Z/EVES dialect of Z in LaTeX (z-eves.sty)

Z Paragraphs, Declarations		
LaTeX input	Output	Meaning
`[X]`	$[X]$	given set

`\begin{axdef}`
`  D`
`\where`
`  P`
`\end{axdef}`
	D
	———
	P
		axiomatic box

`\begin{schema}{S}`
`  D`
`\where`
`  P`
`\end{schema}`
	S
	D
	———
	P
		schema box

`\begin{gendef}[X]`
`  D`
`\where`
`  P`
`\end{gendef}`
	$[X]$
	D
	———
	P
		generic box

`S \defs T`	$S \mathrel{\widehat=} T$	horizontal schema definition
`X == e`	$X == e$	abbreviation definition

`T ::=`
`  A |`
`  B\ldata E\rdata`
	$T ::=$
	$A \mid$
	$B \langle\!\langle E \rangle\!\rangle$
		free type definition

\also like "\\", but additional vertical space

Expressions		
LaTeX input	Output	Meaning
`(a, b)`	(a, b)	tuple
`\{a, b\}`	$\{a, b\}$	set display
`\power X`	$\mathbb{P} X$	power set
`X \cross Y`	$X \times Y$	cross product
`\{~D | P @ E~\}`	$\{ D \mid P \bullet E \}$	set comprehension
`(\lambda ST @ E)`	$(\lambda ST \bullet E)$	lambda expression
`(\mu ST @ E)`	$(\mu ST \bullet E)$	definite description
`(\LET V==E1` `  @ E2`	(**let** $V ==$ $E1$ $\bullet E2$	local definition
`E1~E2`	$E1\ E2$	function application
`a.b`	$a.b$	selection
`\theta S`	θS	binding formation

`\IF P`
`  \THEN E1`
`  \ELSE E2`
	if P
	then $E1$
	else $E2$
		conditional

`\langle E \rangle`	$\langle E \rangle$	sequence display
`\lbag E \rbag`	$[\![E]\!]$	bag display
`\neg n`	n	negative numeral
`\lblot D \rblot`	$\langle\!\vert D \vert\!\rangle$	binding set
`x!`	$x!$	decoration
`x?`	$x?$	decoration
`x'`	x'	decoration
`x_n`	x_n	decoration (`n` a digit)
`\_`	_	underscore (in opnames)

Predicates		
LaTeX input	Output	Meaning
`x = y`	$x = y$	equality
`x \in S`	$x \in S$	membership
`\lnot P`	$\neg P$	negation
`P \land Q`	$P \land Q$	conjunction
`P \lor Q`	$P \lor Q$	disjunction
`P \implies Q`	$P \Rightarrow Q$	implication
`P \iff Q`	$P \Leftrightarrow Q$	equivalence
`\forall ST @ P`	$\forall ST \bullet P$	universal quantification
`\exists ST @ P`	$\exists ST \bullet P$	existential quantification
`\exists_1 ST @ P`	$\exists_1 ST \bullet P$	unique quantification
`\LET V==E` `  @ P`	**let** $V ==$ E $\bullet P$	local definition
`\pre S`	pre S	schema pre-condition
`a \inrel{R} b`	$a \mathrel{\underline{R}} b$	infix relation

`\IF P`
`  \THEN Q`
`  \ELSE R`
	if P
	then Q
	else R
		conditional

Schema Expressions		
LaTeX input	Output	Meaning
`\Delta S`	ΔS	schema name prefix
`\Xi S`	ΞS	schema name prefix
`\lnot S`	$\neg S$	negation
`S \land T`	$S \land T$	conjunction
`S \lor T`	$S \lor T$	disjunction
`S \implies T`	$S \Rightarrow T$	implication
`S \iff T`	$S \Leftrightarrow T$	equivalence
`\forall ST @ S`	$\forall ST \bullet S$	universal quantification
`\exists ST @ S`	$\exists ST \bullet S$	existential quantification
`\exists_1 ST @ S`	$\exists_1 ST \bullet S$	unique quantification
`S \hide (a)`	$S \setminus (a)$	hiding
`S \project T`	$S \upharpoonright T$	projection
`\pre S`	pre S	pre-condition
`S \semi T`	$S \fatsemi T$	sequential composition
`S \pipe T`	$S \gg T$	piping

Sets		
LaTeX input	Output	Meaning
`x \neq y`	$x \neq y$	inequality
`x \notin S`	$x \notin S$	non-membership
`\emptyset`	$\emptyset$	empty set
`S \subseteq T`	$S \subseteq T$	subset
`S \subset T`	$S \subset T$	proper subset
`\power_1 X`	$\mathbb{P}_1 X$	non-empty powerset
`S \cup T`	$S \cup T$	set union
`S \cap T`	$S \cap T$	set intersection
`S \setminus T`	$S \setminus T$	set difference
`\bigcup S`	$\bigcup S$	generalized union
`\bigcap S`	$\bigcap S$	generalized intersection
`first~x`	$first\ x$	first component of ordered pair
`second~x`	$second\ x$	second component of ordered pair

Relations		
LaTeX input	Output	Meaning
`X \rel Y`	$X \leftrightarrow Y$	relation
`x \mapsto y`	$x \mapsto y$	maplet (ordered pair)
`\dom X`	$\mathrm{dom}\, X$	domain
`\ran X`	$\mathrm{ran}\, X$	range
`\id X`	$\mathrm{id}\, X$	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`	$S \mathbin{⩤} R$	domain anti-restriction
`R \nrres T`	$R \mathbin{⩥} T$	range anti-restriction
`R \inv`	$R^\sim$	relational inversion
`R \limg S \rimg`	$R(\!\mid S \mid\!)$	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`	$X \pfun Y$	partial function
`X \fun Y`	$X \fun Y$	total function
`X \pinj Y`	$X \pinj Y$	partial injection
`X \inj Y`	$X \inj Y$	total injection
`X \psurj Y`	$X \psurj Y$	partial surjection
`X \surj Y`	$X \surj Y$	total surjection
`X \bij Y`	$X \bij Y$	bijection

Sequences		
LaTeX input	Output	Meaning
`\seq X`	$\mathrm{seq}\, X$	finite sequence
`\seq_1 X`	$\mathrm{seq}_1\, X$	non-empty finite sequence
`\iseq X`	$\mathrm{iseq}\, X$	injective sequence
`s \cat t`	$s \mathbin{⌢} t$	concatenation
`rev~s`	$rev\ s$	reversal
`head~s`	$head\ s$	first element
`last~s`	$last\ s$	last element
`tail~s`	$tail\ s$	all but the first element
`front~s`	$front\ s$	all but the last element
`U \extract s`	$U \upharpoonright s$	extraction
`s \filter V`	$s \upharpoonright V$	filter
`squash~f`	$squash\ f$	compaction
`s \prefix t`	$s \mathbin{\mathsf{prefix}} t$	prefix relation
`s \suffix t`	$s \mathbin{\mathsf{suffix}} t$	suffix relation
`s \inseq t`	$s \mathbin{\mathsf{in}} t$	segment relation
`\dcat q`	$⌢\!/\, q$	distributed concatenation
`\disjoint S`	$\mathsf{disjoint}\ S$	disjointness
`S \partition T`	$S \mathbin{\mathsf{partition}} T$	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`	$succ\ a$	successor
`a \upto b`	$a \mathinner{..} b$	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`	$X \ffun Y$	finite partial function
`X \finj Y`	$X \finj Y$	finite partial injection
`min~S`	$min\ S$	minimum of a set of numbers
`max~S`	$max\ S$	maximum of a set of numbers

Bags		
LaTeX input	Output	Meaning
`\bag`	bag	bags
`count~B~x`	$count\ B\ x$	multiplicity
`B \bcount x`	$B \mathbin{\sharp} x$	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`	$B \mathbin{⊎} C$	bag difference
`items~s`	$items\ s$	bag of sequence elements

Miscellaneous, Spacing		
LaTeX input	Output	Meaning
`\spot`, `@`	$\bullet$	separator
`\mid`, `|`	$\mid$	separator
`p \bind x`	$p \rightsquigarrow x$	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`	$x \quad x$	`n` quad spaces (`n` a digit)