
                                                   ["\\mathbf{d}"
                                                                      ])
    ("Em"
               ["\\mathbf{E}"
                                   ])
                                       ("em"
                                                   ["\\mathbf{e}"
                                                                      ])
                                                                      ])
    ("Fm"
               ["\mathbf{F}]"
                                   ])
                                       ("fm"
                                                   ["\mathbf{f}"]
                                                                      ])
    ("Gm"
               ["\\mathbf{G}"
                                   ])
                                       ("gm"
                                                   ["\mathbf{g}]"
    ("Hm"
               ["\\mathbf{H}"
                                   ])
                                       ("hm"
                                                   ["\\mathbf{h}"
                                                                      ])
    ("Im"
               ["\mathbf{I}]"
                                   ])
                                       ("im"
                                                   ["\\mathbf{i}"
                                                                      ])
```

```
["\mathbf{J}"
                                               ["\mbox{mathbf{j}}"
                                                                   ])
("Jm"
                               ])
                                    ("jm"
                                                                   ])
("Km"
           ["\\mathbf{K}"
                               ])
                                    ("km"
                                               ["\\mathbf{k}"
                                                                   ])
("Lm"
           ["\\mathbf{L}"
                               ])
                                    ("lm"
                                               ["\mbox{\mbox{$m$}athbf{1}}"
                                                                   ])
("Mm"
           ["\\mathbf{M}"
                               ])
                                    ("mm"
                                               ["\\mathbf{m}"
("Nm"
           ["\\mathbf{N}"
                               ])
                                    ("nm"
                                               ["\mathbf{n}"
                                                                   ])
                                                                   ])
("Om"
           ["\\mathbf{0}"
                               ])
                                    ("om"
                                               ["\\mathbf{o}"
                                                                   ])
("Pm"
           ["\\mathbf{P}"
                               ])
                                    ("pm"
                                               ["\\mathbf{p}"
                                                                   ])
("Qm"
           ["\\mathbf{Q}"
                               ])
                                    ("qm"
                                               ["\mathbf{q}"
                                                                   ])
("Rm"
           ["\mathbf{R}]"
                               ])
                                    ("rm"
                                               ["\mathbf{r}"
("Sm"
           ["\\mathbf{S}"
                               ])
                                    ("sm"
                                               ["\\mathbf{s}"
                                                                   ])
("Tm"
                                                                   ])
           ["\\mathbf{T}"
                               ])
                                    ("tm"
                                               ["\\mathbf{t}"
("Um"
           ["\\mathbf{U}"
                               ])
                                    ("um"
                                               ["\\mathbf{u}"
                                                                   ])
("Vm"
           ["\\mathbf{V}"
                               ])
                                    ("vm"
                                               ["\\mathbf{v}"
                                                                   ])
("Wm"
                                                                   ])
           ["\\mathbf{W}"
                               ])
                                               ["\\mathbf{w}"
                                    ("wm"
                                                                   ])
("Xm"
           ["\\mathbf{X}"
                               ])
                                               ["\mathbf{x}]"
                                    ("xm"
                               ])
                                                                   ])
("Ym"
           ["\\mathbf{Y}"
                                    ("ym"
                                               ["\\mathbf{y}"
                                                                   ])
("Zm"
           ["\\mathbf{Z}"
                               ])
                                    ("zm"
                                               ["\mathbf{z}"
("Om"
           ["\\mathbf{0}"
                               ])
                                    ("Om"
                                               ["\\mathbf{0}"
                                                                   ])
;; Vector & Hat
("av"
                                    ("ah"
           ["\\vec{a}"
                               ])
                                               ["\\hat{a}"
                                                                   ])
                                                                   ])
("bv"
           ["\\vec{b}"
                               ])
                                    ("bh"
                                               ["\\hat{b}"
                               ])
                                                                   ])
("cv"
           ["\\vec{c}"
                                    ("ch"
                                               ["\\hat{c}"
("dv"
           ["\\vec{d}"
                               ])
                                    ("dh"
                                               ["\\hat{d}"
                                                                   ])
                               1)
                                                                   ])
("ev"
           ["\\vec{e}"
                                    ("eh"
                                               ["\\hat{e}"
                                                                   ])
("fv"
           ["\\vec{f}"
                               ])
                                    ("fh"
                                               ["\\hat{f}"
("gv"
           ["\\vec{g}"
                               ])
                                    ("gh"
                                               ["\\hat{g}"
                                                                   ])
("hv"
           ["\\vec{h}"
                               ])
                                    ("hh"
                                               ["\\hat{h}"
                                                                   ])
           ["\\vec{i}"
                               ])
                                    ("ih"
                                                                   ])
("iv"
                                               ["\\hat{i}"
("jv"
           ["\\vec{j}"
                               ])
                                    ("jh"
                                               ["\\hat{j}"
                                                                   ])
                               ])
                                                                   ])
("kv"
           ["\\vec{k}"
                                    ("kh"
                                               ["\\hat{k}"
("lv"
           ["\\vec{1}"
                               ])
                                    ("lh"
                                               ["\\hat{1}"
                                                                   ])
                                                                   ])
("mv"
           ["\\vec{m}"
                               ])
                                    ("mh"
                                               ["\\hat{m}"
                                               ["\\ hat{n}"
("nv"
           ["\vec{n}"
                               ])
                                    ("nh"
                                                                   ])
("ov"
           ["\\vec{o}"
                               ])
                                    ("oh"
                                               ["\\hat{o}"
                                                                   ])
           ["\\vec{p}"
                               ])
                                    ("ph"
                                                                   ])
("pv"
                                               ["\\hat{p}"
("qv"
           ["\\vec{q}"
                               ])
                                    ("qh"
                                                                   ])
                                               ["\\hat{q}"
("rv"
                                                                   ])
           ["\\vec{r}"
                               ])
                                    ("rh"
                                               ["\\ hat{r}"
                                                                   ])
           ["\\vec{s}"
                               ])
                                    ("sh"
("sv"
                                               ["\\hat{s}"
("tv"
           ["\\vec{t}"
                               ])
                                    ("th"
                                               ["\\hat{t}"
                                                                   ])
("uv"
           ["\\vec{u}"
                               ])
                                    ("uh"
                                               ["\\hat{u}"
                                                                   ])
```

```
("vv"
          ["\\vec{v}"
                              ])
                                  ("vh"
                                             ["\\hat{v}"
                                                                ])
           ["\\vec{w}"
                                                                ])
("wv"
                              1)
                                  ("wh"
                                             ["\\hat{w}"
("xv")
           ["\\vec{x}"
                              1)
                                  ("xh"
                                             ["\\hat{x}"
                                                                ])
("yy")
                                                                ])
           ["\\vec{y}"
                             1)
                                  ("yh"
                                             ["\\hat{y}"
("zv"
          ["\\vec{z}"
                             ])
                                  ("zh"
                                             ["\\ hat{z}"
                                                                ])
;; Expanding Func
("/"
           quail-TeQ-frac
                                      ; fraction on previous
                                      ; equation environment
("eq"
           quail-TeQ-equation
                                   )
("al"
           quail-TeQ-aligned
                                   )
                                      ; aligned environment
("el"
           quail-TeQ-endofline
                                      ; end of line
;; Symbols-dots
            ["\\dots"
("..."
                                    ])
                                        ; 3 dots
            ["\\vdots"
(".v"
                                    ])
                                        ; vertical dots
(".d"
            ["\\ddots"
                                    ])
                                        ; diagonale dots
(".1"
                                    ])
           ["\\ldots"
                                        ; low dots
;; Symbols-geo
                                    ])
("perp"
           ["\\perp"
("perpn"
           ["\\perp"
                                    ])
("para"
           ["\\parallel"
                                    ])
("paran"
            ["\\nparallel"
                                    ])
                                    ])
("ang"
           ["\\angle"
("ang."
           ["\\measuredangle"
                                    ])
;; Symbols
("inf"
            ["\\infty"
                                    ])
("ex"
           ["\\exists"
                                    ])
("ex."
            ["\\nexists"
                                    ])
("fa"
            ["\\forall"
                                    ])
("hb"
            ["\\hbar"
                                    ])
("hb."
           ["\\hslash"
                                    ])
                                    ])
("dd"
            ["\\mathrm{d}"
("dd."
            ["\\partial"
                                    ])
("ii"
                                    ])
            ["\\imath"
("jj"
            ["\\jmath"
                                    ])
("nab"
           ["\\nabla"
                                    ])
("cm"
           ["\\checkmark"
                                    ])
;; Symbols spaces
("qu"
            ["\\quad"
                                    ])
                                    ])
("quu"
            ["\\qquad"
;; Symbols arrow1
("<-"
           ["\\leftarrow"
                                    ])
                                        ; left arrow
```

```
("->"
           ["\\rightarrow"
                                   ])
                                        ; right arrow
("-^"
           ["\\uparrow"
                                   ])
                                        ; up arrow
("-v"
           ["\\downarrow"
                                   1)
                                        ; down arrow
("<->"
           ["\\leftrightarrow"
                                   1)
                                       ; left-right arrow
("<-n"
           ["\\nleftarrow"
                                   ])
                                        ; not left arrow
("->n"
           ["\\nrightarrow"
                                   1)
                                        ; not right arrow
("-^n"
                                   1)
           ["\\nuparrow"
                                        ; not up arrow
("-vn"
           ["\\ndownarrow"
                                   ])
                                        ; not down arrow
("<->"
           ["\\nleftrightarrow"
                                   1)
                                        ; not left-right arrow
("-->"
           ["\\longrightarrow"
                                   ])
("<--"
           ["\\longleftarrow"
                                   ])
("\\vert ->" ["\\mapsto"
                                      ])
;; Symbols arrow2
("<="
           ["\\Leftarrow"
                                   ])
                                        ; left arrow
("=>"
           ["\\Rightarrow"
                                   ])
                                        ; right arrow
("=~"
                                   ])
           ["\\Uparrow"
                                        ; up arrow
("=v"
           ["\\Downarrow"
                                   1)
                                        ; down arrow
("<=>"
           ["\\Leftrightarrow"
                                   ])
                                       ; left-right arrow
("iff"
           ["\\Leftrightarrow"
                                   ])
                                        ; left-right arrow
("<=n"
           ["\\nLeftarrow"
                                   ])
                                        ; left arrow
("=>n"
           ["\\nRightarrow"
                                   ])
                                        ; right arrow
                                   ])
("<=>n"
           ["\\nLeftrightarrow"
                                        ; left-right arrow
("iffn"
           ["\\nLeftrightarrow"
                                   ])
                                        ; left-right arrow
("<==>"
           ["\\Longleftrightarrow"])
                                        ; left-right arrow
("<=="
           ["\\Longleftarrow"
                                   ])
                                        ; left-right arrow
("==>"
           ["\\Longrightarrow"
                                   ])
                                        ; left-right arrow
;; Symbols arrow3
("<---"
           ["\\xleftarrow[ ]{ }" ])
("--->"
           ["\\xrightarrow[]{}"])
("===>"
           ["\\xRightarrow[]{}"])
                                        ; ~mathtools~ lib required
("<==="
           ["\\xLeftarrow[ ]{ }" ])
                                        ; ~ mathtools ~ lib required
;; Symbols arrow3
("vec"
           ["\\vec"
                                   ])
("bar"
           ["\\bar"
                                   1)
("hat"
           ["\\hat"
                                   1)
("dot"
           ["\\dot"
                                   ])
                                   ])
("dot."
           ["\\ddot"
("dot.."
                                   ])
           ["\\dddot"
("dot..."
           ["\\ddddot"
                                   1)
("dag"
           ["^\\dagger"
                                   ])
```

```
("dag."
            ["^\\ddagger"
                                    ])
                                    ])
("*.."
            ["^*"
("deg"
           ["^\\circ"
                                    ])
("tr"
           ["^T"
                                    ])
("tr."
           ["^{-T}"
                                    ])
;; Operation: arith
("+-"
           ["\\pm"
                                    ])
("-+"
            "\mp"
                                    ])
("*x"
            ["\\times"
                                    ])
("::"
           ["\\div"
                                    ])
("**"
           ["\\cdot"
                                    ])
;; Operation: arith
("=n"
            ["\\neq"
                                    ])
("=."
            ["\\equiv"
                                    ])
                                        ;
("=?"
            ["\\stackrel{?}{=}"
                                    ])
("=y"
            ["\\stackrel{\\checkmark}{=}"])
("3="
            ["\\equiv"
                                    ])
("=:"
            ["\\coloneqq"
                                    ])
                                        ;
(":="
            ["\\coloneqq"
                                    ])
("=.="
            ["\\sim"
                                    ])
("=n="
           ["\\nsim"
                                    ])
(""
            ["\\approx"
                                    ])
("<n"
            ["\\nless"
                                    ])
                                    1)
("<."
            ["\\leq"
("<.n"
                                    ])
           ["\\nleq"
("<?"
            ["\\stackrel{?}{<}"
                                    ])
("<y"
            ["\\stackrel{\\checkmark}{<}"])
("<.?"
            ["\\stackrel{?}{\\leq}"])
("<.y"
           ["\\stackrel{\\checkmark}{\\leq}"])
("<<"
           ["\\11"
                                    ])
("<<?"
            ["\\stackrel{?}{\\ll}" ])
("<<y"
            ["\\stackrel{\\checkmark}{\\ll}"])
(">n"
            ["\\ngtr"
                                    ])
(">."
            ["\\geq"
                                    ])
(">.n"
            ["\\ngeq"
                                    ])
(">?"
           ["\\stackrel{?}{>}"
                                    ])
(">y"
            ["\\stackrel{\\checkmark}{>}"])
(">.?"
            ["\\stackrel{?}{\\geq}"])
           ["\\stackrel{\\checkmark}{\\geq}"]) ;
(">.y"
(">>"
           ["\\gg"
                                    ]) ;
```

```
(">>?"
            ["\\stackrel{?}{\\gg}" ])
(">>y"
            ["\\stackrel{\\checkmark}{\\gg}"])
;; Operation: arith
("in"
            ["\\in"
                                    ])
("in."
            ["\\ni"
                                    ])
("ni"
            ["\\ni"
                                    ])
("inn"
            ["\\notin"
                                    ])
("0/"
                                    ])
            ["\\emptyset"
            ["\\mathbb{R}"
                                    ])
("nsr"
("nsc"
            ["\\mathbb{C}"
                                    ])
("nsn"
            ["\\mathbb{N}"
                                    ])
("nsp"
            ["\\mathbb{P}"
                                    ])
("nsz"
            ["\\mathbb{Z}"
                                    ])
                                    ])
("nsi"
            ["\\mathbb{I}"
("sub"
            ["\\subset"
                                    ])
("subn"
            ["\\nssubseteq"
                                    ])
("sub="
                                    ])
            ["\\subseteq"
("sub=n"
            ["\\nsubseteq"
                                    ])
("subn="
                                    ])
            ["\\nsubseteq"
("sup"
            ["\\supset"
                                    ])
                                    ])
("supn"
            ["\\nsupseteq"
                                    ])
("sup="
            ["\\supeseteq"
("sup=n"
            ["\\nsupseteq"
                                    ])
("supn="
                                    1)
            ["\\nsupseteq"
;; Operation: arith
("or"
            ["\\lor"
                                    ])
("and"
            ["\\lnd"
                                    ])
("not"
            ["\\neg"
                                    ])
("or."
            ["\\text{ or }"
                                    ])
            ["\\text{ and }"
                                    ])
("and."
("not."
            ["\\text{ not }"
                                    ])
;; Func: main
("rank"
            ["\\mathrm{rank}"
                                    ])
("arg"
            ["\\arg"
                                    ])
("det"
            ["\\det"
                                    ])
("dim"
            ["\\dim"
                                    ])
("exp"
            ["\\exp"
                                    ])
                                    ])
("Im"
            ["\\mathrm{Im}"
("Re"
            ["\\mathrm{Re}"
                                    ])
("ln"
            ["\\ln"
                                    ])
```

```
("log"
           ["\\log"
                                    ])
("max"
           ["\\max"
                                    ])
("min"
           ["\\min"
                                    ])
("dim"
           ["\\dim"
                                    ])
("sqrt"
           ["\\sqrt"
                                    ])
                                    ])
("mod"
           ["\\pmod"
("mod."
                                    ])
           ["\\mod"
("mod.."
           ["\\bmod"
                                    ])
;; Func: Trig
("cos"
          ["\\cos"
                             ])
                                  ("cosh"
                                            ["\\cosh"
                                                               ])
          ["\\sin"
                                            ["\ \ ]
                                                               ])
("sin"
                             ])
                                  ("sinh"
("tan"
          ["\\tan"
                             ])
                                  ("tanh"
                                            ["\\tanh"
                                                               ])
                                            ["\\coth"
("cot"
          ["\\cot"
                             ])
                                  ("coth"
                                                               ])
                                                               ])
("acos"
          ["\\arccos"
                             ])
                                  ("cos."
                                            ["\\arccos"
("asin"
          ["\\arcsin"
                             ])
                                  ("sin."
                                            ["\\arcsin"
                                                               ])
("atan"
          ["\\arctan"
                             ])
                                  ("tan."
                                            ["\\arctan"
                                                               ])
;; Func: iter
("il"
           ["\\limits_{ }^{ }"
                                    ])
("lim"
           ["\\lim"
                                    ])
("sum"
           ["\\sum"
                                    ])
                                    ])
("prod"
           ["\\prod"
("int"
           ["\\int"
                                    ])
("inti"
           ["\\iint"
                                    ])
("intii"
                                    1)
           ["\\iiint"
("intiii"
           ["\\iiiint"
                                    ])
("into"
           ["\\oint"
                                    ])
           ["\\sum\\limits_{ i=1 }^{ n }"]) ;
("sum."
           ["\\prod\\limits_{ i=1 }^{ n }"])
("prod."
           ["\\int\\limits_{ -\\infty }^{ -\\infty }"])
("int."
("inti."
           ["\\iint\\limits_{ C }"])
("intii."
           ["\\iiint\\limits_{ C }"])
("intiii."
            ["\\iiiint\\limits_{ C }"])
("into."
           ["\\oint\\limits_{ C }"])
;; Structural: Parenthesis
("()."
           ["\\left( \\right)"
                                    ])
("().."
           ["\\left( \\middle\\vert
                                      \\right)"])
("[]."
           ["\\left[ \\right]"
                                    ])
("[].."
           ["\\left[ \\middle\\vert \\right]"])
("[].c"
           ["\\lceil \\rceil"
                                    ])
                                       ;
           ["\\lfloor \\floor"
("[].f"
                                    ])
```

```
("{}."
                ["\\left\\{ \\right\\}"]) ;
                ["\\left\\{ \\middle\\vert \\right\\}"]) ;
    ("{}.."
    ("\\vert\\vert ." ["\\left\\vert \\right\\vert"]) ;
    ;; Structural: Text
    ("te"
                ["\\text{}"
                                        ])
    ("tr"
                ["\\mathrm{}"
                                        ])
                                        ])
    ("tb"
                ["\\mathbf{}"
                                            ;
    ("ti"
                ["\\mathit{}"
                                        ])
    ;; Structural: Text
    ("te"
                ["\\text{}"
                                        ])
    ("tr"
                ["\\mathrm{}"
                                        ])
    ("tb"
                ["\\mathbf{}"
                                        ])
    ("ti"
                ["\\mathit{}"
                                        ])
    ;; Structural: Sub-sup-scripts
               ["^{"
                                      ("11"
                                                 ["_{"
                                                                   ])
    ("pp"
                                 ])
               ["^0"
                                 ])
                                      ("10"
                                                 ["_0"
                                                                   ])
    ("p0"
               ["^1"
                                                 ["_1"
                                                                   ])
    ("p1"
                                 1)
                                      ("11"
    ("p2"
               ["^2"
                                 1)
                                      ("12"
                                                 ["_2"
                                                                   ])
               ["^3"
                                                 ["_3"
                                                                   ])
    ("p3"
                                 1)
                                      ("13"
    ("p4"
               ["^4"
                                 ])
                                      ("14"
                                                 ["_4"
                                                                   ])
    ("pn"
               ["^n"
                                                 ["_n"
                                                                   ])
                                 ])
                                      ("lnn"
                                                 ["_i"
                                                                   ])
    ("px")
               ["^X"
                                 ])
                                      ("li"
    ("__"
               ["\\underset{ }{ }"]) ("^~"
                                                  ["\\overset{ }{ }"])
    ("__."
               ["\\underbrace{ }_{ }"]) ("^^."
                                                     ["\\overbrace{ }^{ }"])
               ["\\underline{ }" ]) ("^^.." ["\\overline{ }" ])
    ("__.."
    ;; Structural: misc
    ("binom"
                ["\\binom"
                                        ])
    ("box"
                ["\\boxed"
                                        ])
    ("can"
                ["\\cancel"
                                        ])
                                            ; requires ~cancel~
                ["&=\\n\\\\\"
    ("&="
                                        ])
    ("=%"
                ["&=\\n\\\\\"
                                        ])
    ;; Structural: xy
    ("xy"
                ["\\xymatrix{\\n\\n}"
                                        ])
    ("bu"
                ["\\bullet"
                                        ])
    ("ar"
                ["\\ar"
                                        ])
)
```

10 Execuation el

```
(defun quail-func-init ()
  (quail-delete-region)
 (setq quail-current-str nil
       quail-converting nil
       quail-conversion-str ""))
(defun quail-func-end ()
 (throw 'quail-tag nil))
(defun quail-TeQ-equation (key idx)
  (quail-func-init)
 (insert "\begin{equation}\n\n\\end{equation}")
 (previous-line)
  (quail-func-end))
(defun quail-TeQ-aligned (key idx)
  (quail-func-init)
 (insert "\\begin{aligned}\n\n\\end{aligned}")
  (previous-line)
  (quail-func-end))
(defun quail-TeQ-endofline (key idx)
  (quail-func-init)
  (end-of-line)
 (insert "\\\\n")
  (quail-func-end))
(defun quail-TeQ-frac (key idx)
  (quail-func-init)
 (backward-sexp) (kill-sexp)
 (if (looking-back "[a-zA-Z]" 0)
     (progn
       (backward-word)
       (if (= (preceding-char) ?\\ )
           (progn (message "yes") (kill-word 1)
                  (backward-delete-char 1) (insert "\\frac{\\")
```