

# Logiweb sequent calculus, Chores

Klaus Grue

GRD-2006-06-21.UTC:07:46:29.118507

## Contents

<b>1</b>	<b>Test cases</b>	<b>1</b>
<b>2</b>	<b>Pyk definitions</b>	<b>1</b>
<b>3</b>	<b>T<sub>E</sub>X definitions</b>	<b>5</b>
3.1	Variables . . . . .	15
<b>4</b>	<b>Priority table</b>	<b>17</b>

## 1 Test cases

## 2 Pyk definitions

$[[* \overset{\circ}{=} *] \xrightarrow{\text{pyk}}$  “general macro define " as " end define”]

$[\text{RootVisible}(*) \xrightarrow{\text{pyk}}$  “make root visible " end visible”]

$[A \xrightarrow{\text{pyk}}$  “sequent example axiom”]

$[R \xrightarrow{\text{pyk}}$  “sequent example rule”]

$[C \xrightarrow{\text{pyk}}$  “sequent example contradiction”]

$[T \xrightarrow{\text{pyk}}$  “sequent example theory”]

$[L \xrightarrow{\text{pyk}}$  “sequent example lemma”]

$[\{*\} \xrightarrow{\text{pyk}}$  “set " end set”]

$[\bar{*} \xrightarrow{\text{pyk}}$  “object var " end var”]

$[a \xrightarrow{\text{pyk}}$  “object a”]

$[b \xrightarrow{\text{pyk}}$  “object b”]

$[c \xrightarrow{\text{pyk}}$  “object c”]

$[d \xrightarrow{\text{pyk}}$  “object d”]

$[e \xrightarrow{\text{pyk}}$  “object e”]

$[f \xrightarrow{\text{pyk}}$  “object f”]

$[g \xrightarrow{\text{pyk}} \text{"object g"}]$

$[h \xrightarrow{\text{pyk}} \text{"object h"}]$

$[i \xrightarrow{\text{pyk}} \text{"object i"}]$

$[j \xrightarrow{\text{pyk}} \text{"object j"}]$

$[k \xrightarrow{\text{pyk}} \text{"object k"}]$

$[l \xrightarrow{\text{pyk}} \text{"object l"}]$

$[m \xrightarrow{\text{pyk}} \text{"object m"}]$

$[n \xrightarrow{\text{pyk}} \text{"object n"}]$

$[o \xrightarrow{\text{pyk}} \text{"object o"}]$

$[p \xrightarrow{\text{pyk}} \text{"object p"}]$

$[q \xrightarrow{\text{pyk}} \text{"object q"}]$

$[r \xrightarrow{\text{pyk}} \text{"object r"}]$

$[s \xrightarrow{\text{pyk}} \text{"object s"}]$

$[t \xrightarrow{\text{pyk}} \text{"object t"}]$

$[u \xrightarrow{\text{pyk}} \text{"object u"}]$

$[v \xrightarrow{\text{pyk}} \text{"object v"}]$

$[w \xrightarrow{\text{pyk}} \text{"object w"}]$

$[x \xrightarrow{\text{pyk}} \text{"object x"}]$

$[y \xrightarrow{\text{pyk}} \text{"object y"}]$

$[z \xrightarrow{\text{pyk}} \text{"object z"}]$

$[\langle * \equiv * \mid * := * \rangle \xrightarrow{\text{pyk}} \text{"sub " is " where " is " end sub"}]$

$[\langle * \equiv^0 * \mid * := * \rangle \xrightarrow{\text{pyk}} \text{"sub zero " is " where " is " end sub"}]$

$[\langle * \equiv^1 * \mid * := * \rangle \xrightarrow{\text{pyk}} \text{"sub one " is " where " is " end sub"}]$

$[\langle * \equiv^* * \mid * := * \rangle \xrightarrow{\text{pyk}} \text{"sub star " is " where " is " end sub"}]$

$[\text{Ded}(*, *) \xrightarrow{\text{pyk}} \text{"deduction " conclude " end deduction"}]$

$[\text{Ded}_0(*, *) \xrightarrow{\text{pyk}} \text{"deduction zero " conclude " end deduction"}]$

$[\text{Ded}_1(*, *, *) \xrightarrow{\text{pyk}} \text{"deduction one " conclude " condition " end deduction"}]$

$[\text{Ded}_2(*, *, *) \xrightarrow{\text{pyk}} \text{"deduction two " conclude " condition " end deduction"}]$

$[\text{Ded}_3(*, *, *, *) \xrightarrow{\text{pyk}} \text{"deduction three " conclude " condition " bound " end deduction"}]$

$[\text{Ded}_4(*, *, *, *) \xrightarrow{\text{pyk}} \text{"deduction four " conclude " condition " bound " end deduction"}]$

$[\text{Ded}_4^*(*, *, *, *) \xrightarrow{\text{pyk}} \text{"deduction four star " conclude " condition " bound " end deduction"}]$

$[\text{Ded}_5(*, *, *, *) \xrightarrow{\text{pyk}} \text{"deduction five " condition " bound " end deduction"}]$

$[\text{Ded}_6(*, *, *, *) \xrightarrow{\text{pyk}} \text{"deduction six " conclude " exception " bound " end"}]$

deduction”]

[Ded<sub>6</sub><sup>\*</sup>(\*, \*, \*, \*)  $\xrightarrow{\text{pyk}}$  “deduction six star " conclude " exception " bound " end deduction”]

[Ded<sub>7</sub>(\*)  $\xrightarrow{\text{pyk}}$  “deduction seven " end deduction”]

[Ded<sub>8</sub>(\*, \*)  $\xrightarrow{\text{pyk}}$  “deduction eight " bound " end deduction”]

[Ded<sub>8</sub><sup>\*</sup>(\*, \*)  $\xrightarrow{\text{pyk}}$  “deduction eight star " bound " end deduction”]

[S  $\xrightarrow{\text{pyk}}$  “system s”]

[Neg  $\xrightarrow{\text{pyk}}$  “double negation”]

[MP  $\xrightarrow{\text{pyk}}$  “rule mp”]

[Gen  $\xrightarrow{\text{pyk}}$  “rule gen”]

[rule div  $\xrightarrow{\text{pyk}}$  “rule div”]

[Ded  $\xrightarrow{\text{pyk}}$  “deduction”]

[S1  $\xrightarrow{\text{pyk}}$  “axiom s one”]

[S2  $\xrightarrow{\text{pyk}}$  “axiom s two”]

[S3  $\xrightarrow{\text{pyk}}$  “axiom s three”]

[S4  $\xrightarrow{\text{pyk}}$  “axiom s four”]

[S5  $\xrightarrow{\text{pyk}}$  “axiom s five”]

[S6  $\xrightarrow{\text{pyk}}$  “axiom s six”]

[S7  $\xrightarrow{\text{pyk}}$  “axiom s seven”]

[S8  $\xrightarrow{\text{pyk}}$  “axiom s eight”]

[S9  $\xrightarrow{\text{pyk}}$  “axiom s nine”]

[S10  $\xrightarrow{\text{pyk}}$  “axiom s ten”]

[Repetition  $\xrightarrow{\text{pyk}}$  “repetition”]

[A1'  $\xrightarrow{\text{pyk}}$  “lemma a one”]

[A2'  $\xrightarrow{\text{pyk}}$  “lemma a two”]

[A4'  $\xrightarrow{\text{pyk}}$  “lemma a four”]

[A5'  $\xrightarrow{\text{pyk}}$  “lemma a five”]

[Prop 3.2a  $\xrightarrow{\text{pyk}}$  “prop three two a”]

[Prop 3.2b  $\xrightarrow{\text{pyk}}$  “prop three two b”]

[Prop 3.2c  $\xrightarrow{\text{pyk}}$  “prop three two c”]

[Prop 3.2d  $\xrightarrow{\text{pyk}}$  “prop three two d”]

[Prop 3.2e<sub>1</sub>  $\xrightarrow{\text{pyk}}$  “prop three two e one”]

[Prop 3.2e<sub>2</sub>  $\xrightarrow{\text{pyk}}$  “prop three two e two”]

[Prop 3.2e  $\xrightarrow{\text{pyk}}$  “prop three two e”]

[Prop 3.2f<sub>1</sub>  $\xrightarrow{\text{pyk}}$  “prop three two f one”]

[Prop 3.2f<sub>2</sub>  $\xrightarrow{\text{pyk}}$  “prop three two f two”]

[Prop 3.2f  $\xrightarrow{\text{pyk}}$  “prop three two f”]  
 [Prop 3.2g<sub>1</sub>  $\xrightarrow{\text{pyk}}$  “prop three two g one”]  
 [Prop 3.2g<sub>2</sub>  $\xrightarrow{\text{pyk}}$  “prop three two g two”]  
 [Prop 3.2g  $\xrightarrow{\text{pyk}}$  “prop three two g”]  
 [Prop 3.2h<sub>1</sub>  $\xrightarrow{\text{pyk}}$  “prop three two h one”]  
 [Prop 3.2h<sub>2</sub>  $\xrightarrow{\text{pyk}}$  “prop three two h two”]  
 [Prop 3.2h  $\xrightarrow{\text{pyk}}$  “prop three two h”]  
 [Prop 3.2i  $\xrightarrow{\text{pyk}}$  “prop three two i”]  
 [Prop 3.2j<sub>1</sub>  $\xrightarrow{\text{pyk}}$  “prop three two j one”]  
 [Prop 3.2j<sub>2</sub>  $\xrightarrow{\text{pyk}}$  “prop three two j two”]  
 [Prop 3.2j  $\xrightarrow{\text{pyk}}$  “prop three two j”]  
 [Prop 3.2k<sub>1</sub>  $\xrightarrow{\text{pyk}}$  “prop three two k one”]  
 [Prop 3.2k<sub>2</sub>  $\xrightarrow{\text{pyk}}$  “prop three two k two”]  
 [Prop 3.2k  $\xrightarrow{\text{pyk}}$  “prop three two k”]  
 [Prop 3.2l<sub>1</sub>  $\xrightarrow{\text{pyk}}$  “prop three two l one”]  
 [Prop 3.2l<sub>2</sub>  $\xrightarrow{\text{pyk}}$  “prop three two l two”]  
 [Prop 3.2l  $\xrightarrow{\text{pyk}}$  “prop three two l”]  
 [Prop 3.2m<sub>1</sub>  $\xrightarrow{\text{pyk}}$  “prop three two m one”]  
 [Prop 3.2m<sub>2</sub>  $\xrightarrow{\text{pyk}}$  “prop three two m two”]  
 [Prop 3.2m  $\xrightarrow{\text{pyk}}$  “prop three two m”]  
 [Prop 3.2n<sub>1</sub>  $\xrightarrow{\text{pyk}}$  “prop three two n one”]  
 [Prop 3.2n<sub>2</sub>  $\xrightarrow{\text{pyk}}$  “prop three two n two”]  
 [Prop 3.2n  $\xrightarrow{\text{pyk}}$  “prop three two n”]  
 [Prop 3.2o  $\xrightarrow{\text{pyk}}$  “prop three two o”]  
 [Prop 3.4a<sub>1</sub>  $\xrightarrow{\text{pyk}}$  “prop three four a one”]  
 [Prop 3.4a<sub>2</sub>  $\xrightarrow{\text{pyk}}$  “prop three four a two”]  
 [Prop 3.4a  $\xrightarrow{\text{pyk}}$  “prop three four a”]  
 [Prop 3.4b  $\xrightarrow{\text{pyk}}$  “prop three four b”]  
 [Prop 3.4c<sub>1</sub>  $\xrightarrow{\text{pyk}}$  “prop three four c one”]  
 [Prop 3.4c<sub>2</sub>  $\xrightarrow{\text{pyk}}$  “prop three four c two”]  
 [Prop 3.4c  $\xrightarrow{\text{pyk}}$  “prop three four c”]  
 [Prop 3.4d<sub>1</sub>  $\xrightarrow{\text{pyk}}$  “prop three four d one”]  
 [Prop 3.4d<sub>2</sub>  $\xrightarrow{\text{pyk}}$  “prop three four d two”]  
 [Prop 3.4d  $\xrightarrow{\text{pyk}}$  “prop three four d”]  
 [Block<sub>1</sub>(\* , \* , \*)  $\xrightarrow{\text{pyk}}$  “block one " state " cache " end block”]

$[\text{Block}_2(*) \xrightarrow{\text{pyk}} \text{"block two " end block"}]$   
 $[* \text{hide} \xrightarrow{\text{pyk}} \text{" hide"}]$   
 $[\text{MacroIndent}(*) \xrightarrow{\text{pyk}} \text{"macro indent "}]$   
 $[* \text{' } \xrightarrow{\text{pyk}} \text{" suc"}]$   
 $[* = * \xrightarrow{\text{pyk}} \text{" equal "}]$   
 $[* \neq * \xrightarrow{\text{pyk}} \text{" unequal "}]$   
 $[* \text{var} \xrightarrow{\text{pyk}} \text{" is object var"}]$   
 $[* \#^0 * \xrightarrow{\text{pyk}} \text{" avoid zero "}]$   
 $[* \#^1 * \xrightarrow{\text{pyk}} \text{" avoid one "}]$   
 $[* \# * \xrightarrow{\text{pyk}} \text{" avoid star "}]$   
 $[\exists *: * \xrightarrow{\text{pyk}} \text{"exist " indeed "}]$   
 $[\forall *: * \xrightarrow{\text{pyk}} \text{"for all " indeed "}]$   
 $[\forall \text{obj} *: * \xrightarrow{\text{pyk}} \text{"for all objects " indeed "}]$   
 $[* \Rightarrow * \xrightarrow{\text{pyk}} \text{" imply "}]$   
 $[* \Leftrightarrow * \xrightarrow{\text{pyk}} \text{" if and only if "}]$   
 $[* \# * \xrightarrow{\text{pyk}} \text{" avoid "}]$   
 $[* \supseteq * \xrightarrow{\text{pyk}} \text{" object modus ponens "}]$   
 $[\Pi *: * \xrightarrow{\text{pyk}} \text{"for all terms " indeed "}]$   
 $[\text{Begin} *; * : \text{End}; * \xrightarrow{\text{pyk}} \text{"block " line " end block "}]$   
 $[\text{Last block line} * \gg *; * \xrightarrow{\text{pyk}} \text{"because " indeed " end line"}]$   
 $[\text{Arbitrary} \gg *; * \xrightarrow{\text{pyk}} \text{"any term " end line "}]$   
 $[* | * \xrightarrow{\text{pyk}} \text{" alternative "}]$   
 $[\rightarrow \xrightarrow{\text{pyk}} \text{"evaluates to"}]$   
 $[* \backslash * \xrightarrow{\text{pyk}} \text{" safe row "}]$   
 $[* || * \xrightarrow{\text{pyk}} \text{" divides "}]$   
 $[\text{opgave} \xrightarrow{\text{pyk}} \text{"opgave"}]$

### 3 T<sub>E</sub>X definitions

$[[x \stackrel{\circ}{=} y] \xrightarrow{\text{tex}} \text{"$   
 $\quad \quad \quad [\#1/\text{tex name}/\text{tex}.$   
 $\quad \quad \quad \backslash\text{stackrel}{\{\circ\}}{=} \#2.$   
 $\quad \quad \quad \text{"}]$   
 $[\text{RootVisible}(x) \xrightarrow{\text{tex}} \text{"\#1/\text{tex name}/\text{tex}."}]$   
 $[\text{RootVisible}(x) \xrightarrow{\text{name}} \text{"$

RootVisible(#1.  
)]

[x<sup>hide</sup>  $\xrightarrow{\text{tex}}$  “#1.  
{}<sup>{hide}</sup>”]

[x'  $\xrightarrow{\text{tex}}$  “#1.  
{}”]

[x = y  $\xrightarrow{\text{tex}}$  “#1.  
= #2.”]

[x  $\neq$  y  $\xrightarrow{\text{tex}}$  “#1.  
\neq #2.”]

[x  $\Rightarrow$  y  $\xrightarrow{\text{tex}}$  “#1.  
\Rightarrow #2.”]

[x  $\Leftrightarrow$  y  $\xrightarrow{\text{tex}}$  “#1.  
\Leftrightarrow #2.”]

[x | y  $\xrightarrow{\text{tex}}$  “#1.  
\mathrel{||} #2.”]

[ $\exists$ x:y  $\xrightarrow{\text{tex}}$  “  
\exists #1.  
\colon #2.”]

[ $\forall$ x:y  $\xrightarrow{\text{tex}}$  “  
\forall #1.  
\colon #2.”]

[ $\forall_{\text{obj}}$ x:y  $\xrightarrow{\text{tex}}$  “  
\forall\_{\text{obj}} #1.  
\colon #2.”]

[ $\Pi$ x:y  $\xrightarrow{\text{tex}}$  “  
\Pi #1.  
\colon #2.”]

[Arbitrary  $\gg$  i; p  $\xrightarrow{\text{tex}}$  “  
\newline \makebox [0.1\textwidth ][l]{  
\if \relax \cname lgwproofline\endcname L\_? \else  
\global \advance \lgwproofline by 1  
L\ifnum \lgwproofline <10 0\fi \number \lgwproofline  
\fi  
\$:}\makebox [0.4\textwidth ][l]{\\$Arbitrary}\gg}\\$}\quad  
\parbox [t]{0.4\textwidth }{\\$#1.  
\$\hfill \makebox [0mm][l]{\quad ;}}#2.”]

[Arbitrary  $\gg$  i; p  $\xrightarrow{\text{name}}$  “  
Arbitrary \gg #1.  
; #2.”]

[x\y  $\xrightarrow{\text{tex}}$  “#1.  
\{\}#2.”]

[x\y  $\xrightarrow{\text{name}}$  “#1.  
\backslash \backslash #2.”]

[A  $\xrightarrow{\text{tex}}$  “  
A”]

[R  $\xrightarrow{\text{tex}}$  “  
R”]

[C  $\xrightarrow{\text{tex}}$  “  
C”]

[T  $\xrightarrow{\text{tex}}$  “  
T”]

[L  $\xrightarrow{\text{tex}}$  “  
L”]

[{x}  $\xrightarrow{\text{tex}}$  “  
\{#1.  
\}”]

[S  $\xrightarrow{\text{tex}}$  “  
S”]

[Neg  $\xrightarrow{\text{tex}}$  “  
Neg”]

[S1  $\xrightarrow{\text{tex}}$  “  
S1”]

[S2  $\xrightarrow{\text{tex}}$  “  
S2”]

[S3  $\xrightarrow{\text{tex}}$  “  
S3”]

[S4  $\xrightarrow{\text{tex}}$  “  
S4”]

[S5  $\xrightarrow{\text{tex}}$  “  
S5”]

[S6  $\xrightarrow{\text{tex}}$  “  
S6”]

[S7  $\xrightarrow{\text{tex}}$  “  
S7”]

[S8  $\xrightarrow{\text{tex}}$  “  
S8”]

[S9  $\xrightarrow{\text{tex}}$  “  
S9”]

[S10  $\xrightarrow{\text{tex}}$  “  
S10”]

[MP  $\xrightarrow{\text{tex}}$  “  
MP”]

[Gen  $\xrightarrow{\text{tex}}$  “  
Gen”]

[Ded  $\xrightarrow{\text{tex}}$  “  
Ded”]

[Repetition  $\xrightarrow{\text{tex}}$  “  
Repetition”]

[A1'  $\xrightarrow{\text{tex}}$  “  
A1”]

[A2'  $\xrightarrow{\text{tex}}$  “  
A2”]

[A4'  $\xrightarrow{\text{tex}}$  “  
A4”]

[A5'  $\xrightarrow{\text{tex}}$  “  
A5”]

[x<sup>var</sup>  $\xrightarrow{\text{tex}}$  “#1.  
{ }<sup>{var}</sup>”]

[x#y  $\xrightarrow{\text{tex}}$  “#1.  
\#. #2.”]

[x#<sup>0</sup>y  $\xrightarrow{\text{tex}}$  “#1.  
\#. <sup>0</sup>#2.”]



[x#<sup>1</sup>y  $\xrightarrow{\text{tex}}$  “#1.  
 \#. ^1#2.”]

[x#\*y  $\xrightarrow{\text{tex}}$  “#1.  
 \#. ^\*#2.”]

[⟨x≡y|z:=u⟩  $\xrightarrow{\text{tex}}$  “  
 \langle #1.  
 {\equiv} #2.  
 | #3.  
 {:=} #4.  
 \rangle ”]

[⟨x≡<sup>0</sup>y|z:=u⟩  $\xrightarrow{\text{tex}}$  “  
 \langle #1.  
 {\equiv}^0 #2.  
 | #3.  
 {:=} #4.  
 \rangle ”]

[⟨x≡<sup>1</sup>y|z:=u⟩  $\xrightarrow{\text{tex}}$  “  
 \langle #1.  
 {\equiv}^1 #2.  
 | #3.  
 {:=} #4.  
 \rangle ”]

[⟨x≡\*y|z:=u⟩  $\xrightarrow{\text{tex}}$  “  
 \langle #1.  
 {\equiv}^\* #2.  
 | #3.  
 {:=} #4.  
 \rangle ”]

[Ded(x, y)  $\xrightarrow{\text{tex}}$  “  
 Ded(#1.  
 , #2.  
 )”]

[Ded<sub>0</sub>(x, y)  $\xrightarrow{\text{tex}}$  “  
 Ded\_0(#1.  
 , #2.  
 )”]

[Ded<sub>1</sub>(x, y, z)  $\xrightarrow{\text{tex}}$  “  
 Ded\_1(#1.  
 , #2.

, #3.  
)”]

[Ded<sub>2</sub>(x, y, z)  $\xrightarrow{\text{tex}}$  “  
Ded\_2(#1.  
, #2.  
, #3.  
)”]

[Ded<sub>3</sub>(x, y, z, u)  $\xrightarrow{\text{tex}}$  “  
Ded\_3(#1.  
, #2.  
, #3.  
, #4.  
)”]

[Ded<sub>4</sub>(x, y, z, u)  $\xrightarrow{\text{tex}}$  “  
Ded\_4(#1.  
, #2.  
, #3.  
, #4.  
)”]

[Ded<sub>4</sub><sup>\*</sup>(x, y, z, u)  $\xrightarrow{\text{tex}}$  “  
Ded\_4^\*(#1.  
, #2.  
, #3.  
, #4.  
)”]

[Ded<sub>5</sub>(x, y, z)  $\xrightarrow{\text{tex}}$  “  
Ded\_5(#1.  
, #2.  
, #3.  
)”]

[Ded<sub>6</sub>(p, c, e, b)  $\xrightarrow{\text{tex}}$  “  
Ded\_6(#1.  
, #2.  
, #3.  
, #4.  
)”]

[Ded<sub>6</sub><sup>\*</sup>(p, c, e, b)  $\xrightarrow{\text{tex}}$  “  
Ded\_6^\*(#1.  
, #2.  
, #3.  
)”]

, #4.  
)”]

[Ded<sub>7</sub>(p)  $\xrightarrow{\text{tex}}$  “  
Ded\_7(#1.  
)”]

[Ded<sub>8</sub>(p, b)  $\xrightarrow{\text{tex}}$  “  
Ded\_8(#1.  
, #2.  
)”]

[Ded<sub>8</sub><sup>\*</sup>(p, b)  $\xrightarrow{\text{tex}}$  “  
Ded\_8^\*(#1.  
, #2.  
)”]

[Begin b;l : End; p  $\xrightarrow{\text{tex}}$  “  
\newline \makebox [0.1\textwidth]{}%  
\parbox [b]{0.4\textwidth}{\raggedright  
\setlength {\parindent}{-0.1\textwidth}%  
\makebox [0.1\textwidth][l]{  
\if \relax \cname lgwproofline\endcsname L\_? \else  
\global \advance \lgwproofline by 1  
L\ifnum \lgwproofline <10 0\fi \number \lgwproofline  
\fi  
\$:\$Block {\}\gg {\}\$}\quad  
\parbox [t]{0.4\textwidth}{\$Begin  
\$\hfill \makebox [0mm][l]{\quad ; }#1.  
\newline \makebox [0.1\textwidth]{}%  
\parbox [b]{0.4\textwidth}{\raggedright  
\setlength {\parindent}{-0.1\textwidth}%  
\makebox [0.1\textwidth][l]{\$#2.  
\$:\$Block {\}\gg {\}\$}\quad  
\parbox [t]{0.4\textwidth}{\$End  
\$\hfill \makebox [0mm][l]{\quad ; }#3.”]

[Begin b;l : End; p  $\xrightarrow{\text{name}}$  “  
Begin \, #1.  
; #2.  
: End ; #3.”]

[Last block line a  $\gg i$ ;  $\xrightarrow{\text{tex}}$  “  
\newline \makebox [0.1\textwidth]{}%  
\parbox [b]{0.4\textwidth}{\raggedright  
\setlength {\parindent}{-0.1\textwidth}%  
\makebox [0.1\textwidth][l]{\$

```

\if \relax \cname lgwproofline\endcsname L_? \else
\global \advance \lgwproofline by 1
L\ifnum \lgwproofline <10 0\fi \number \lgwproofline
\fi
$:\}$#1.
{\}\gg {\}\$}\quad
\parbox [t]{0.4\textwidth }{\$#2.
$\hfill \makebox [0mm][l]{\quad ;}}

```

```

[Last block line a  $\gg$  i;  $\xrightarrow{\text{name}}$  “
Last\ block\ line \, #1.
\gg #2.
\, ;”]

```

```

[x  $\geq$  y  $\xrightarrow{\text{tex}}$  “#1.
\unrhd #2.”]

```

```

[x||y  $\xrightarrow{\text{tex}}$  “#1.
\| #2.”]

```

```

[Prop 3.2a  $\xrightarrow{\text{tex}}$  “
Prop\ 3.2a”]

```

```

[Prop 3.2b  $\xrightarrow{\text{tex}}$  “
Prop\ 3.2b”]

```

```

[Prop 3.2c  $\xrightarrow{\text{tex}}$  “
Prop\ 3.2c”]

```

```

[Prop 3.2d  $\xrightarrow{\text{tex}}$  “
Prop\ 3.2d”]

```

```

[Prop 3.2e1  $\xrightarrow{\text{tex}}$  “
Prop\ 3.2e.1”]

```

```

[Prop 3.2e2  $\xrightarrow{\text{tex}}$  “
Prop\ 3.2e.2”]

```

```

[Prop 3.2e  $\xrightarrow{\text{tex}}$  “
Prop\ 3.2e”]

```

```

[Prop 3.2f1  $\xrightarrow{\text{tex}}$  “
Prop\ 3.2f.1”]

```

```

[Prop 3.2f2  $\xrightarrow{\text{tex}}$  “
Prop\ 3.2f.2”]

```

[Prop 3.2f  $\xrightarrow{\text{tex}}$  “  
Prop\ 3.2f”]

[Prop 3.2g<sub>1</sub>  $\xrightarrow{\text{tex}}$  “  
Prop\ 3.2g\_1”]

[Prop 3.2g<sub>2</sub>  $\xrightarrow{\text{tex}}$  “  
Prop\ 3.2g\_2”]

[Prop 3.2g  $\xrightarrow{\text{tex}}$  “  
Prop\ 3.2g”]

[Prop 3.2h<sub>1</sub>  $\xrightarrow{\text{tex}}$  “  
Prop\ 3.2h\_1”]

[Prop 3.2h<sub>2</sub>  $\xrightarrow{\text{tex}}$  “  
Prop\ 3.2h\_2”]

[Prop 3.2h  $\xrightarrow{\text{tex}}$  “  
Prop\ 3.2h”]

[Prop 3.2i  $\xrightarrow{\text{tex}}$  “  
Prop\ 3.2i”]

[Prop 3.2j  $\xrightarrow{\text{tex}}$  “  
Prop\ 3.2j”]

[Prop 3.2j<sub>1</sub>  $\xrightarrow{\text{tex}}$  “  
Prop\ 3.2j\_1”]

[Prop 3.2j<sub>2</sub>  $\xrightarrow{\text{tex}}$  “  
Prop\ 3.2j\_2”]

[Prop 3.2k  $\xrightarrow{\text{tex}}$  “  
Prop\ 3.2k”]

[Prop 3.2k<sub>1</sub>  $\xrightarrow{\text{tex}}$  “  
Prop\ 3.2k\_1”]

[Prop 3.2k<sub>2</sub>  $\xrightarrow{\text{tex}}$  “  
Prop\ 3.2k\_2”]

[Prop 3.2l  $\xrightarrow{\text{tex}}$  “  
Prop\ 3.2l”]

[Prop 3.2l<sub>1</sub>  $\xrightarrow{\text{tex}}$  “  
Prop\ 3.2l\_1”]

[Prop 3.2l<sub>2</sub>  $\xrightarrow{\text{tex}}$  “  
Prop\ 3.2l\_2”]

[Prop 3.2m  $\xrightarrow{\text{tex}}$  “  
Prop\ 3.2m”]

[Prop 3.2m<sub>1</sub>  $\xrightarrow{\text{tex}}$  “  
Prop\ 3.2m\_1”]

[Prop 3.2m<sub>2</sub>  $\xrightarrow{\text{tex}}$  “  
Prop\ 3.2m\_2”]

[Prop 3.2n  $\xrightarrow{\text{tex}}$  “  
Prop\ 3.2n”]

[Prop 3.2n<sub>1</sub>  $\xrightarrow{\text{tex}}$  “  
Prop\ 3.2n\_1”]

[Prop 3.2n<sub>2</sub>  $\xrightarrow{\text{tex}}$  “  
Prop\ 3.2n\_2”]

[Prop 3.2o  $\xrightarrow{\text{tex}}$  “  
Prop\ 3.2o”]

[Prop 3.4a<sub>1</sub>  $\xrightarrow{\text{tex}}$  “  
Prop\ 3.4a\_1”]

[Prop 3.4a<sub>2</sub>  $\xrightarrow{\text{tex}}$  “  
Prop\ 3.4a\_2”]

[Prop 3.4a  $\xrightarrow{\text{tex}}$  “  
Prop\ 3.4a”]

[Prop 3.4b  $\xrightarrow{\text{tex}}$  “  
Prop\ 3.4b”]

[Prop 3.4c<sub>1</sub>  $\xrightarrow{\text{tex}}$  “  
Prop\ 3.4c\_1”]

[Prop 3.4c<sub>2</sub>  $\xrightarrow{\text{tex}}$  “  
Prop\ 3.4c\_2”]

[Prop 3.4c  $\xrightarrow{\text{tex}}$  “  
Prop\ 3.4c”]

[Prop 3.4d<sub>1</sub>  $\xrightarrow{\text{tex}}$  “  
Prop\ 3.4d\_1”]

[Prop 3.4d<sub>2</sub>  $\xrightarrow{\text{tex}}$  “  
Prop\ 3.4d\_2”]

[Prop 3.4d  $\xrightarrow{\text{tex}}$  “  
Prop\ 3.4d”]

[MacroIndent(x)  $\xrightarrow{\text{tex}}$  “  
\$%  
\leftskip=1em%  
\$#1.”]

[MacroIndent(x)  $\xrightarrow{\text{name}}$  “  
MacroIndent(#1.  
)”]

[Block<sub>1</sub>(t, s, c)  $\xrightarrow{\text{tex}}$  “  
Block\_1(#1.  
, #2.  
, #3.  
)”]

[Block<sub>2</sub>(b)  $\xrightarrow{\text{tex}}$  “  
Block\_2(#1.  
)”]

[ $\xrightarrow{\text{tex}}$  “  
\rightarrow ”]

### 3.1 Variables

[ $\bar{x}$   $\xrightarrow{\text{tex}}$  “\overline{#1.}”]  
[ $a$   $\xrightarrow{\text{macro}}$   $\lambda t. \lambda s. \lambda c. \tilde{\mathcal{M}}_4(t, s, c, [[a \doteq \bar{a}]])$ ]  
[ $b$   $\xrightarrow{\text{macro}}$   $\lambda t. \lambda s. \lambda c. \tilde{\mathcal{M}}_4(t, s, c, [[b \doteq \bar{b}]])$ ]  
[ $c$   $\xrightarrow{\text{macro}}$   $\lambda t. \lambda s. \lambda c. \tilde{\mathcal{M}}_4(t, s, c, [[c \doteq \bar{c}]])$ ]  
[ $d$   $\xrightarrow{\text{macro}}$   $\lambda t. \lambda s. \lambda c. \tilde{\mathcal{M}}_4(t, s, c, [[d \doteq \bar{d}]])$ ]  
[ $e$   $\xrightarrow{\text{macro}}$   $\lambda t. \lambda s. \lambda c. \tilde{\mathcal{M}}_4(t, s, c, [[e \doteq \bar{e}]])$ ]  
[ $f$   $\xrightarrow{\text{macro}}$   $\lambda t. \lambda s. \lambda c. \tilde{\mathcal{M}}_4(t, s, c, [[f \doteq \bar{f}]])$ ]  
[ $g$   $\xrightarrow{\text{macro}}$   $\lambda t. \lambda s. \lambda c. \tilde{\mathcal{M}}_4(t, s, c, [[g \doteq \bar{g}]])$ ]  
[ $h$   $\xrightarrow{\text{macro}}$   $\lambda t. \lambda s. \lambda c. \tilde{\mathcal{M}}_4(t, s, c, [[h \doteq \bar{h}]])$ ]  
[ $i$   $\xrightarrow{\text{macro}}$   $\lambda t. \lambda s. \lambda c. \tilde{\mathcal{M}}_4(t, s, c, [[i \doteq \bar{i}]])$ ]  
[ $j$   $\xrightarrow{\text{macro}}$   $\lambda t. \lambda s. \lambda c. \tilde{\mathcal{M}}_4(t, s, c, [[j \doteq \bar{j}]])$ ]  
[ $k$   $\xrightarrow{\text{macro}}$   $\lambda t. \lambda s. \lambda c. \tilde{\mathcal{M}}_4(t, s, c, [[k \doteq \bar{k}]])$ ]  
[ $l$   $\xrightarrow{\text{macro}}$   $\lambda t. \lambda s. \lambda c. \tilde{\mathcal{M}}_4(t, s, c, [[l \doteq \bar{l}]])$ ]  
[ $m$   $\xrightarrow{\text{macro}}$   $\lambda t. \lambda s. \lambda c. \tilde{\mathcal{M}}_4(t, s, c, [[m \doteq \bar{m}]])$ ]  
[ $n$   $\xrightarrow{\text{macro}}$   $\lambda t. \lambda s. \lambda c. \tilde{\mathcal{M}}_4(t, s, c, [[n \doteq \bar{n}]])$ ]

$[o \xrightarrow{\text{macro}} \lambda t. \lambda s. \lambda c. \tilde{\mathcal{M}}_4(t, s, c, [[o \doteq \bar{o}]])]$   
 $[p \xrightarrow{\text{macro}} \lambda t. \lambda s. \lambda c. \tilde{\mathcal{M}}_4(t, s, c, [[p \doteq \bar{p}]])]$   
 $[q \xrightarrow{\text{macro}} \lambda t. \lambda s. \lambda c. \tilde{\mathcal{M}}_4(t, s, c, [[q \doteq \bar{q}]])]$   
 $[r \xrightarrow{\text{macro}} \lambda t. \lambda s. \lambda c. \tilde{\mathcal{M}}_4(t, s, c, [[r \doteq \bar{r}]])]$   
 $[s \xrightarrow{\text{macro}} \lambda t. \lambda s. \lambda c. \tilde{\mathcal{M}}_4(t, s, c, [[s \doteq \bar{s}]])]$   
 $[t \xrightarrow{\text{macro}} \lambda t. \lambda s. \lambda c. \tilde{\mathcal{M}}_4(t, s, c, [[t \doteq \bar{t}]])]$   
 $[u \xrightarrow{\text{macro}} \lambda t. \lambda s. \lambda c. \tilde{\mathcal{M}}_4(t, s, c, [[u \doteq \bar{u}]])]$   
 $[v \xrightarrow{\text{macro}} \lambda t. \lambda s. \lambda c. \tilde{\mathcal{M}}_4(t, s, c, [[v \doteq \bar{v}]])]$   
 $[w \xrightarrow{\text{macro}} \lambda t. \lambda s. \lambda c. \tilde{\mathcal{M}}_4(t, s, c, [[w \doteq \bar{w}]])]$   
 $[x \xrightarrow{\text{macro}} \lambda t. \lambda s. \lambda c. \tilde{\mathcal{M}}_4(t, s, c, [[x \doteq \bar{x}]])]$   
 $[y \xrightarrow{\text{macro}} \lambda t. \lambda s. \lambda c. \tilde{\mathcal{M}}_4(t, s, c, [[y \doteq \bar{y}]])]$   
 $[z \xrightarrow{\text{macro}} \lambda t. \lambda s. \lambda c. \tilde{\mathcal{M}}_4(t, s, c, [[z \doteq \bar{z}]])]$   
 $[a \xrightarrow{\text{tex}} \text{“} \backslash \text{mathit}\{a\} \text{”}]$   
 $[b \xrightarrow{\text{tex}} \text{“} \backslash \text{mathit}\{b\} \text{”}]$   
 $[c \xrightarrow{\text{tex}} \text{“} \backslash \text{mathit}\{c\} \text{”}]$   
 $[d \xrightarrow{\text{tex}} \text{“} \backslash \text{mathit}\{d\} \text{”}]$   
 $[e \xrightarrow{\text{tex}} \text{“} \backslash \text{mathit}\{e\} \text{”}]$   
 $[f \xrightarrow{\text{tex}} \text{“} \backslash \text{mathit}\{f\} \text{”}]$   
 $[g \xrightarrow{\text{tex}} \text{“} \backslash \text{mathit}\{g\} \text{”}]$   
 $[h \xrightarrow{\text{tex}} \text{“} \backslash \text{mathit}\{h\} \text{”}]$   
 $[i \xrightarrow{\text{tex}} \text{“} \backslash \text{mathit}\{i\} \text{”}]$   
 $[j \xrightarrow{\text{tex}} \text{“} \backslash \text{mathit}\{j\} \text{”}]$   
 $[k \xrightarrow{\text{tex}} \text{“} \backslash \text{mathit}\{k\} \text{”}]$   
 $[l \xrightarrow{\text{tex}} \text{“} \backslash \text{mathit}\{l\} \text{”}]$   
 $[m \xrightarrow{\text{tex}} \text{“} \backslash \text{mathit}\{m\} \text{”}]$   
 $[n \xrightarrow{\text{tex}} \text{“} \backslash \text{mathit}\{n\} \text{”}]$



$[o \xrightarrow{\text{tex}} \text{“} \backslash\mathit{o}\text{”}]$   
 $[p \xrightarrow{\text{tex}} \text{“} \backslash\mathit{p}\text{”}]$   
 $[q \xrightarrow{\text{tex}} \text{“} \backslash\mathit{q}\text{”}]$   
 $[r \xrightarrow{\text{tex}} \text{“} \backslash\mathit{r}\text{”}]$   
 $[s \xrightarrow{\text{tex}} \text{“} \backslash\mathit{s}\text{”}]$   
 $[t \xrightarrow{\text{tex}} \text{“} \backslash\mathit{t}\text{”}]$   
 $[u \xrightarrow{\text{tex}} \text{“} \backslash\mathit{u}\text{”}]$   
 $[v \xrightarrow{\text{tex}} \text{“} \backslash\mathit{v}\text{”}]$   
 $[w \xrightarrow{\text{tex}} \text{“} \backslash\mathit{w}\text{”}]$   
 $[x \xrightarrow{\text{tex}} \text{“} \backslash\mathit{x}\text{”}]$   
 $[y \xrightarrow{\text{tex}} \text{“} \backslash\mathit{y}\text{”}]$   
 $[z \xrightarrow{\text{tex}} \text{“} \backslash\mathit{z}\text{”}]$

## 4 Priority table

$[\text{opgave} \xrightarrow{\text{prio}}$

### Preassociative

$[\text{opgave}]$ ,  $[\text{base}]$ ,  $[\text{bracket } * \text{ end bracket}]$ ,  $[\text{big bracket } * \text{ end bracket}]$ ,  $[\$ * \$]$ ,  
 $[\text{flush left } [*]]$ ,  $[x]$ ,  $[y]$ ,  $[z]$ ,  $[[* \bowtie *]]$ ,  $[[* \xrightarrow{*} *]]$ ,  $[\text{pyk}]$ ,  $[\text{tex}]$ ,  $[\text{name}]$ ,  $[\text{prio}]$ ,  $[*]$ ,  $[\text{T}]$ ,  
 $[\text{if}(*, *, *)]$ ,  $[[* \xrightarrow{*} *]]$ ,  $[\text{val}]$ ,  $[\text{claim}]$ ,  $[\perp]$ ,  $[\text{f}(*)]$ ,  $[(*)^I]$ ,  $[\text{F}]$ ,  $[0]$ ,  $[1]$ ,  $[2]$ ,  $[3]$ ,  $[4]$ ,  $[5]$ ,  $[6]$ ,  
 $[7]$ ,  $[8]$ ,  $[9]$ ,  $[0]$ ,  $[1]$ ,  $[2]$ ,  $[3]$ ,  $[4]$ ,  $[5]$ ,  $[6]$ ,  $[7]$ ,  $[8]$ ,  $[9]$ ,  $[a]$ ,  $[b]$ ,  $[c]$ ,  $[d]$ ,  $[e]$ ,  $[f]$ ,  $[g]$ ,  $[h]$ ,  $[i]$ ,  $[j]$ ,  
 $[k]$ ,  $[l]$ ,  $[m]$ ,  $[n]$ ,  $[o]$ ,  $[p]$ ,  $[q]$ ,  $[r]$ ,  $[s]$ ,  $[t]$ ,  $[u]$ ,  $[v]$ ,  $[w]$ ,  $[(*)^M]$ ,  $[\text{If}(*, *, *)]$ ,  
 $[\text{array}\{*\} * \text{end array}]$ ,  $[l]$ ,  $[c]$ ,  $[r]$ ,  $[\text{empty}]$ ,  $[( * | * := * )]$ ,  $[\mathcal{M}(*)]$ ,  $[\tilde{\mathcal{U}}(*)]$ ,  $[\mathcal{U}(*)]$ ,  
 $[\mathcal{U}^M(*)]$ ,  $[\mathbf{apply}(*, *)]$ ,  $[\mathbf{apply}_1(*, *)]$ ,  $[\text{identifier}(*)]$ ,  $[\text{identifier}_1(*, *)]$ ,  $[\text{array-}$   
 $\text{plus}(*, *)]$ ,  $[\text{array-remove}(*, *, *)]$ ,  $[\text{array-put}(*, *, *, *)]$ ,  $[\text{array-add}(*, *, *, *, *)]$ ,  
 $[\text{bit}(*, *)]$ ,  $[\text{bit}_1(*, *)]$ ,  $[\text{rack}]$ ,  $["\text{vector}"]$ ,  $["\text{bibliography}"]$ ,  $["\text{dictionary}"]$ ,  
 $["\text{body}"]$ ,  $["\text{codex}"]$ ,  $["\text{expansion}"]$ ,  $["\text{code}"]$ ,  $["\text{cache}"]$ ,  $["\text{diagnose}"]$ ,  $["\text{pyk}"]$ ,  
 $["\text{tex}"]$ ,  $["\text{texname}"]$ ,  $["\text{value}"]$ ,  $["\text{message}"]$ ,  $["\text{macro}"]$ ,  $["\text{definition}"]$ ,  
 $["\text{unpack}"]$ ,  $["\text{claim}"]$ ,  $["\text{priority}"]$ ,  $["\text{lambda}"]$ ,  $["\text{apply}"]$ ,  $["\text{true}"]$ ,  $["\text{if}"]$ ,  
 $["\text{quote}"]$ ,  $["\text{proclaim}"]$ ,  $["\text{define}"]$ ,  $["\text{introduce}"]$ ,  $["\text{hide}"]$ ,  $["\text{pre}"]$ ,  $["\text{post}"]$ ,



[Prop 3.2k], [Prop 3.2l<sub>1</sub>], [Prop 3.2l<sub>2</sub>], [Prop 3.2l], [Prop 3.2m<sub>1</sub>], [Prop 3.2m<sub>2</sub>],  
 [Prop 3.2m], [Prop 3.2n<sub>1</sub>], [Prop 3.2n<sub>2</sub>], [Prop 3.2n], [Prop 3.2o], [Prop 3.4a<sub>1</sub>],  
 [Prop 3.4a<sub>2</sub>], [Prop 3.4a], [Prop 3.4b], [Prop 3.4c<sub>1</sub>], [Prop 3.4c<sub>2</sub>], [Prop 3.4c],  
 [Prop 3.4d<sub>1</sub>], [Prop 3.4d<sub>2</sub>], [Prop 3.4d], [Block<sub>1</sub>(\* , \* , \*)], [Block<sub>2</sub>(\* )];

**Preassociative**

[\*\_{\*}], [\* /indexintro(\* , \* , \* , \*)], [\* /intro(\* , \* , \*)], [\* /bothintro(\* , \* , \* , \* , \*)],  
 [\* /nameintro(\* , \* , \* , \*)], [\* /], [\* [\* ]], [\* [\* → \* ]], [\* [\* ⇒ \* ]], [\* 0], [\* 1], [0b], [\* -color(\* )],  
 [\* -color\* (\* )], [\* <sup>H</sup>], [\* <sup>T</sup>], [\* <sup>U</sup>], [\* <sup>h</sup>], [\* <sup>t</sup>], [\* <sup>s</sup>], [\* <sup>c</sup>], [\* <sup>d</sup>], [\* <sup>a</sup>], [\* <sup>C</sup>], [\* <sup>M</sup>], [\* <sup>B</sup>], [\* <sup>r</sup>], [\* <sup>i</sup>],  
 [\* <sup>d</sup>], [\* <sup>R</sup>], [\* 0], [\* 1], [\* 2], [\* 3], [\* 4], [\* 5], [\* 6], [\* 7], [\* 8], [\* 9], [\* <sup>E</sup>], [\* <sup>v</sup>], [\* <sup>C</sup>], [\* <sup>C\*</sup>],  
 [\* <sub>hide</sub>];

**Preassociative**

[“ \* ”], [], [(\*)<sup>t</sup>], [string(\*) + \*], [string(\*) ++ \*], [  
 \*], [\*], [! \*], [\" \*], [# \*], [\$ \*], [% \*], [& \*], [\*], [(\*)], [() \*], [\*\*], [+ \*], [, \*], [- \*], [.\*], [/ \*],  
 [0 \*], [1 \*], [2 \*], [3 \*], [4 \*], [5 \*], [6 \*], [7 \*], [8 \*], [9 \*], [: \*], [; \*], [< \*], [= \*], [> \*], [? \*],  
 [@ \*], [A \*], [B \*], [C \*], [D \*], [E \*], [F \*], [G \*], [H \*], [I \*], [J \*], [K \*], [L \*], [M \*], [N \*],  
 [O \*], [P \*], [Q \*], [R \*], [S \*], [T \*], [U \*], [V \*], [W \*], [X \*], [Y \*], [Z \*], [[\*], [\\ \*], [ ] \*], [^ \*],  
 [\_\*], [^ \*], [a \*], [b \*], [c \*], [d \*], [e \*], [f \*], [g \*], [h \*], [i \*], [j \*], [k \*], [l \*], [m \*], [n \*], [o \*],  
 [p \*], [q \*], [r \*], [s \*], [t \*], [u \*], [v \*], [w \*], [x \*], [y \*], [z \*], [{ \*}, [ | \*}, [ } \*}, [ ~ \*},  
 [Preassociative \* ; \*], [Postassociative \* ; \*], [[\*], [\*], [priority \* end],  
 [newline \*], [macro newline \*], [MacroIndent(\* )];

**Preassociative**

[\* ' \*], [\* ' \*];

**Preassociative**

[\* /];

**Preassociative**

[\* · \*], [\* · 0 \*];

**Preassociative**

[\* + \*], [\* + 0 \*], [\* + 1 \*], [\* - \*], [\* - 0 \*], [\* - 1 \*];

**Preassociative**

[\* ∪ { \* }], [\* ∪ \*], [\* \ { \* }];

**Postassociative**

[\* . . \*], [\* . : \*], [\* : : \*], [\* + 2 \* \*], [\* : : \*], [\* + 2 \* \*];

**Postassociative**

[\* , \*];

**Preassociative**

[\* <sub>B</sub> ≈ \*], [\* <sub>D</sub> ≈ \*], [\* <sub>C</sub> ≈ \*], [\* <sub>P</sub> ≈ \*], [\* ≈ \*], [\* = \*], [\* → \*], [\* = \*], [\* = \*], [\* = \*], [\* = \*],  
 [\* ∈<sub>T</sub> \*], [\* ⊆<sub>T</sub> \*], [\* <sub>T</sub> \*], [\* <sub>S</sub> \*], [\* free in \*], [\* free in\* \*], [\* free for \* in \*],  
 [\* free for\* \* in \*], [\* ∈<sub>C</sub> \*], [\* < \*], [\* <' \*], [\* ≤' \*], [\* = \*], [\* ≠ \*], [\* <sup>var</sup>],  
 [\* # 0 \*], [\* # 1 \*], [\* # \* \*];

**Preassociative**

[¬ \*];

**Preassociative**

[\* ∧ \*], [\* ∨ \*], [\* ∼ \*], [\* ∧<sub>C</sub> \*];

**Preassociative**

[\* ∨ \*], [\* || \*], [\* ∨̇ \*];

**Preassociative**

$[\exists *: *], [\forall *: *], [\forall_{\text{obj}} *: *];$

**Postassociative**

$[* \Rightarrow *], [* \Rightarrow *], [* \Leftrightarrow *];$

**Postassociative**

$[* : *], [* \text{ spy } *], [*! *];$

**Preassociative**

$[* \left\{ \begin{array}{l} * \\ * \end{array} \right.];$

**Preassociative**

$[\lambda * . *], [\Lambda * . *], [\Lambda *], [\text{if } * \text{ then } * \text{ else } *], [\text{let } * = * \text{ in } *], [\text{let } * \doteq * \text{ in } *];$

**Preassociative**

$[* \# *];$

**Preassociative**

$[* \uparrow], [* \triangleright], [* \vee], [* +], [* -], [* *];$

**Preassociative**

$[* @ *], [* \triangleright *], [* \blacktriangleright *], [* \gg *], [* \triangleleft *];$

**Postassociative**

$[* \vdash *], [* \Vdash *], [* \text{ i.e. } *];$

**Preassociative**

$[\forall *: *], [\Pi *: *];$

**Postassociative**

$[* \oplus *];$

**Postassociative**

$[* ; *];$

**Preassociative**

$[* \text{ proves } *];$

**Preassociative**

$[* \text{ proof of } * : *], [\text{Line } * : * \gg * ; *], [\text{Last line } * \gg * \square],$   
 $[\text{Line } * : \text{Premise } \gg * ; *], [\text{Line } * : \text{Side-condition } \gg * ; *], [\text{Arbitrary } \gg * ; *],$   
 $[\text{Local } \gg * = * ; *], [\text{Begin } * ; * : \text{End}; *], [\text{Last block line } * \gg * ; ],$   
 $[\text{Arbitrary } \gg * ; *];$

**Postassociative**

$[* | *];$

**Postassociative**

$[* , *], [* [ * ] *];$

**Preassociative**

$[* \& *], [\rightarrow];$

**Preassociative**

$[* \\ *], [* \text{ linebreak}[4] *], [* \\ *], [* || *];]$