<table>
<tr><th colspan="3">Z Paragraphs, Declarations</th></tr>
<tr><th>LaTeX input</th><th>Output</th><th>Meaning</th></tr>
<tr><td>[X]</td><td>$[X]$</td><td>given set</td></tr>
<tr><td>\begin{axdef}
D
\where
P
\end{axdef}</td><td>D
P</td><td>axiomatic box</td></tr>
<tr><td>\begin{schema}{S}
D
\where
P
\end{schema}</td><td>S
D
P</td><td>schema box</td></tr>
<tr><td>\begin{gendef}[X]
D
\where
P
\end{gendef}</td><td>$[X]$
D
P</td><td>generic box</td></tr>
<tr><td>S \defs T</td><td>$S \mathrel{\widehat=} T$</td><td>horizontal schema definition</td></tr>
<tr><td>X == e</td><td>$X == e$</td><td>abbreviation definition</td></tr>
<tr><td>T ::=
A |
B\ldata E\rdata</td><td>$T ::=$
$A \mid$
$B \langle\!\langle E \rangle\!\rangle$</td><td>free type definition</td></tr>
</table>

<table>
<tr><th colspan="3">Expressions</th></tr>
<tr><th>LaTeX input</th><th>Output</th><th>Meaning</th></tr>
<tr><td>(a, b)</td><td>(a, b)</td><td>tuple</td></tr>
<tr><td>\{a, b\}</td><td>$\{a, b\}$</td><td>set display</td></tr>
<tr><td>\power X</td><td>$\mathbb{P}\, X$</td><td>power set</td></tr>
<tr><td>X \cross Y</td><td>$X \times Y$</td><td>cross product</td></tr>
<tr><td>\{~D | P @ E~\}</td><td>$\{\, D \mid P \bullet E \,\}$</td><td>set comprehension</td></tr>
<tr><td>(\lambda ST @ E)</td><td>$(\lambda\, ST \bullet E)$</td><td>lambda expression</td></tr>
<tr><td>(\mu ST @ E)</td><td>$(\mu\, ST \bullet E)$</td><td>definite description</td></tr>
<tr><td>(\LET V==E1
@ E2</td><td>$(\mathbf{let}\ V == E1 \bullet E2$</td><td>local definition</td></tr>
<tr><td>E1~E2</td><td>$E1\ E2$</td><td>function application</td></tr>
<tr><td>a.b</td><td>$a.b$</td><td>selection</td></tr>
<tr><td>\theta S</td><td>θS</td><td>binding formation</td></tr>
<tr><td>\IF P
\THEN E1
\ELSE E2</td><td>$\mathbf{if}\ P$
$\mathbf{then}\ E1$
$\mathbf{else}\ E2$</td><td>conditional</td></tr>
<tr><td>\langle E \rangle</td><td>$\langle E \rangle$</td><td>sequence display</td></tr>
<tr><td>\lbag E \rbag</td><td>$[\![E]\!]$</td><td>bag display</td></tr>
<tr><td>\neg n</td><td>$\bar{}\, n$</td><td>negative numeral</td></tr>
<tr><td>\lblot D \rblot</td><td>$\langle\!| D |\!\rangle$</td><td>binding set</td></tr>
<tr><td>x!</td><td>$x!$</td><td>decoration</td></tr>
<tr><td>x?</td><td>$x?$</td><td>decoration</td></tr>
<tr><td>x'</td><td>x'</td><td>decoration</td></tr>
<tr><td>x_n</td><td>x_n</td><td>decoration (n a digit)</td></tr>
<tr><td>_</td><td>_</td><td>underscore (in opnames)</td></tr>
</table>

<table>
<tr><th colspan="3">Predicates</th></tr>
<tr><th>LaTeX input</th><th>Output</th><th>Meaning</th></tr>
<tr><td>x = y</td><td>$x = y$</td><td>equality</td></tr>
<tr><td>x \in S</td><td>$x \in S$</td><td>membership</td></tr>
<tr><td>\lnot P</td><td>$\neg P$</td><td>negation</td></tr>
<tr><td>P \land Q</td><td>$P \land Q$</td><td>conjunction</td></tr>
<tr><td>P \lor Q</td><td>$P \lor Q$</td><td>disjunction</td></tr>
<tr><td>P \implies Q</td><td>$P \Rightarrow Q$</td><td>implication</td></tr>
<tr><td>P \iff Q</td><td>$P \Leftrightarrow Q$</td><td>equivalence</td></tr>
<tr><td>\forall ST @ P</td><td>$\forall\, ST \bullet P$</td><td>universal quantification</td></tr>
<tr><td>\exists ST @ P</td><td>$\exists\, ST \bullet P$</td><td>existential quantification</td></tr>
<tr><td>\exists_1 ST @ P</td><td>$\exists_1\, ST \bullet P$</td><td>unique quantification</td></tr>
<tr><td>\LET V==E
@ P</td><td>$\mathbf{let}\ V == E \bullet P$</td><td>local definition</td></tr>
<tr><td>\pre S</td><td>$\mathrm{pre}\ S$</td><td>schema pre-condition</td></tr>
<tr><td>a \inrel{R} b</td><td>$a\ \underline{R}\ b$</td><td>infix relation</td></tr>
<tr><td>\IF P
\THEN Q
\ELSE R</td><td>$\mathbf{if}\ P$
$\mathbf{then}\ Q$
$\mathbf{else}\ R$</td><td>conditional</td></tr>
</table>

<table>
<tr><th colspan="3">Schema Expressions</th></tr>
<tr><th>LaTeX input</th><th>Output</th><th>Meaning</th></tr>
<tr><td>\Delta S</td><td>ΔS</td><td>schema name prefix</td></tr>
<tr><td>\Xi S</td><td>ΞS</td><td>schema name prefix</td></tr>
<tr><td>\lnot S</td><td>$\neg S$</td><td>negation</td></tr>
<tr><td>S \land T</td><td>$S \land T$</td><td>conjunction</td></tr>
<tr><td>S \lor T</td><td>$S \lor T$</td><td>disjunction</td></tr>
<tr><td>S \implies T</td><td>$S \Rightarrow T$</td><td>implication</td></tr>
<tr><td>S \iff T</td><td>$S \Leftrightarrow T$</td><td>equivalence</td></tr>
<tr><td>\forall ST @ S</td><td>$\forall\, ST \bullet S$</td><td>universal quantification</td></tr>
<tr><td>\exists ST @ S</td><td>$\exists\, ST \bullet S$</td><td>existential quantification</td></tr>
<tr><td>\exists_1 ST @ S</td><td>$\exists_1\, ST \bullet S$</td><td>unique quantification</td></tr>
<tr><td>S \hide (a)</td><td>$S \setminus (a)$</td><td>hiding</td></tr>
<tr><td>S \project T</td><td>$S \upharpoonright T$</td><td>projection</td></tr>
<tr><td>\pre S</td><td>$\mathrm{pre}\ S$</td><td>pre-condition</td></tr>
<tr><td>S \semi T</td><td>$S \fatsemi T$</td><td>sequential composition</td></tr>
<tr><td>S \pipe T</td><td>$S \gg T$</td><td>piping</td></tr>
</table>

<table>
<tr><th colspan="3">Sets</th></tr>
<tr><th>LaTeX input</th><th>Output</th><th>Meaning</th></tr>
<tr><td>x \neq y</td><td>$x \neq y$</td><td>inequality</td></tr>
<tr><td>x \notin S</td><td>$x \notin S$</td><td>non-membership</td></tr>
<tr><td>\emptyset</td><td>$\emptyset$</td><td>empty set</td></tr>
<tr><td>S \subseteq T</td><td>$S \subseteq T$</td><td>subset</td></tr>
<tr><td>S \subset T</td><td>$S \subset T$</td><td>proper subset</td></tr>
<tr><td>\power_1 X</td><td>$\mathbb{P}_1\, X$</td><td>non-empty powerset</td></tr>
<tr><td>S \cup T</td><td>$S \cup T$</td><td>set union</td></tr>
<tr><td>S \cap T</td><td>$S \cap T$</td><td>set intersection</td></tr>
<tr><td>S \setminus T</td><td>$S \setminus T$</td><td>set difference</td></tr>
<tr><td>\bigcup S</td><td>$\bigcup S$</td><td>generalized union</td></tr>
<tr><td>\bigcap S</td><td>$\bigcap S$</td><td>generalized intersection</td></tr>
<tr><td>first~x</td><td>$\mathit{first}\ x$</td><td>first component of ordered pair</td></tr>
<tr><td>second~x</td><td>$\mathit{second}\ x$</td><td>second component of ordered pair</td></tr>
</table>

Relations		
LaTeX input	Output	Meaning
`X \rel Y`	$X \leftrightarrow Y$	relation
`x \mapsto y`	$x \mapsto y$	maplet (ordered pair)
`\dom X`	dom X	domain
`\ran X`	ran X	range
`\id X`	id X	identity relation
`Q \comp R`	$Q \fatsemi R$	relational composition
`R \circ Q`	$R \circ Q$	backward relational composition
`S \dres R`	$S \lhd R$	domain restriction
`R \rres T`	$R \rhd T$	range restriction
`S \ndres R`	$S ⩤ R$	domain anti-restriction
`R \nrres T`	$R ⩥ T$	range anti-restriction
`R \inv`	$R^{\sim}$	relational inversion
`R \limg S \rimg`	$R(\!\| S \|\!)$	relational image
`Q \oplus R`	$Q \oplus R$	overriding
`R \plus`	R^{+}	transitive closure
`R \star`	R^{*}	reflexive transitive closure

Functions		
LaTeX input	Output	Meaning
`X \pfun Y`	$X ⇸ Y$	partial function
`X \fun Y`	$X \rightarrow Y$	total function
`X \pinj Y`	$X ⤔ Y$	partial injection
`X \inj Y`	$X \rightarrowtail Y$	total injection
`X \psurj Y`	$X ⤀ Y$	partial surjection
`X \surj Y`	$X \twoheadrightarrow Y$	total surjection
`X \bij Y`	$X ⤖ Y$	bijection

Sequences		
LaTeX input	Output	Meaning
`\seq X`	seq X	finite sequence
`\seq_1 X`	$\mathrm{seq}_1\ X$	non-empty finite sequence
`\iseq X`	iseq X	injective sequence
`s \cat t`	$s \frown t$	concatenation
`rev~s`	$\mathit{rev}\ s$	reversal
`head~s`	$\mathit{head}\ s$	first element
`last~s`	$\mathit{last}\ s$	last element
`tail~s`	$\mathit{tail}\ s$	all but the first element
`front~s`	$\mathit{front}\ s$	all but the last element
`U \extract s`	$U \upharpoonleft s$	extraction
`s \filter V`	$s \upharpoonright V$	filter
`squash~f`	$\mathit{squash}\ f$	compaction
`s \prefix t`	s prefix t	prefix relation
`s \suffix t`	s suffix t	suffix relation
`s \inseq t`	s in t	segment relation
`\dcat q`	$\frown/\ q$	distributed concatenation
`\disjoint S`	disjoint S	disjointness
`S \partition T`	S partition T	partition

Numbers and Finiteness		
LaTeX input	Output	Meaning
`\nat`	$\mathbb{N}$	natural numbers
`\num`	$\mathbb{Z}$	integers
`a + b`	$a + b$	addition
`a - b`	$a - b$	subtraction
`a * b`	$a * b$	multiplication
`a \div b`	$a \mathbin{\mathsf{div}} b$	division
`a \mod b`	$a \mathbin{\mathsf{mod}} b$	modulus
`a < b`	$a < b$	less than
`a \leq b`	$a \leq b$	less than or equal to
`a \geq b`	$a \geq b$	greater than or equal to
`a > b`	$a > b$	greater than
`\nat_1`	$\mathbb{N}_1$	positive integers
`succ~a`	$\mathit{succ}\ a$	successor
`a \upto b`	$a \mathrel{..} b$	number range
`R^{k}`	R^{k}	iteration
`R \bsup k \esup`	R^{k}	iteration
`\finset`	$\mathbb{F}$	finite set
`\finset_1`	$\mathbb{F}_1$	non-empty finite set
`\# X`	$\# X$	number of members of a finite set
`X \ffun Y`	$X ⇻ Y$	finite partial function
`X \finj Y`	$X ⤕ Y$	finite partial injection
`min~S`	$\mathit{min}\ S$	minimum of a set of numbers
`max~S`	$\mathit{max}\ S$	maximum of a set of numbers

Bags		
LaTeX input	Output	Meaning
`\bag`	bag	bags
`count~B~x`	$\mathit{count}\ B\ x$	multiplicity
`B \bcount x`	$B \sharp x$	multiplicity
`n \otimes B`	$n \otimes B$	bag scaling
`x \inbag B`	x in B	bag membership
`B \subbageq C`	$B \sqsubseteq C$	sub-bag relation
`B \uplus C`	$B \uplus C$	bag union
`B \uminus C`	$B ⩁ C$	bag difference
`items~s`	$\mathit{items}\ s$	bag of sequence elements

Miscellaneous, Spacing		
LaTeX input	Output	Meaning
`\spot`, `@`	$\bullet$	separator
`\mid`, `|`	$\mid$	separator
`p \bind x`	$p \leadsto x$	variable binding
`\\`		newline
`\!`	xx	negative thin space
`␣` (a space)	xx	normal space
`\,`	$x\,x$	thin space
`~`	$x\,x$	thin space
`\:`	$x\:x$	medium space
`\;`	$x\;x$	thick space
`\␣` (a space)	$x\ x$	interword space
`\tn`	$x \qquad x$	`n` quad spaces (`n` a digit)