(*** MAKROER BEGYNDER ***)

$[\mathrm{ph}_1 \doteqdot \mathsf{a}_{\mathrm{Ph}}]$
$[\mathrm{ph}_2 \doteqdot \mathsf{b}_{\mathrm{Ph}}]$
$[\mathrm{ph}_3 \doteqdot \mathsf{c}_{\mathrm{Ph}}]$
$[\mathrm{ph}_4 \doteqdot \mathsf{d}_{\mathrm{Ph}}]$
$[\mathrm{ph}_5 \doteqdot \mathsf{e}_{\mathrm{Ph}}]$
$[\mathrm{ph}_6 \doteqdot \mathsf{f}_{\mathrm{Ph}}]$
$[\mathsf{x} \mathbin{\dot\wedge} \mathsf{y} \doteqdot \dot\neg\,((\mathsf{x} \Rightarrow \dot\neg\,(\mathsf{y})\mathrm{n}))\mathrm{n}]$
$[\mathsf{x} \mathbin{\dot\vee} \mathsf{y} \doteqdot \dot\neg\,(\mathsf{x})\mathrm{n} \Rightarrow \mathsf{y}]$
$[\mathsf{x} \mathbin{\dot\Leftrightarrow} \mathsf{y} \doteqdot (\mathsf{x} \Rightarrow \mathsf{y}) \mathbin{\dot\wedge} (\mathsf{y} \Rightarrow \mathsf{x})]$
$[\mathsf{x} \neq \mathsf{y} \doteqdot \dot\neg\,(\mathsf{x} {=}{=} \mathsf{y})\mathrm{n}]$
$[\mathsf{x} \notin \mathsf{y} \doteqdot \dot\neg\,(\mathsf{x} \in \mathsf{y})\mathrm{n}]$
$[\mathsf{x} \subseteq \mathsf{y} \doteqdot \forall(\mathrm{S1ob})\colon((\mathrm{S1ob}) \in \mathsf{x} \Rightarrow (\mathrm{S1ob}) \in \mathsf{y})]$
$[\{\mathsf{x}\} \doteqdot \{\mathsf{x}, \mathsf{x}\}]$
$[\mathsf{x} \cup \mathsf{y} \doteqdot \cup\{\{\mathsf{x}\}, \{\mathsf{y}\}\}]$
$[\mathsf{x} \cap \mathsf{y} \doteqdot \{\mathrm{ph} \in \mathsf{x} \cup \mathsf{y} \mid \mathrm{ph}_3 \in \mathsf{x} \mathbin{\dot\wedge} \mathrm{ph}_3 \in \mathsf{y}\}]$
$[\langle \mathsf{x}, \mathsf{y}\rangle \doteqdot \{\{\mathsf{x}\}, \{\mathsf{x}, \mathsf{y}\}\}]$
$[\mathsf{r}(\mathsf{x}, \mathsf{y}) \doteqdot \langle \mathsf{x}, \mathsf{y}\rangle \in \mathsf{r}]$
$[\mathrm{ReflRel}(\mathsf{r}, \mathsf{x}) \doteqdot \forall s\colon(s \in \mathsf{x} \Rightarrow \mathsf{r}(s, s))]$
$[\mathrm{SymRel}(\mathsf{r}, \mathsf{x}) \doteqdot \forall s, t\colon(s \in \mathsf{x} \Rightarrow t \in \mathsf{x} \Rightarrow \mathsf{r}(s, t) \Rightarrow \mathsf{r}(t, s))]$
$[\mathrm{TransRel}(\mathsf{r}, \mathsf{x}) \doteqdot$
$\forall s, t, u\colon(s \in \mathsf{x} \Rightarrow t \in \mathsf{x} \Rightarrow u \in \mathsf{x} \Rightarrow \mathsf{r}(s, t) \Rightarrow \mathsf{r}(t, u) \Rightarrow \mathsf{r}(s, u))]$

$[\mathrm{EqRel}(\mathsf{r}, \mathsf{x}) \doteqdot \mathrm{ReflRel}(\mathsf{r}, \mathsf{x}) \mathbin{\dot\wedge} \mathrm{SymRel}(\mathsf{r}, \mathsf{x}) \mathbin{\dot\wedge} \mathrm{TransRel}(\mathsf{r}, \mathsf{x})]$

$[\mathcal{BS} \doteqdot \underline{\mathsf{bs}}]$
$[\mathsf{OBS} \doteqdot \overline{\mathsf{bs}}]$
$[[\mathsf{x} \in \mathsf{bs}]_{\mathsf{r}} \doteqdot \{\mathrm{ph} \in \mathsf{bs} \mid \mathsf{r}(\mathrm{ph}_1, \mathsf{x})\}]$

$[\mathsf{bs}/\mathsf{r} \doteqdot \{\mathrm{ph} \in \mathrm{P}(\mathsf{bs}) \mid \mathrm{Ex}_{20} \in \mathsf{bs} \mathbin{\dot\wedge} [\mathrm{Ex}_{20} \in \mathsf{bs}]_{\mathsf{r}} {=}{=} \mathrm{ph}_2\}]$

$[\mathrm{Partition}(\mathsf{p}, \mathsf{bs}) \doteqdot (\forall s\colon(s \in \mathsf{p} \Rightarrow s \neq \emptyset)) \mathbin{\dot\wedge}$
$(\forall s, t\colon(s \in \mathsf{p} \Rightarrow t \in \mathsf{p} \Rightarrow s \neq t \Rightarrow s \cap t {=}{=} \emptyset)) \mathbin{\dot\wedge}$
$\cup\, \mathsf{p} {=}{=} \mathsf{bs}]$

(*** EKSISTENS-VARIABLE ***)

$[\mathsf{x}^{\mathrm{Ex}} \doteq \mathsf{x} \overset{\mathrm{r}}{=} \lceil \mathsf{x}_{\mathrm{Ex}} \rceil]$

$[\mathrm{Ex}_1 \doteqdot \mathsf{a}_{\mathrm{Ex}}]$

$[\mathrm{Ex}_2 \doteqdot \mathsf{b}_{\mathrm{Ex}}]$
$[\mathrm{Ex}_{10} \doteqdot \mathsf{j}_{\mathrm{Ex}}]$
$[\mathrm{Ex}_{20} \doteqdot \mathsf{t}_{\mathrm{Ex}}]$
$[\langle \mathsf{a} {\equiv} \mathsf{b} | \mathsf{x}{:}{=}{=}\mathsf{t}\rangle_{\mathrm{Ex}} \doteqdot \langle \lceil \mathsf{a} \rceil {\equiv}^0 \lceil \mathsf{b} \rceil | \lceil \mathsf{x} \rceil{:}{=}{=}\lceil \mathsf{t} \rceil\rangle_{\mathrm{Ex}}]$

$[\langle \mathsf{a} {\equiv}^0 \mathsf{b} | \mathsf{x}{:}{=}{=}\mathsf{t}\rangle_{\mathrm{Ex}} \doteq \lambda \mathsf{c}.\mathsf{x}^{\mathrm{Ex}} \wedge \langle \mathsf{a} {\equiv}^1 \mathsf{b} | \mathsf{x}{:}{=}{=}\mathsf{t}\rangle_{\mathrm{Ex}}]$

$[\langle \mathsf{a}\equiv^1\mathsf{b}|\mathsf{x}{:}{=}{=}\mathsf{t}\rangle_{\mathrm{Ex}} \doteq \mathsf{a!x!t!}$
if $\mathsf{b} \stackrel{\mathrm{r}}{=} \lceil\forall \mathsf{u}{:}\, \mathsf{v}\rceil$ **then** F **else**
if $\mathsf{b}^{\mathrm{Ex}} \wedge \mathsf{b} \stackrel{\mathrm{t}}{=} \mathsf{x}$ **then** $\mathsf{a} \stackrel{\mathrm{t}}{=} \mathsf{t}$ **else**
$\mathsf{a} \stackrel{\mathrm{r}}{=} \mathsf{b} \ddot{\wedge} \langle \mathsf{a}^{\mathrm{t}}\equiv^*\mathsf{b}^{\mathrm{t}}|\mathsf{x}{:}{=}{=}\mathsf{t}\rangle_{\mathrm{Ex}}]$

$[\langle \mathsf{a}\equiv^*\mathsf{b}|\mathsf{x}{:}{=}{=}\mathsf{t}\rangle_{\mathrm{Ex}} \doteq \mathsf{b!x!t!}\mathrm{If}(\mathsf{a}, \mathsf{T}, \langle \mathsf{a}^{\mathrm{h}}\equiv^1\mathsf{b}^{\mathrm{h}}|\mathsf{x}{:}{=}{=}\mathsf{t}\rangle_{\mathrm{Ex}} \ddot{\wedge} \langle \mathsf{a}^{\mathrm{t}}\equiv^*\mathsf{b}^{\mathrm{t}}|\mathsf{x}{:}{=}{=}\mathsf{t}\rangle_{\mathrm{Ex}})]$

(*** AKSIOMATISK SYSTEM ***)
[**Theory** SystemQ]

[SystemQ **rule** MP: $\Pi\mathcal{A},\mathcal{B}{:}\, \mathcal{A} \Rightarrow \mathcal{B} \vdash \mathcal{A} \vdash \mathcal{B}$]

[SystemQ **rule** Gen: $\Pi\mathcal{X},\mathcal{A}{:}\, \mathcal{A} \vdash \forall\mathcal{X}{:}\, \mathcal{A}$]

[SystemQ **rule** Repetition: $\Pi\mathcal{A}{:}\, \mathcal{A} \vdash \mathcal{A}$]

[SystemQ **rule** Neg: $\Pi\mathcal{A},\mathcal{B}{:}\, \dot{\neg}\,(\mathcal{B})\mathrm{n} \Rightarrow \mathcal{A} \vdash \dot{\neg}\,(\mathcal{B})\mathrm{n} \Rightarrow \dot{\neg}\,(\mathcal{A})\mathrm{n} \vdash \mathcal{B}$]

[SystemQ **rule** Ded: $\Pi\mathcal{A},\mathcal{B}{:}\, \mathcal{A} \vdash \mathcal{B}$]

[SystemQ **rule** ExistIntro: $\Pi\mathcal{X},\mathcal{T},\mathcal{A},\mathcal{B}{:}\, \langle\mathcal{A}\equiv\mathcal{B}|\mathcal{X}{:}{=}{=}\mathcal{T}\rangle_{\mathrm{Ex}} \Vdash \mathcal{A} \vdash \mathcal{B}$]

[SystemQ **rule** Extensionality: $\Pi\mathcal{X},\mathcal{Y}{:}\, \mathcal{X}{=}{=}\mathcal{Y} \dot{\Leftrightarrow} \forall s{:}\, (s \in \mathcal{X} \dot{\Leftrightarrow} s \in \mathcal{Y})$]

[SystemQ **rule** Ødef: $\Pi\mathcal{S}{:}\, \dot{\neg}\,(\mathcal{S} \in \emptyset)\mathrm{n}$]

[SystemQ **rule** PairDef: $\Pi\mathcal{S},\mathcal{X},\mathcal{Y}{:}\, \mathcal{S} \in \{\mathcal{X},\mathcal{Y}\} \dot{\Leftrightarrow} \mathcal{S}{=}{=}\mathcal{X} \dot{\vee} \mathcal{S}{=}{=}\mathcal{Y}$]

[SystemQ **rule** UnionDef: $\Pi\mathcal{S},\mathcal{X}{:}\, \mathcal{S} \in \cup\mathcal{X} \dot{\Leftrightarrow} (\mathcal{S} \in \mathrm{Ex}_{10} \dot{\wedge} \mathrm{Ex}_{10} \in \mathcal{X})$]

[SystemQ **rule** PowerDef: $\Pi\mathcal{S},\mathcal{X}{:}\, \mathcal{S} \in \mathrm{P}(\mathcal{X}) \dot{\Leftrightarrow} \forall s{:}\, (s \in \mathcal{S} \Rightarrow s \in \mathcal{X})$]

[SystemQ **rule** SeparationDef: $\Pi\mathcal{A},\mathcal{B},\mathcal{P},\mathcal{X},\mathcal{Z}{:}\, \mathcal{P}^{\mathrm{Ph}} \wedge \langle\mathcal{B}\equiv\mathcal{A}|\mathcal{P}{:}{=}{=}\mathcal{Z}\rangle_{\mathrm{Ph}} \Vdash \mathcal{Z} \in \{\mathrm{ph} \in \mathcal{X} \mid \mathcal{A}\} \dot{\Leftrightarrow} \mathcal{Z} \in \mathcal{X} \dot{\wedge} \mathcal{B}$]

————- RRRRRRRRRRRRRR ————-
(*** import fra A.M. ***)
[SystemQ **rule** TimesCommutativity(R): $\Pi\mathrm{FX},\mathrm{FY}{:}\, \mathrm{R}(\mathrm{FX}){*}{*}\mathrm{R}(\mathrm{FY}) == \mathrm{R}(\mathrm{FY}) * \mathrm{R}(\mathrm{FX})$]
(*** aksiomer ***)
[SystemQ **rule** leqReflexivity: $\Pi\mathcal{X}{:}\, \mathcal{X} <= \mathcal{X}$]
[SystemQ **rule** leqAntisymmetryAxiom: $\Pi\mathcal{X},\mathcal{Y}{:}\, \mathcal{X} <= \mathcal{Y} \Rightarrow \mathcal{Y} <= \mathcal{X} \Rightarrow \mathcal{X} = \mathcal{Y}$]
[SystemQ **rule** leqTransitivityAxiom: $\Pi\mathcal{X},\mathcal{Y},\mathcal{Z}{:}\, \mathcal{X} <= \mathcal{Y} \Rightarrow \mathcal{Y} <= \mathcal{Z} \Rightarrow \mathcal{X} <= \mathcal{Z}$]
[SystemQ **rule** leqTotality: $\Pi\mathcal{X},\mathcal{Y}{:}\, \mathcal{X} <= \mathcal{Y} \dot{\vee} \mathcal{Y} <= \mathcal{X}$]
[SystemQ **rule** leqAdditionAxiom: $\Pi\mathcal{X},\mathcal{Y},\mathcal{Z}{:}\, \mathcal{X} <= \mathcal{Y} \Rightarrow (\mathcal{X} + \mathcal{Z}) <= (\mathcal{Y} + \mathcal{Z})$]
[SystemQ **rule** leqMultiplicationAxiom: $\Pi\mathcal{X},\mathcal{Y},\mathcal{Z}{:}\, 0 <= \mathcal{Z} \Rightarrow \mathcal{X} <= \mathcal{Y} \Rightarrow (\mathcal{X} * \mathcal{Z}) <= (\mathcal{Y} * \mathcal{Z})$]

[SystemQ **rule** plusAssociativity: $\Pi\mathcal{X},\mathcal{Y},\mathcal{Z}\colon (((\mathcal{X}+\mathcal{Y}))+\mathcal{Z}) = (\mathcal{X}+((\mathcal{Y}+\mathcal{Z})))$]

[SystemQ **rule** plusCommutativity: $\Pi\mathcal{X},\mathcal{Y}\colon (\mathcal{X}+\mathcal{Y}) = (\mathcal{Y}+\mathcal{X})$]

[SystemQ **rule** Negative: $\Pi\mathcal{X}\colon (\mathcal{X}+((-\mathrm{u}\mathcal{X}))) = 0$]

[SystemQ **rule** plus0: $\Pi\mathcal{X}\colon (\mathcal{X}+0) = \mathcal{X}$]

[SystemQ **rule** timesAssociativity: $\Pi\mathcal{X},\mathcal{Y},\mathcal{Z}\colon (((\mathcal{X}*\mathcal{Y}))*\mathcal{Z}) = (\mathcal{X}*((\mathcal{Y}*\mathcal{Z})))$]

[SystemQ **rule** timesCommutativity: $\Pi\mathcal{X},\mathcal{Y}\colon (\mathcal{X}*\mathcal{Y}) = (\mathcal{Y}*\mathcal{X})$]

[SystemQ **rule** ReciprocalAxiom: $\Pi\mathcal{X}\colon \mathcal{X} \neq 0 \Rightarrow (\mathcal{X}*\mathrm{rec}\mathcal{X}) = 1$]

[SystemQ **rule** times1: $\Pi\mathcal{X}\colon (\mathcal{X}*1) = \mathcal{X}$]

[SystemQ **rule** Distribution: $\Pi\mathcal{X},\mathcal{Y},\mathcal{Z}\colon (\mathcal{X}*((\mathcal{Y}+\mathcal{Z}))) = (((\mathcal{X}*\mathcal{Y}))+((\mathcal{X}*\mathcal{Z})))$]

[SystemQ **rule** 0not1: $0 \neq 1$]

[SystemQ **rule** EqualityAxiom: $\Pi\mathcal{X},\mathcal{Y},\mathcal{Z}\colon \mathcal{X}=\mathcal{Y} \Rightarrow \mathcal{X}=\mathcal{Z} \Rightarrow \mathcal{Y}=\mathcal{Z}$]

[SystemQ **rule** EqLeqAxiom: $\Pi\mathcal{X},\mathcal{Y}\colon \mathcal{X}=\mathcal{Y} \Rightarrow \mathcal{X} <= \mathcal{Y}$]

[SystemQ **rule** EqAdditionAxiom: $\Pi\mathcal{X},\mathcal{Y},\mathcal{Z}\colon \mathcal{X}=\mathcal{Y} \Rightarrow (\mathcal{X}+\mathcal{Z}) = (\mathcal{Y}+\mathcal{Z})$]

[SystemQ **rule** EqMultiplicationAxiom: $\Pi\mathcal{X},\mathcal{Y},\mathcal{Z}\colon \mathcal{X}=\mathcal{Y} \Rightarrow (\mathcal{X}*\mathcal{Z}) = (\mathcal{Y}*\mathcal{Z})$]

[SystemQ **rule** A4(Axiom): $\Pi\mathcal{X},\mathrm{V}_1,\mathcal{A},\mathcal{B}\colon \langle\mathcal{A}{\equiv}\mathcal{B}|\mathrm{V}_1{:==}\mathcal{X}\rangle_{\mathrm{Me}} \Vdash \forall\mathrm{V}_1\colon\mathcal{B} \Rightarrow \mathcal{A}$]

(*** XX snydeaksiomer ***)

[SystemQ **rule** ==Reflexivity: $\Pi\mathrm{RX}\colon \mathrm{RX} == \mathrm{RX}$]

[SystemQ **rule** ==Symmetry: $\Pi\mathrm{RX},\mathrm{RY}\colon \mathrm{RX} == \mathrm{RY} \vdash \mathrm{RY} == \mathrm{RX}$]

[SystemQ **rule** == Transitivity: $\Pi\mathrm{RX},\mathrm{RY},\mathrm{RZ}\colon \mathrm{RX} == \mathrm{RY} \vdash \mathrm{RY} == \mathrm{RZ} \vdash \mathrm{RX} == \mathrm{RZ}$]

XX ikke 100procent identisk med originalen fra equivalence-relations [SystemQ **r** $\mathrm{RX},\mathrm{RY}\colon \mathrm{RX} == \mathrm{RY} \vdash \mathrm{FX} \in \mathrm{RX} \vdash \mathrm{FX} \in \mathrm{RY}$]

XX boer bevises ud fra nummer 1 [SystemQ **rule** SENC2: $\Pi\mathrm{FX},\mathrm{RX},\mathrm{RY}\colon \mathrm{RX} ==$ $\mathrm{RY} \vdash \mathrm{FX} \in \mathrm{RY} \vdash \mathrm{FX} \in \mathrm{RX}$]

[SystemQ **rule** PlusF: $\Pi\mathcal{M},\mathrm{FX},\mathrm{FY}\colon \mathrm{FX} +_{\mathrm{f}} \mathrm{FY}[\mathcal{M}] = (\mathrm{FX}[\mathcal{M}] + \mathrm{FY}[\mathcal{M}])$]

[SystemQ **rule** From ==: $\Pi\mathrm{FX},\mathrm{FY}\colon \mathrm{R(FX)} == \mathrm{R(FY)} \vdash \mathrm{SF(FX,FY)}$]

[SystemQ **rule** To ==: $\Pi\mathrm{FX},\mathrm{FY}\colon \mathrm{SF(FX,FY)} \vdash \mathrm{R(FX)} == \mathrm{R(FY)}$]

[SystemQ **rule** FromInR: $\Pi\mathrm{FX},\mathrm{FY}\colon \mathrm{FX} \in \mathrm{R(FY)} \vdash \mathrm{SF(FX,FY)}$]

(*** makroer ***)

KVANTI

[$\mathrm{M}_1 \doteq \overline{(\mathrm{m1})}$] [$\mathrm{M}_2 \doteq \overline{(\mathrm{m2})}$] [$\mathrm{N}_1 \doteq \overline{(\mathrm{n1})}$] [$\mathrm{N}_2 \doteq \overline{(\mathrm{n2})}$] [$\mathrm{N}_3 \doteq \overline{(\mathrm{n3})}$] [$\epsilon \doteq \overline{(\epsilon)}$] [$\epsilon1 \doteq \overline{(\epsilon)_1}$] [$\epsilon2 \doteq \overline{(\epsilon2)}$] [$\mathrm{X}_1 \doteq \overline{(\mathrm{x1})}$] [$\mathrm{X}_2 \doteq \overline{(\mathrm{x2})}$] [$\mathrm{Y}_1 \doteq \overline{(\mathrm{y1})}$] [$\mathrm{Y}_2 \doteq \overline{(\mathrm{y2})}$] [$\mathrm{V}_1 \doteq \overline{(\mathrm{v1})}$] [$\mathrm{V}_2 \doteq \overline{(\mathrm{v2})}$] [$\mathrm{V}_3 \doteq \overline{(\mathrm{v3})}$] [$\mathrm{V}_4 \doteq \overline{(\mathrm{v4})}$] [$\mathrm{V}_{2\mathrm{n}} \doteq \overline{(\mathrm{v2n})}$] [$\mathrm{FX} \doteq \overline{(\mathrm{fx})}$] [$\mathrm{FY} \doteq \overline{(\mathrm{fy})}$] [$\mathrm{FZ} \doteq \overline{(\mathrm{fz})}$] [$\mathrm{FU} \doteq \overline{(\mathrm{fu})}$] [$\mathrm{FV} \doteq \overline{(\mathrm{fv})}$] [$\mathrm{FW} \doteq \overline{(\mathrm{fw})}$] [$\mathrm{FEP} \doteq \overline{(\mathrm{fep})}$] [$\mathrm{RX} \doteq \overline{(\mathrm{rx})}$] [$\mathrm{RY} \doteq \overline{(\mathrm{ry})}$] [$\mathrm{RZ} \doteq \overline{(\mathrm{rz})}$] [$\mathrm{RU} \doteq \overline{(\mathrm{ru})}$] [$(\mathrm{SX}) \doteq \overline{(\mathrm{sx})}$] [$(\mathrm{SX1}) \doteq \overline{(\mathrm{sx1})}$] [$(\mathrm{SY}) \doteq \overline{(\mathrm{sy})}$] [$(\mathrm{SY1}) \doteq \overline{(\mathrm{sy1})}$] [$(\mathrm{SZ}) \doteq \overline{(\mathrm{sz})}$] [$(\mathrm{SZ1}) \doteq \overline{(\mathrm{sz1})}$] [$(\mathrm{SU}) \doteq \overline{(\mathrm{su})}$] [$(\mathrm{SU1}) \doteq \overline{(\mathrm{su1})}$] [$\mathrm{FXS} \doteq \overline{(\mathrm{fxs})}$] [$\mathrm{FYS} \doteq \overline{(\mathrm{fys})}$] [$(\mathrm{F1}) \doteq \overline{(\mathrm{f1})}$] [$(\mathrm{F2}) \doteq \overline{(\mathrm{f2})}$] [$(\mathrm{F3}) \doteq \overline{(\mathrm{f3})}$] [$(\mathrm{F4}) \doteq \overline{(\mathrm{f4})}$] [$(\mathrm{OP1}) \doteq \overline{(\mathrm{op1})}$] [$(\mathrm{OP2}) \doteq \overline{(\mathrm{op2})}$] [$(\mathrm{R1}) \doteq \overline{(\mathrm{r1})}$] [$(\mathrm{S1}) \doteq \overline{(\mathrm{s1})}$] [$(\mathrm{S2}) \doteq \overline{(\mathrm{s2})}$]

[$(\mathrm{EPob}) \doteq \overline{(\epsilon)}$] [$(\mathrm{CRS1ob}) \doteq \overline{(\mathrm{crs1})}$] [$(\mathrm{F1ob}) \doteq \overline{(\mathrm{f1})}$] [$(\mathrm{F2ob}) \doteq \overline{(\mathrm{f2})}$] [$(\mathrm{F3ob}) \doteq \overline{(\mathrm{f3})}$] [$(\mathrm{F4ob}) \doteq \overline{(\mathrm{f4})}$] [$(\mathrm{N1ob}) \doteq \overline{(\mathrm{n1})}$] [$(\mathrm{N2ob}) \doteq \overline{(\mathrm{n2})}$] [$(\mathrm{OP1ob}) \doteq \overline{(\mathrm{op1})}$] [$(\mathrm{OP2ob}) \doteq \overline{(\mathrm{op2})}$] [$(\mathrm{R1ob}) \doteq \overline{(\mathrm{r1})}$] [$(\mathrm{S1ob}) \doteq \overline{(\mathrm{s1})}$] [$(\mathrm{S2ob}) \doteq \overline{(\mathrm{s2})}$]

$[(\mathrm{fx}) \leq_{\mathrm{f}} (\mathrm{fy}) \ddot{=} (\mathrm{fx}) <_{\mathrm{f}} (\mathrm{fy}) \dot{\vee} \mathrm{SF}((\mathrm{fx}), (\mathrm{fy}))]$
$[\mathrm{Ex3} \ddot{=} \mathsf{c}_{\mathrm{Ex}}]$
$[\exists(\mathrm{v1})\colon \mathsf{a} \ddot{=} \dot{\neg}\,(\forall(\mathrm{v1})\colon \dot{\neg}\,(\mathsf{a})\mathrm{n})\mathrm{n}]$
$[\mathsf{x} <<== \mathsf{y} \ddot{=} \mathsf{x} << \mathsf{y} \dot{\vee} \mathsf{x} == \mathsf{y}]$
$[(-1) \ddot{=} (-\mathrm{u}1)]$
$[2 \ddot{=} (1 + 1)]$
$[3 \ddot{=} (2 + 1)]$
$[1/2 \ddot{=} \mathrm{rec2}]$
$[1/3 \ddot{=} \mathrm{rec3}]$
$[2/3 \ddot{=} (2 * 1/3)]$
$[\mathsf{x} < \mathsf{y} \ddot{=} \mathsf{x} <= \mathsf{y} \dot{\wedge} \mathsf{x} \neq \mathsf{y}]$
$[\mathsf{x} \neq \mathsf{y} \ddot{=} \dot{\neg}\,(\mathsf{x} = \mathsf{y})\mathrm{n}]$
$[(\mathsf{x} - \mathsf{y}) \ddot{=} (\mathsf{x} + (-\mathrm{u}\mathsf{y}))]$
$[00 \ddot{=} \mathrm{R}(0\mathrm{f})]$
$[01 \ddot{=} \mathrm{R}(1\mathrm{f})]$
$[\mathsf{x}!! == \mathsf{y} \ddot{=} \dot{\neg}\,(\mathsf{x} == \mathsf{y})\mathrm{n}]$
(*** REGELLEMMAER ***)
(*** UDSAGNSLOGIK ***)
[SystemQ **lemma** ToNegatedImply: $\Pi\mathcal{A},\mathcal{B}\colon \mathcal{A} \vdash \dot{\neg}\,(\mathcal{B})\mathrm{n} \vdash \dot{\neg}\,((\mathcal{A} \Rightarrow \mathcal{B}))\mathrm{n}$]
SystemQ **proof of** ToNegatedImply:

L01:	Block $\gg$	Begin	;
L02:	Arbitrary $\gg$	$\mathcal{A},\mathcal{B}$	;
L03:	Premise $\gg$	$\mathcal{A}$	;
L04:	Premise $\gg$	$\dot{\neg}\,(\mathcal{B})\mathrm{n}$	;
L05:	Premise $\gg$	$\dot{\neg}\,(\dot{\neg}\,((\mathcal{A} \Rightarrow \mathcal{B}))\mathrm{n})\mathrm{n}$	;
L06:	RemoveDoubleNeg $\rhd$ L05 $\gg$	$\mathcal{A} \Rightarrow \mathcal{B}$	;
L07:	MP $\rhd$ L06 $\rhd$ L03 $\gg$	$\mathcal{B}$	;
L08:	FromContradiction $\rhd$ L07 $\rhd$ L04 $\gg$	$\dot{\neg}\,((\mathcal{A} \Rightarrow \mathcal{B}))\mathrm{n}$	;
L09:	Block $\gg$	End	;
L10:	Arbitrary $\gg$	$\mathcal{A},\mathcal{B}$	;
L11:	Ded $\rhd$ L09 $\gg$	$\mathcal{A} \Rightarrow \dot{\neg}\,(\mathcal{B})\mathrm{n} \Rightarrow \dot{\neg}\,(\dot{\neg}\,((\mathcal{A} \Rightarrow \mathcal{B}))\mathrm{n})\mathrm{n} \Rightarrow \dot{\neg}\,((\mathcal{A} \Rightarrow \mathcal{B}))\mathrm{n}$	;
L12:	Premise $\gg$	$\mathcal{A}$	;
L13:	Premise $\gg$	$\dot{\neg}\,(\mathcal{B})\mathrm{n}$	;
L14:	MP2 $\rhd$ L11 $\rhd$ L12 $\rhd$ L13 $\gg$	$\dot{\neg}\,(\dot{\neg}\,((\mathcal{A} \Rightarrow \mathcal{B}))\mathrm{n})\mathrm{n} \Rightarrow \dot{\neg}\,((\mathcal{A} \Rightarrow \mathcal{B}))\mathrm{n}$	;
L15:	AutoImply $\gg$	$\dot{\neg}\,(\dot{\neg}\,((\mathcal{A} \Rightarrow \mathcal{B}))\mathrm{n})\mathrm{n} \Rightarrow \dot{\neg}\,(\dot{\neg}\,((\mathcal{A} \Rightarrow \mathcal{B}))\mathrm{n})\mathrm{n}$	;
L16:	Neg $\rhd$ L14 $\rhd$ L15 $\gg$	$\dot{\neg}\,((\mathcal{A} \Rightarrow \mathcal{B}))\mathrm{n}$	$\square$

[SystemQ **lemma** TND: $\Pi\mathcal{A}\colon \mathcal{A} \dot{\vee} \dot{\neg}\,(\mathcal{A})\mathrm{n}$]
SystemQ **proof of** TND:

L01:	Arbitrary $\gg$	$\mathcal{A}$	;
L02:	AutoImply $\gg$	$\dot{\neg}\,(\mathcal{A})\mathrm{n} \Rightarrow \dot{\neg}\,(\mathcal{A})\mathrm{n}$	;
L03:	Repetition $\rhd$ L02 $\gg$	$\mathcal{A} \dot{\vee} \dot{\neg}\,(\mathcal{A})\mathrm{n}$	$\square$

[SystemQ **lemma** FromNegations: $\Pi\mathcal{A},\mathcal{B}\colon \mathcal{A} \Rightarrow \mathcal{B} \vdash \dot{\neg}\,(\mathcal{A})\mathrm{n} \Rightarrow \mathcal{B} \vdash \mathcal{B}$]

SystemQ **proof of** FromNegations:

L01:	Arbitrary $\gg$	$\mathcal{A}, \mathcal{B}$	;
L02:	Premise $\gg$	$\mathcal{A} \Rightarrow \mathcal{B}$	;
L03:	Premise $\gg$	$\dot{\neg}\,(\mathcal{A})\mathrm{n} \Rightarrow \mathcal{B}$	;
L04:	TND $\gg$	$\mathcal{A} \mathbin{\dot{\vee}} \dot{\neg}\,(\mathcal{A})\mathrm{n}$	;
L05:	FromDisjuncts $\rhd$ L04 $\rhd$ L02 $\rhd$ L03 $\gg$	$\mathcal{B}$	$\square$

[SystemQ **lemma** prop lemma imply negation: $\Pi\mathcal{A}\colon \mathcal{A} \Rightarrow \dot{\neg}\,(\mathcal{A})\mathrm{n} \vdash \dot{\neg}\,(\mathcal{A})\mathrm{n}$]

SystemQ **proof of** prop lemma imply negation:

L01:	Arbitrary $\gg$	$\mathcal{A}$	;
L02:	Premise $\gg$	$\mathcal{A} \Rightarrow \dot{\neg}\,(\mathcal{A})\mathrm{n}$	;
L03:	AutoImply $\gg$	$\dot{\neg}\,(\mathcal{A})\mathrm{n} \Rightarrow \dot{\neg}\,(\mathcal{A})\mathrm{n}$	;
L04:	TND $\gg$	$\mathcal{A} \mathbin{\dot{\vee}} \dot{\neg}\,(\mathcal{A})\mathrm{n}$	;
L05:	FromDisjuncts $\rhd$ L04 $\rhd$ L02 $\rhd$ L03 $\gg$	$\dot{\neg}\,(\mathcal{A})\mathrm{n}$	$\square$

[SystemQ **lemma** From3Disjuncts: $\Pi\mathcal{A}, \mathcal{B}, \mathcal{C}, \mathcal{D}\colon \mathcal{A} \mathbin{\dot{\vee}} \mathcal{B} \mathbin{\dot{\vee}} \mathcal{C} \vdash \mathcal{A} \Rightarrow \mathcal{D} \vdash \mathcal{B} \Rightarrow \mathcal{D} \vdash \mathcal{C} \Rightarrow \mathcal{D} \vdash \mathcal{D}$]

SystemQ **proof of** From3Disjuncts:

L01:	Block $\gg$	Begin	;
L02:	Arbitrary $\gg$	$\mathcal{A}, \mathcal{B}, \mathcal{C}, \mathcal{D}$	;
L03:	Premise $\gg$	$\mathcal{A} \mathbin{\dot{\vee}} \mathcal{B} \mathbin{\dot{\vee}} \mathcal{C}$	;
L04:	Premise $\gg$	$\mathcal{B} \Rightarrow \mathcal{D}$	;
L05:	Premise $\gg$	$\mathcal{C} \Rightarrow \mathcal{D}$	;
L06:	Premise $\gg$	$\dot{\neg}\,(\mathcal{A})\mathrm{n}$	;
L07:	Repetition $\rhd$ L03 $\gg$	$\dot{\neg}\,(\mathcal{A})\mathrm{n} \Rightarrow (\mathcal{B} \mathbin{\dot{\vee}} \mathcal{C})$	;
L08:	MP $\rhd$ L07 $\rhd$ L06 $\gg$	$\mathcal{B} \mathbin{\dot{\vee}} \mathcal{C}$	;
L09:	FromDisjuncts $\rhd$ L08 $\rhd$ L04 $\rhd$ L05 $\gg$	$\mathcal{D}$	;
L10:	Block $\gg$	End	;
L11:	Arbitrary $\gg$	$\mathcal{A}, \mathcal{B}, \mathcal{C}, \mathcal{D}$	;
L12:	Ded $\rhd$ L10 $\gg$	$\mathcal{A} \mathbin{\dot{\vee}} \mathcal{B} \mathbin{\dot{\vee}} \mathcal{C} \Rightarrow (\mathcal{B} \Rightarrow \mathcal{D}) \Rightarrow (\mathcal{C} \Rightarrow \mathcal{D}) \Rightarrow \dot{\neg}\,(\mathcal{A})\mathrm{n} \Rightarrow \mathcal{D}$	;
L13:	AutoImply $\gg$	$(\mathcal{A} \Rightarrow \mathcal{D}) \Rightarrow \mathcal{A} \Rightarrow \mathcal{D}$	;
L14:	Premise $\gg$	$\mathcal{A} \mathbin{\dot{\vee}} \mathcal{B} \mathbin{\dot{\vee}} \mathcal{C}$	;
L15:	Premise $\gg$	$\mathcal{A} \Rightarrow \mathcal{D}$	;
L16:	Premise $\gg$	$\mathcal{B} \Rightarrow \mathcal{D}$	;
L17:	Premise $\gg$	$\mathcal{C} \Rightarrow \mathcal{D}$	;
L18:	MP3 $\rhd$ L12 $\rhd$ L14 $\rhd$ L16 $\rhd$ L17 $\gg$	$\dot{\neg}\,(\mathcal{A})\mathrm{n} \Rightarrow \mathcal{D}$	;
L19:	MP $\rhd$ L13 $\rhd$ L15 $\gg$	$\mathcal{A} \Rightarrow \mathcal{D}$	;
L20:	FromNegations $\rhd$ L19 $\rhd$ L18 $\gg$	$\mathcal{D}$	$\square$

[SystemQ **lemma** NegateDisjunct1: $\Pi\mathcal{A}, \mathcal{B}\colon \mathcal{A} \mathbin{\dot{\vee}} \mathcal{B} \vdash \dot{\neg}\,(\mathcal{A})\mathrm{n} \vdash \mathcal{B}$]

SystemQ **proof of** NegateDisjunct1:

L01:	Arbitrary $\gg$	$\mathcal{A}, \mathcal{B}$	;
L02:	Premise $\gg$	$\mathcal{A} \mathbin{\dot{\vee}} \mathcal{B}$	;
L03:	Premise $\gg$	$\dot{\neg}\,(\mathcal{A})\mathrm{n}$	;
L04:	Repetition $\rhd$ L02 $\gg$	$\dot{\neg}\,(\mathcal{A})\mathrm{n} \Rightarrow \mathcal{B}$	;

L05: MP $\rhd$ L04 $\rhd$ L03 $\gg$ $\mathcal{B}$ $\Box$

[SystemQ **lemma** NegateDisjunct2: $\Pi\mathcal{A},\mathcal{B}\colon \mathcal{A} \dot{\vee} \mathcal{B} \vdash \dot{\neg}(\mathcal{B})\mathrm{n} \vdash \mathcal{A}$]

SystemQ **proof of** NegateDisjunct2:

L01: Arbitrary $\gg$ $\mathcal{A},\mathcal{B}$;
L02: Premise $\gg$ $\mathcal{A} \dot{\vee} \mathcal{B}$;
L03: Premise $\gg$ $\dot{\neg}(\mathcal{B})\mathrm{n}$;
L04: Repetition $\rhd$ L02 $\gg$ $\dot{\neg}(\mathcal{A})\mathrm{n} \Rightarrow \mathcal{B}$;
L05: NegativeMT $\rhd$ L04 $\rhd$ L03 $\gg$ $\mathcal{A}$ $\Box$

(***)

[SystemQ **lemma** ExpandDisjuncts: $\Pi\mathcal{A},\mathcal{B},\mathcal{C},\mathcal{D}\colon \mathcal{A} \dot{\vee} \mathcal{B} \vdash \mathcal{C} \dot{\vee} \mathcal{D} \vdash \mathcal{B} \dot{\vee} \mathcal{D} \dot{\vee} (\mathcal{A} \dot{\wedge} \mathcal{C})$]

SystemQ **proof of** ExpandDisjuncts:

L01: Block $\gg$ Begin ;
L02: Arbitrary $\gg$ $\mathcal{A},\mathcal{B},\mathcal{C},\mathcal{D}$;
L03: Premise $\gg$ $\mathcal{A} \dot{\vee} \mathcal{B}$;
L04: Premise $\gg$ $\mathcal{C} \dot{\vee} \mathcal{D}$;
L05: Premise $\gg$ $\dot{\neg}(\mathcal{B})\mathrm{n}$;
L06: Premise $\gg$ $\dot{\neg}(\mathcal{D})\mathrm{n}$;
L07: NegateDisjunct2 $\rhd$ L03 $\rhd$ L05 $\gg$ $\mathcal{A}$;
L08: NegateDisjunct2 $\rhd$ L04 $\rhd$ L06 $\gg$ $\mathcal{C}$;
L09: JoinConjuncts $\rhd$ L07 $\rhd$ L08 $\gg$ $\mathcal{A} \dot{\wedge} \mathcal{C}$;
L10: Block $\gg$ End ;
L11: Arbitrary $\gg$ $\mathcal{A},\mathcal{B},\mathcal{C},\mathcal{D}$;
L12: Ded $\rhd$ L10 $\gg$ $\mathcal{A} \dot{\vee} \mathcal{B} \Rightarrow \mathcal{C} \dot{\vee} \mathcal{D} \Rightarrow \dot{\neg}(\mathcal{B})\mathrm{n} \Rightarrow \dot{\neg}(\mathcal{D})\mathrm{n} \Rightarrow \mathcal{A} \dot{\wedge} \mathcal{C}$;
L13: Premise $\gg$ $\mathcal{A} \dot{\vee} \mathcal{B}$;
L14: Premise $\gg$ $\mathcal{C} \dot{\vee} \mathcal{D}$;
L15: MP2 $\rhd$ L12 $\rhd$ L13 $\rhd$ L14 $\gg$ $\dot{\neg}(\mathcal{B})\mathrm{n} \Rightarrow \dot{\neg}(\mathcal{D})\mathrm{n} \Rightarrow \mathcal{A} \dot{\wedge} \mathcal{C}$;
L16: Repetition $\rhd$ L15 $\gg$ $\mathcal{B} \dot{\vee} \mathcal{D} \dot{\vee} (\mathcal{A} \dot{\wedge} \mathcal{C})$ $\Box$

[SystemQ **lemma** From2 $*$ 2Disjuncts: $\Pi\mathcal{A},\mathcal{B},\mathcal{C},\mathcal{D},\mathcal{E}\colon \mathcal{A} \dot{\vee} \mathcal{B} \vdash \mathcal{C} \dot{\vee} \mathcal{D} \vdash \mathcal{A} \Rightarrow \mathcal{C} \Rightarrow \mathcal{E} \vdash \mathcal{A} \Rightarrow \mathcal{D} \Rightarrow \mathcal{E} \vdash \mathcal{B} \Rightarrow \mathcal{C} \Rightarrow \mathcal{E} \vdash \mathcal{B} \Rightarrow \mathcal{D} \Rightarrow \mathcal{E} \vdash \mathcal{E}$]

SystemQ **proof of** From2 $*$ 2Disjuncts:

L01: Block $\gg$ Begin ;
L02: Arbitrary $\gg$ $\mathcal{A},\mathcal{B},\mathcal{C},\mathcal{D},\mathcal{E}$;
L03: Premise $\gg$ $\mathcal{C} \dot{\vee} \mathcal{D}$;
L04: Premise $\gg$ $\mathcal{A} \Rightarrow \mathcal{C} \Rightarrow \mathcal{E}$;
L05: Premise $\gg$ $\mathcal{A} \Rightarrow \mathcal{D} \Rightarrow \mathcal{E}$;
L06: Premise $\gg$ $\mathcal{A}$;
L07: MP $\rhd$ L04 $\rhd$ L06 $\gg$ $\mathcal{C} \Rightarrow \mathcal{E}$;
L08: MP $\rhd$ L05 $\rhd$ L06 $\gg$ $\mathcal{D} \Rightarrow \mathcal{E}$;
L09: FromDisjuncts $\rhd$ L03 $\rhd$ L07 $\rhd$ L08 $\gg$ $\mathcal{E}$;
L10: Block $\gg$ End ;
L11: Block $\gg$ Begin ;
L12: Arbitrary $\gg$ $\mathcal{A},\mathcal{B},\mathcal{C},\mathcal{D},\mathcal{E}$;
L13: Premise $\gg$ $\mathcal{A} \dot{\vee} \mathcal{B}$;

L14: Premise $\gg$ $\mathcal{C} \dot{\vee} \mathcal{D}$;
L15: Premise $\gg$ $\mathcal{B} \Rightarrow \mathcal{C} \Rightarrow \mathcal{E}$;
L16: Premise $\gg$ $\mathcal{B} \Rightarrow \mathcal{D} \Rightarrow \mathcal{E}$;
L17: Premise $\gg$ $\dot{\neg}\,(\mathcal{A})\mathrm{n}$;
L18: NegateDisjunct1 $\rhd$ L13 $\rhd$ L17 $\gg$ $\mathcal{B}$;
L19: MP $\rhd$ L15 $\rhd$ L18 $\gg$ $\mathcal{C} \Rightarrow \mathcal{E}$;
L20: MP $\rhd$ L16 $\rhd$ L18 $\gg$ $\mathcal{D} \Rightarrow \mathcal{E}$;
L21: FromDisjuncts $\rhd$ L14 $\rhd$ L19 $\rhd$ L20 $\gg$ $\mathcal{E}$;
L22: Block $\gg$ End ;
L23: Arbitrary $\gg$ $\mathcal{A}, \mathcal{B}, \mathcal{C}, \mathcal{D}, \mathcal{E}$;
L24: Ded $\rhd$ L10 $\gg$ $\mathcal{C} \dot{\vee} \mathcal{D} \Rightarrow (\mathcal{A} \Rightarrow \mathcal{C} \Rightarrow \mathcal{E}) \Rightarrow (\mathcal{A} \Rightarrow \mathcal{D} \Rightarrow \mathcal{E}) \Rightarrow \mathcal{A} \Rightarrow \mathcal{E}$;
L25: Ded $\rhd$ L22 $\gg$ $\mathcal{A} \dot{\vee} \mathcal{B} \Rightarrow \mathcal{C} \dot{\vee} \mathcal{D} \Rightarrow (\mathcal{B} \Rightarrow \mathcal{C} \Rightarrow \mathcal{E}) \Rightarrow (\mathcal{B} \Rightarrow \mathcal{D} \Rightarrow \mathcal{E}) \Rightarrow \dot{\neg}\,(\mathcal{A})\mathrm{n} \Rightarrow \mathcal{E}$;
L26: Premise $\gg$ $\mathcal{A} \dot{\vee} \mathcal{B}$;
L27: Premise $\gg$ $\mathcal{C} \dot{\vee} \mathcal{D}$;
L28: Premise $\gg$ $\mathcal{A} \Rightarrow \mathcal{C} \Rightarrow \mathcal{E}$;
L29: Premise $\gg$ $\mathcal{A} \Rightarrow \mathcal{D} \Rightarrow \mathcal{E}$;
L30: Premise $\gg$ $\mathcal{B} \Rightarrow \mathcal{C} \Rightarrow \mathcal{E}$;
L31: Premise $\gg$ $\mathcal{B} \Rightarrow \mathcal{D} \Rightarrow \mathcal{E}$;
L32: MP3 $\rhd$ L24 $\rhd$ L27 $\rhd$ L28 $\rhd$ L29 $\gg$ $\mathcal{A} \Rightarrow \mathcal{E}$;
L33: MP4 $\rhd$ L25 $\rhd$ L26 $\rhd$ L27 $\rhd$ L30 $\rhd$ L31 $\gg$ $\dot{\neg}\,(\mathcal{A})\mathrm{n} \Rightarrow \mathcal{E}$;
L34: FromNegations $\rhd$ L32 $\rhd$ L33 $\gg$ $\mathcal{E}$ □

(*** SAME-F ***) XX-am
(*** R-AFDELINGEN ***) XX-am
(******************)

[SystemQ **lemma** FromNegatedImply: $\Pi \mathcal{A}, \mathcal{B}\colon \dot{\neg}\,((\mathcal{A} \Rightarrow \mathcal{B}))\mathrm{n} \vdash \mathcal{A} \dot{\wedge} \dot{\neg}\,(\mathcal{B})\mathrm{n}$]

SystemQ **proof of** FromNegatedImply:

L01: Block $\gg$ Begin ;
L02: Arbitrary $\gg$ $\mathcal{A}, \mathcal{B}$;
L03: Premise $\gg$ $\mathcal{A} \Rightarrow \dot{\neg}\,(\dot{\neg}\,(\mathcal{B})\mathrm{n})\mathrm{n}$;
L04: Premise $\gg$ $\mathcal{A}$;
L05: MP $\rhd$ L03 $\rhd$ L04 $\gg$ $\dot{\neg}\,(\dot{\neg}\,(\mathcal{B})\mathrm{n})\mathrm{n}$;
L06: RemoveDoubleNeg $\rhd$ L05 $\gg$ $\mathcal{B}$;
L07: Block $\gg$ End ;
L08: Arbitrary $\gg$ $\mathcal{A}, \mathcal{B}$;
L03: Ded $\rhd$ L07 $\gg$ $(\mathcal{A} \Rightarrow \dot{\neg}\,(\dot{\neg}\,(\mathcal{B})\mathrm{n})\mathrm{n}) \Rightarrow (\mathcal{A} \Rightarrow \mathcal{B})$;
L04: Premise $\gg$ $\dot{\neg}\,((\mathcal{A} \Rightarrow \mathcal{B}))\mathrm{n}$;
L05: MT $\rhd$ L03 $\rhd$ L04 $\gg$ $\dot{\neg}\,((\mathcal{A} \Rightarrow \dot{\neg}\,(\dot{\neg}\,(\mathcal{B})\mathrm{n})\mathrm{n}))\mathrm{n}$;
L09: Repetition $\rhd$ L05 $\gg$ $\mathcal{A} \dot{\wedge} \dot{\neg}\,(\mathcal{B})\mathrm{n}$ □

(***)

[SystemQ **lemma** FromNegated(2 $*$ Imply): $\Pi \mathcal{A}, \mathcal{B}, \mathcal{C}\colon \dot{\neg}\,((\mathcal{A} \Rightarrow \mathcal{B} \Rightarrow \mathcal{C}))\mathrm{n} \vdash \mathcal{A} \dot{\wedge} \mathcal{B} \dot{\wedge} \dot{\neg}\,(\mathcal{C})\mathrm{n}$]

SystemQ **proof of** FromNegated(2 ∗ Imply):

L01: Arbitrary $\gg$ $\mathcal{A}, \mathcal{B}, \mathcal{C}$;
L02: Premise $\gg$ $\dot{\neg}\,((\mathcal{A} \Rightarrow \mathcal{B} \Rightarrow \mathcal{C}))\mathrm{n}$;
L03: FromNegatedImply $\rhd$ L02 $\gg$ $\mathcal{A} \mathrel{\dot{\wedge}} \dot{\neg}\,((\mathcal{B} \Rightarrow \mathcal{C}))\mathrm{n}$;
L04: FirstConjunct $\rhd$ L03 $\gg$ $\mathcal{A}$;
L05: SecondConjunct $\rhd$ L03 $\gg$ $\dot{\neg}\,((\mathcal{B} \Rightarrow \mathcal{C}))\mathrm{n}$;
L06: FromNegatedImply $\rhd$ L05 $\gg$ $\mathcal{B} \mathrel{\dot{\wedge}} \dot{\neg}\,(\mathcal{C})\mathrm{n}$;
L07: FirstConjunct $\rhd$ L06 $\gg$ $\mathcal{B}$;
L08: SecondConjunct $\rhd$ L06 $\gg$ $\dot{\neg}\,(\mathcal{C})\mathrm{n}$;
L09: JoinConjuncts $\rhd$ L04 $\rhd$ L07 $\gg$ $\mathcal{A} \mathrel{\dot{\wedge}} \mathcal{B}$;
L10: JoinConjuncts $\rhd$ L09 $\rhd$ L08 $\gg$ $\mathcal{A} \mathrel{\dot{\wedge}} \mathcal{B} \mathrel{\dot{\wedge}} \dot{\neg}\,(\mathcal{C})\mathrm{n}$ $\square$

[SystemQ **lemma** FromNegatedOr: $\Pi \mathcal{A}, \mathcal{B}\colon \dot{\neg}\,((\mathcal{A} \mathrel{\dot{\vee}} \mathcal{B}))\mathrm{n} \vdash \dot{\neg}\,(\mathcal{A})\mathrm{n} \mathrel{\dot{\wedge}} \dot{\neg}\,(\mathcal{B})\mathrm{n}$]

SystemQ **proof of** FromNegatedOr:

L01: Arbitrary $\gg$ $\mathcal{A}, \mathcal{B}$;
L02: Premise $\gg$ $\dot{\neg}\,((\mathcal{A} \mathrel{\dot{\vee}} \mathcal{B}))\mathrm{n}$;
L03: Repetition $\rhd$ L02 $\gg$ $\dot{\neg}\,((\dot{\neg}\,(\mathcal{A})\mathrm{n} \Rightarrow \mathcal{B}))\mathrm{n}$;
L04: FromNegatedImply $\rhd$ L03 $\gg$ $\dot{\neg}\,(\mathcal{A})\mathrm{n} \mathrel{\dot{\wedge}} \dot{\neg}\,(\mathcal{B})\mathrm{n}$ $\square$

[SystemQ **rule** InductionAxiom: $\Pi \mathrm{V}_1, \mathcal{A}, \mathcal{B}, \mathcal{C}\colon \langle \mathcal{B} \equiv \mathcal{A} | \mathrm{V}_1 {:=} {=} 0 \rangle_{\mathrm{Me}} \Vdash \langle \mathcal{C} \equiv \mathcal{A} | \mathrm{V}_1 {:=}$
$1))\rangle_{\mathrm{Me}} \Vdash \mathcal{B} \Rightarrow \forall \mathrm{V}_1\colon (\mathcal{A} \Rightarrow \mathcal{C}) \Rightarrow \forall \mathrm{V}_1\colon \mathcal{A}$]

[SystemQ **rule** LessMinus1(N): $\Pi \mathcal{M}, \mathcal{N}\colon \mathrm{Nat}(\mathcal{M}) \Vdash \mathrm{Nat}(\mathcal{N}) \Vdash \mathcal{M} < (\mathcal{N} + 1) \vdash \mathcal{M} <= \mathcal{N}$]

[SystemQ **rule** Nonnegative(N): $\Pi \mathcal{M}\colon \mathrm{Nat}(\mathcal{M}) \Vdash 0 <= \mathcal{M}$]

[SystemQ **rule** Cauchy: $\Pi \mathrm{V}_1, \mathrm{V}_2, \mathcal{N}, \epsilon, \mathrm{FX}\colon \forall \epsilon\colon \exists \mathcal{N}\colon \forall \mathrm{V}_1, \mathrm{V}_2\colon (0 < \epsilon \Rightarrow \mathcal{N} <= \mathrm{V}_1 \Rightarrow \mathcal{N} <= \mathrm{V}_2 \Rightarrow |(\mathrm{FX}[\mathrm{V}_1] - \mathrm{FX}[\mathrm{V}_2])| < \epsilon)$]

[SystemQ **lemma** JoinConjuncts(2conditions): $\Pi \mathcal{A}, \mathcal{B}, \mathcal{C}, \mathcal{D}\colon \mathcal{A} \Rightarrow \mathcal{B} \Rightarrow \mathcal{C} \vdash \mathcal{A} \Rightarrow \mathcal{B} \Rightarrow \mathcal{D} \vdash \mathcal{A} \Rightarrow \mathcal{B} \Rightarrow \mathcal{C} \mathrel{\dot{\wedge}} \mathcal{D}$]

SystemQ **proof of** JoinConjuncts(2conditions):

L01: Block $\gg$ Begin ;
L02: Arbitrary $\gg$ $\mathcal{A}, \mathcal{B}, \mathcal{C}, \mathcal{D}$;
L03: Premise $\gg$ $\mathcal{A} \Rightarrow \mathcal{B} \Rightarrow \mathcal{C}$;
L04: Premise $\gg$ $\mathcal{A} \Rightarrow \mathcal{B} \Rightarrow \mathcal{D}$;
L05: Premise $\gg$ $\mathcal{A}$;
L06: Premise $\gg$ $\mathcal{B}$;
L07: MP2 $\rhd$ L03 $\rhd$ L05 $\rhd$ L06 $\gg$ $\mathcal{C}$;
L08: MP2 $\rhd$ L04 $\rhd$ L05 $\rhd$ L06 $\gg$ $\mathcal{D}$;
L09: JoinConjuncts $\rhd$ L07 $\rhd$ L08 $\gg$ $\mathcal{C} \mathrel{\dot{\wedge}} \mathcal{D}$;
L10: Block $\gg$ End ;
L11: Arbitrary $\gg$ $\mathcal{A}, \mathcal{B}, \mathcal{C}, \mathcal{D}$;
L03: Ded $\rhd$ L10 $\gg$ $(\mathcal{A} \Rightarrow \mathcal{B} \Rightarrow \mathcal{C}) \Rightarrow (\mathcal{A} \Rightarrow \mathcal{B} \Rightarrow \mathcal{D}) \Rightarrow \mathcal{A} \Rightarrow \mathcal{B} \Rightarrow \mathcal{C} \mathrel{\dot{\wedge}} \mathcal{D}$;
L04: Premise $\gg$ $\mathcal{A} \Rightarrow \mathcal{B} \Rightarrow \mathcal{C}$;
L05: Premise $\gg$ $\mathcal{A} \Rightarrow \mathcal{B} \Rightarrow \mathcal{D}$;
L12: MP2 $\rhd$ L03 $\rhd$ L04 $\rhd$ L05 $\gg$ $\mathcal{A} \Rightarrow \mathcal{B} \Rightarrow \mathcal{C} \mathrel{\dot{\wedge}} \mathcal{D}$ $\square$

[SystemQ **lemma** FromNegatedAnd: $\Pi\mathcal{A},\mathcal{B}\colon \dot\neg((\mathcal{A} \dot\wedge \mathcal{B}))\mathrm{n} \vdash \mathcal{A} \vdash \dot\neg(\mathcal{B})\mathrm{n}$]

SystemQ **proof of** FromNegatedAnd:

L01:	Arbitrary ≫	$\mathcal{A},\mathcal{B}$	;
L02:	Premise ≫	$\dot\neg((\mathcal{A} \dot\wedge \mathcal{B}))\mathrm{n}$	;
L03:	Premise ≫	$\mathcal{A}$	;
L04:	Repetition ▷ L02 ≫	$\dot\neg(\dot\neg((\mathcal{A} \Rightarrow \dot\neg(\mathcal{B})\mathrm{n}))\mathrm{n})\mathrm{n}$	;
L05:	RemoveDoubleNeg ▷ L04 ≫	$\mathcal{A} \Rightarrow \dot\neg(\mathcal{B})\mathrm{n}$	;
L06:	MP ▷ L05 ▷ L03 ≫	$\dot\neg(\mathcal{B})\mathrm{n}$	□

[SystemQ **lemma** ToNegatedOr: $\Pi\mathcal{A},\mathcal{B}\colon \dot\neg(\mathcal{A})\mathrm{n} \dot\wedge \dot\neg(\mathcal{B})\mathrm{n} \vdash \dot\neg((\mathcal{A} \dot\vee \mathcal{B}))\mathrm{n}$]

SystemQ **proof of** ToNegatedOr:

L01:	Block ≫	Begin	;
L02:	Arbitrary ≫	$\mathcal{A},\mathcal{B}$	;
L03:	Premise ≫	$\dot\neg(\mathcal{A})\mathrm{n} \dot\wedge \dot\neg(\mathcal{B})\mathrm{n}$	;
L04:	Premise ≫	$\mathcal{A} \dot\vee \mathcal{B}$	;
L05:	FirstConjunct ▷ L03 ≫	$\dot\neg(\mathcal{A})\mathrm{n}$	;
L06:	SecondConjunct ▷ L03 ≫	$\dot\neg(\mathcal{B})\mathrm{n}$	;
L07:	NegateDisjunct1 ▷ L04 ▷ L05 ≫	$\mathcal{B}$	;
L08:	FromContradiction ▷ L07 ▷ L06 ≫	$\dot\neg((\mathcal{A} \dot\vee \mathcal{B}))\mathrm{n}$	;
L09:	Block ≫	End	;
L10:	Arbitrary ≫	$\mathcal{A},\mathcal{B}$	;
L03:	Ded ▷ L09 ≫	$\dot\neg(\mathcal{A})\mathrm{n} \dot\wedge \dot\neg(\mathcal{B})\mathrm{n} \Rightarrow \mathcal{A} \dot\vee \mathcal{B} \Rightarrow \dot\neg((\mathcal{A} \dot\vee \mathcal{B}))\mathrm{n}$	;
L04:	Premise ≫	$\dot\neg(\mathcal{A})\mathrm{n} \dot\wedge \dot\neg(\mathcal{B})\mathrm{n}$	;
L05:	MP ▷ L03 ▷ L04 ≫	$\mathcal{A} \dot\vee \mathcal{B} \Rightarrow \dot\neg((\mathcal{A} \dot\vee \mathcal{B}))\mathrm{n}$	;
L11:	prop lemma imply negation ▷ L05 ≫	$\dot\neg((\mathcal{A} \dot\vee \mathcal{B}))\mathrm{n}$	□

[SystemQ **rule** NextXS(UpperBound): $\Pi\mathcal{M}\colon \mathrm{UB}(01//02{*}{*}(\mathrm{xs}[\mathcal{M}]{+}{+}\mathrm{us}[\mathcal{M}]),\mathrm{Se}$
$\mathrm{xs}[(\mathcal{M}+1)] == \mathrm{xs}[\mathcal{M}]$]

[SystemQ **rule** NextXS(NoUpperBound): $\Pi\mathcal{M}\colon \dot\neg(\mathrm{UB}(01//02{*}{*}(\mathrm{xs}[\mathcal{M}]{+}{+}\mathrm{us}[$
$\mathrm{xs}[(\mathcal{M}+1)] == 01//02**(\mathrm{xs}[\mathcal{M}]++\mathrm{us}[\mathcal{M}])$)]

[SystemQ **rule** NextUS(UpperBound): $\Pi\mathcal{M}\colon \mathrm{UB}(01//02{*}{*}(\mathrm{xs}[\mathcal{M}]{+}{+}\mathrm{us}[\mathcal{M}]),\mathrm{Se}$
$\mathrm{us}[(\mathcal{M}+1)] == 01//02**(\mathrm{xs}[\mathcal{M}]++\mathrm{us}[\mathcal{M}])$)]

[SystemQ **rule** NextUS(NoUpperBound): $\Pi\mathcal{M}\colon \dot\neg(\mathrm{UB}(01//02{*}{*}(\mathrm{xs}[\mathcal{M}]{+}{+}\mathrm{us}[$
$\mathrm{us}[(\mathcal{M}+1)] == \mathrm{us}[\mathcal{M}]$]

[SystemQ **rule** US0: $\mathrm{us}[0] == \mathrm{xs}[0]++01$]

[SystemQ **rule** ExpZero: $\Pi\mathcal{M},\mathcal{X}\colon \mathcal{M} = 0 \vdash \mathcal{X}(\exp)\mathcal{M} = 1$]

[SystemQ **rule** ExpPositive: $\Pi\mathcal{M},\mathcal{X}\colon 0 < \mathcal{M} \vdash \mathcal{X}(\exp)\mathcal{M} = (\mathcal{X}*\mathcal{X}(\exp)((\mathcal{M}-$
$1)))$]

[SystemQ **rule** BSzero: $\Pi\mathcal{M},\mathcal{N}\colon \mathcal{N} = 0 \vdash \mathrm{BS}(\mathcal{M},\mathcal{N}) = 1/2(\exp)\mathcal{M}$]

[SystemQ **rule** BSpositive: $\Pi\mathcal{M},\mathcal{N}\colon 0 < \mathcal{N} \vdash \mathrm{BS}(\mathcal{M},\mathcal{N}) = (1/2(\exp)((\mathcal{M} + \mathcal{N})) + \mathrm{BS}(\mathcal{M},(\mathcal{N}-1)))$]

———–

[SystemQ **rule** UStelescope(Zero): $\Pi\mathcal{M},\mathcal{N}\colon \mathcal{N} = 0 \vdash \mathrm{UStelescope}(\mathcal{M},\mathcal{N}) = |(\mathrm{us}[\mathcal{M}] - \mathrm{us}[(\mathcal{M}+1)])|$]

[SystemQ **rule** UStelescope(Positive): $\Pi\mathcal{M},\mathcal{N}\colon 0 < \mathcal{N} \vdash \mathrm{UStelescope}(\mathcal{M},\mathcal{N}) = (|(\mathrm{us}[(\mathcal{M}+\mathcal{N})] - \mathrm{us}[(\mathcal{M}+((\mathcal{N}+1)))])| + \mathrm{UStelescope}(\mathcal{M},(\mathcal{N}-1)))$]

[$(\mathsf{x}) \doteqdot (\mathsf{x})$]

———-

[SystemQ **rule** EqAddition(R): $\Pi\mathrm{FX},\mathrm{FY},\mathrm{FZ}\colon \mathrm{R(FX)} = \mathrm{R(FY)} \vdash \mathrm{R(FX)} + +\mathrm{R(FZ)} = \mathrm{R(FY)} + +\mathrm{R(FZ)}$]

[SystemQ **rule** PlusCommutativity(R): $\Pi\mathrm{FX},\mathrm{FY}\colon \mathrm{R(FX)}{+}{+}\mathrm{R(FY)} == \mathrm{R(FY)} +\mathrm{R(FX)}$]

————–

[SystemQ **rule** PlusAssociativity(R): $\Pi\mathrm{FX},\mathrm{FY},\mathrm{FZ}\colon \mathrm{R(FX)}{+}{+}\mathrm{R(FY)}{+}{+}\mathrm{R(FZ)}$ $\mathrm{R(FX)} + +(\mathrm{R(FY)} + +\mathrm{R(FZ)})$]

[SystemQ **rule** PlusAssociativity(R)XX: $\Pi\mathrm{FX},\mathrm{FY},\mathrm{FZ}\colon \mathrm{R}(\mathrm{FX}{+_\mathrm{f}}\mathrm{FY}{+_\mathrm{f}}\mathrm{FZ}) == \mathrm{R}(\mathrm{FX} +_\mathrm{f} (\mathrm{FY} +_\mathrm{f} \mathrm{FZ}))$]

[SystemQ **rule** Plus0(R): $\Pi\mathrm{FX}\colon \mathrm{R(FX)} + +00 == \mathrm{R(FX)}$]

[SystemQ **rule** Negative(R): $\Pi\mathcal{M},\mathrm{FX}\colon \mathrm{R(FX)} + +(- - \mathrm{R(FX)}) == 00$]

[SystemQ **rule** TimesAssociativity(R): $\Pi\mathrm{FX},\mathrm{FY},\mathrm{FZ}\colon \mathrm{R(FX)}{*}{*}\mathrm{R(FY)}{*}{*}\mathrm{R(FZ)}$ $\mathrm{R(FX)} * *(\mathrm{R(FY)} * *\mathrm{R(FZ)})$]

[SystemQ **rule** Times1(R): $\Pi\mathrm{FX}\colon \mathrm{R(FX)} * *01 == \mathrm{R(FX)}$]

———(21.10.06)

[SystemQ **rule** lessAddition(R): $\Pi\mathcal{M},\epsilon,\mathrm{FX},\mathrm{FY},\mathrm{FZ}\colon \mathrm{R(FX)} << \mathrm{R(FY)} \vdash \mathrm{R(FX}$ $+\mathrm{R(FZ)} << \mathrm{R(FY)} + +\mathrm{R(FZ)}$]

———–(23.10.06)

[SystemQ **rule** LeqAntisymmetry(R): $\Pi\mathrm{FX},\mathrm{FY}\colon \mathrm{R(FX)} <<== \mathrm{R(FY)} \vdash \mathrm{R(FY}$ $\mathrm{R(FX)} \vdash \mathrm{R(FX)} = \mathrm{R(FY)}$]

[SystemQ **rule** LeqTransitivity(R): $\Pi\mathrm{FX},\mathrm{FY},\mathrm{FZ}\colon \mathrm{R(FX)} <<== \mathrm{R(FY)} \vdash \mathrm{R(FY)} <<== \mathrm{R(FZ)} \vdash \mathrm{R(FX)} <<== \mathrm{R(FZ)}$]

———–(24.10.06)

[SystemQ **rule** leqAddition(R): $\Pi\mathrm{FX},\mathrm{FY},\mathrm{FZ}\colon \mathrm{R(FX)} <<== \mathrm{R(FY)} \vdash \mathrm{R(FX)}+ +\mathrm{R(FZ)} <<== \mathrm{R(FY)} + +\mathrm{R(FZ)}$]

[SystemQ **rule** Distribution(R): $\Pi\mathrm{FX},\mathrm{FY},\mathrm{FZ}\colon \mathrm{R(FX)}{*}{*}(\mathrm{R(FY)}{+}{+}\mathrm{R(FZ)}) = \mathrm{R(FX)} * *\mathrm{R(FY)} + +\mathrm{R(FX)} * *\mathrm{R(FZ)}$]

[$(- - 01) \doteqdot (- - 01)$]

———-(24.10.06)

[SystemQ **rule** FromLimit: $\Pi\mathcal{M},\mathcal{N},\mathrm{FEP},\mathrm{FX},\mathrm{FYS}\colon \mathrm{Limit(FX,FYS)} \vdash \forall\mathrm{FEP}\colon \exists$ $\mathrm{FEP} \Rightarrow \mathcal{M} <= \mathcal{N} \Rightarrow |\mathrm{rFX} + +(- - \mathrm{FYS}[\mathcal{N}])| << \mathrm{FEP})$]

[SystemQ **rule** ToUpperBound: $\Pi\mathrm{FX},\mathrm{FY},\mathrm{FXS}\colon \mathrm{FX} \in \mathrm{FXS} \Rightarrow \mathrm{FX} <<== \mathrm{FY} \vdash \mathrm{UB(FY,FXS)}$]

[SystemQ **rule** FromUpperBound: $\Pi\mathrm{FX},\mathrm{FY},\mathrm{FXS}\colon \mathrm{UB(FY,FXS)} \vdash \mathrm{FX} \in \mathrm{FXS}$ $\mathrm{FX} <<== \mathrm{FY}$]

[SystemQ **rule** USisUpperBound: $\Pi\mathcal{M}\colon \mathrm{UB}(\mathrm{usFoelge}[\mathcal{M}],\mathrm{SetOfFxs})$]

——(25.10.06)

[SystemQ **rule** 0not1(R): $00 \neq 01$]

———(25.10.06)

[SystemQ **rule** ExpZero(R): $\Pi\mathcal{M}, \mathrm{FX}\colon \mathcal{M} = 0 \vdash \mathrm{FX}(\exp)\mathcal{M} = 01$]

[SystemQ **rule** ExpPositive(R): $\Pi\mathcal{M}, \mathrm{FX}\colon 0 < \mathcal{M} \vdash \mathrm{FX}(\exp)\mathcal{M} == \mathrm{FX} * *\mathrm{FX}(\exp)((\mathcal{M} - 1))$]

—–(26.10.06)

[$02 \doteqdot 01 + +01$] [$01//02 \doteqdot 01//\mathrm{temp}02$]

——(28.10.06)

[SystemQ **rule** ExpUnbounded(R): $\Pi\mathcal{M}, \mathrm{FX}\colon \exists\mathcal{M}\colon \mathrm{FX} << 02(\exp)\mathcal{M}$]

——(30.10.06)

[SystemQ **rule** FromLeq(Advanced)(N): $\Pi\mathcal{M}, \mathrm{M}_1, \mathcal{N}\colon \mathcal{M} <= \mathcal{N} \vdash \exists \mathrm{M}_1\colon (\mathcal{M} + \mathrm{M}_1) = \mathcal{N}$]

——-(3.11.06)

[usFoelge $\doteqdot$ us]

[SystemQ **rule** FromLeastUpperBound: $\mathrm{LUB}(\mathrm{FX}, \mathrm{FYS}) \vdash \mathrm{UB}(\mathrm{FX}, \mathrm{FYS}) \dot\wedge (\mathrm{UB}(\mathrm{FZ}, \mathrm{FYS}) \Rightarrow \mathrm{FX} <<== \mathrm{FZ})$]

[SystemQ **rule** ToLeastUpperBound: $\Pi\mathrm{FX}, \mathrm{FZ}, \mathrm{FYS}\colon \mathrm{UB}(\mathrm{FX}, \mathrm{FYS}) \vdash \mathrm{UB}(\mathrm{FZ}, \mathrm{F}$
$\mathrm{FX} <<== \mathrm{FZ} \vdash \mathrm{LUB}(\mathrm{FX}, \mathrm{FYS})$]

[SystemQ **rule** XSisNotUpperBound: $\Pi\mathcal{M}\colon \dot\neg\,(\mathrm{UB}(\mathrm{xs}[\mathcal{M}], \mathrm{SetOfFxs}))\mathrm{n}$]

——-(4.11.06)

[xaF $\doteqdot$ xs]

[SystemQ **rule** ysFGreater: $\Pi\mathcal{M}\colon \mathrm{xaF}[\mathcal{M}] < \mathrm{ysF}[\mathcal{M}]$]

[SystemQ **rule** ysFLess: $\Pi\mathcal{M}\colon \mathrm{ysF}[\mathcal{M}] < (\mathrm{xaF}[\mathcal{M}] + \mathrm{rec}\mathcal{M})$]

[SystemQ **rule** SmallInverse: $\Pi\mathcal{M}, \mathcal{X}\colon 0 < \mathcal{X} \vdash \exists\mathcal{M}\colon \mathrm{rec}\mathcal{M} < \mathcal{X}$]

——-(6.11.06)

[$\mathsf{x} == \mathsf{y} \doteqdot \mathsf{x} = \mathsf{y}$]

[$\mathrm{OrderedPair}(\mathsf{x}, \mathsf{y}) \doteqdot \langle \mathsf{x}, \mathsf{y} \rangle$]

[SystemQ **rule** MemberOfSeries(Imply): $\Pi\mathcal{M}, \mathrm{FX}, (\mathrm{SY})\colon \mathcal{M} \in \mathrm{N} \Rightarrow \mathrm{IsSeries}(\mathrm{FX}$
$\mathrm{OrderedPair}(\mathcal{M}, \mathrm{FX}[\mathcal{M}]) \in \mathrm{FX}$]

[SystemQ **lemma** MemberOfSeries: $\Pi\mathcal{M}, \mathrm{FX}, (\mathrm{SY})\colon \mathcal{M} \in \mathrm{N} \vdash \mathrm{IsSeries}(\mathrm{FX}, (\mathrm{SY})$
$\mathrm{OrderedPair}(\mathcal{M}, \mathrm{FX}[\mathcal{M}]) \in \mathrm{FX}$]

SystemQ **proof of** MemberOfSeries:

L01:	Arbitrary $\gg$	$\mathcal{M}, \mathrm{FX}, (\mathrm{SY})$	;
L02:	Premise $\gg$	$\mathcal{M} \in \mathrm{N}$	;
L03:	Premise $\gg$	$\mathrm{IsSeries}(\mathrm{FX}, (\mathrm{SY}))$	;
L04:	MemberOfSeries(Imply) $\gg$	$\mathcal{M} \in \mathrm{N} \Rightarrow \mathrm{IsSeries}(\mathrm{FX}, (\mathrm{SY})) \Rightarrow \mathrm{OrderedPair}(\mathcal{M}, \mathrm{FX}[\mathcal{M}]) \in \mathrm{FX}$	;
L05:	MP2 $\rhd$ L04 $\rhd$ L02 $\rhd$ L03 $\gg$	$\mathrm{OrderedPair}(\mathcal{M}, \mathrm{FX}[\mathcal{M}]) \in \mathrm{FX}$	$\Box$

[SystemQ **lemma** memberOfSeries(Type): $\Pi\mathcal{M}, \mathrm{FX}, (\mathrm{SY})\colon \mathrm{TypeNat}(\mathcal{M}) \Vdash \mathrm{Typ}$
$\mathrm{OrderedPair}(\mathcal{M}, \mathrm{FX}[\mathcal{M}]) \in \mathrm{FX}$]

SystemQ **proof of** memberOfSeries(Type):

L01:	Arbitrary $\gg$	$\mathcal{M}, \mathrm{FX}, (\mathrm{SY})$	;
L02:	Side-condition $\gg$	$\mathrm{TypeNat}(\mathcal{M})$	;
L03:	Side-condition $\gg$	$\mathrm{TypeSeries}(\mathrm{FX}, (\mathrm{SY}))$	;
L04:	NatType $\trianglerighteq$ L02 $\gg$	$\mathcal{M} \in \mathrm{N}$	;

L05: SeriesType $\trianglerighteq$ L03 $\gg$ IsSeries(FX, (SY)) ;
L06: MemberOfSeries $\triangleright$ L04 $\triangleright$ L05 $\gg$ OrderedPair($\mathcal{M}$, FX[$\mathcal{M}$]) $\in$ FX $\square$

[SystemQ **rule** NatType: $\Pi\mathcal{M}$: TypeNat($\mathcal{M}$) $\Vdash \mathcal{M} \in$ N]

[SystemQ **rule** RationalType: $\Pi\mathcal{X}$: TypeRational($\mathcal{X}$) $\Vdash \mathcal{X} \in$ Q]

[SystemQ **rule** SeriesType: ΠFX, (SY): TypeSeries(FX, (SY)) $\Vdash$ IsSeries(FX, (S

[IsOrderedPair((sx), (sy), (sz)) $\ddot{=}$ $\exists$(OP1ob): $\exists$(OP2ob): (OP1ob) $\in$ (sy) $\dot{\wedge}$ (OP2ob) $\in$ (sz) $\dot{\wedge}$ (sx) = OrderedPair((OP1ob), (OP2ob))]

[IsRelation((sx), (sy), (sz)) $\ddot{=}$ $\forall$(R1ob): ((R1ob) $\in$ (sx) $\Rightarrow$ IsOrderedPair((R1ob)

[isFunction((sx), (sy), (sz)) $\ddot{=}$ IsRelation((sx), (sy), (sz)) $\dot{\wedge}$ $\forall$(F1ob), (F2ob), (F3ob), (F4ob): (OrderedPair((F1ob), (F2ob)) $\in$ (sx) $\Rightarrow$ OrderedPair((F3ob), (F4ob (sx) $\Rightarrow$ (F1ob) = (F3ob) $\Rightarrow$ (F2ob) = (F4ob))]

[IsSeries((fx), (fy)) $\ddot{=}$ isFunction((fx), N, (fy)) $\dot{\wedge}$ $\forall$(S1ob): ((S1ob) $\in$ N $\Rightarrow$ $\exists$(S2ob): OrderedPair((S1ob), (S2ob)) $\in$ (fx))]

XXhertype [TypeNat(x) $\ddot{=}$ λc.TypeNat0($\lceil$x$\rceil$)]

[TypeNat0(x) $\dot{=}$ x $\in_t$ ($\lceil 0 \rceil$ :: $\lceil V_{2n} \rceil$ :: $\lceil\mathcal{M}\rceil$ :: $\lceil\mathcal{N}\rceil$ :: $\lceil(\mathcal{N}+1)\rceil$ :: $\lceil(\mathcal{M}+0)\rceil$ :: $\lceil(\mathcal{M}+\mathcal{N})\rceil$ :: $\lceil\mathcal{O}\rceil$ :: $\lceil\mathcal{P}\rceil$ :: $\lceil((\mathcal{M}+\mathcal{N})+1)\rceil$ :: $\lceil(\mathcal{M}+M_1)\rceil$ :: $\lceil(\mathcal{M}+((\mathcal{N}+1)))\rceil$ :: $\lceil M_1\rceil$ :: $\lceil M_2\rceil$ :: $\lceil N_1\rceil$ :: $\lceil N_2\rceil$ :: $\lceil m\rceil$ :: $\lceil n\rceil$ :: T)]

[TypeSeries(x, y) $\ddot{=}$ λc.Typeseries0($\lceil$x$\rceil$, $\lceil$y$\rceil$)]

[Typeseries0(x, y) $\dot{=}$ y!x $\in_t$ ($\lceil$FX$\rceil$ :: $\lceil$FY$\rceil$ :: $\lceil$FZ$\rceil$ :: $\lceil$us$\rceil$ :: $\lceil$FX $+_f$ FY$\rceil$ :: $\lceil$0f$\rceil$ :: $\lceil$1f$\rceil$ :: $\lceil$FX $*_f$ 0f$\rceil$ :: $\lceil$1f/FX$\rceil$ :: T)]

[TypeRational(x) $\ddot{=}$ λc.TypeRational0($\lceil$x$\rceil$)]

[TypeRational0(x) $\dot{=}$ x $\in_t$ ($\lceil\mathcal{X}\rceil$ :: $\lceil\mathcal{Y}\rceil$ :: $\lceil\mathcal{Z}\rceil$ :: $\lceil 0\rceil$ :: $\lceil 1\rceil$ :: T)]

[Max(x, y) $\ddot{=}$ if(y <= x, x, y)]

——(7.11.06)

[SystemQ **rule** ReciprocalF: $\Pi\mathcal{M}$, FX: 1f/FX[$\mathcal{M}$] = if(FX[$\mathcal{M}$] = 0, 0, recFX[$\mathcal{M}$]

———(11.11.06)

[0f $\ddot{=}$ constantRationalSeries(0)] [1f $\ddot{=}$ constantRationalSeries(1)] [cartProd((sx) {ph $\in$ Power(Power(binaryUnion((sx), (sy)))) | IsOrderedPair(ph_1, (sx), (sy))}]

[constantRationalSeries(x) $\ddot{=}$ {ph $\in$ cartProd(N) | $\exists$(CRS1ob): ph_3 = OrderedP

[SystemQ **rule** Sep2Formula: $\Pi\mathcal{A}, \mathcal{B}, \mathcal{X}, \mathcal{Y}$: $\mathcal{Y} \in$ {ph $\in \mathcal{X}$ | $\mathcal{A}$} $\vdash \mathcal{Y} \in \mathcal{X} \dot{\wedge} \mathcal{B}$]

[Power(x) $\ddot{=}$ P(x)]

——-(12.11.06)

[IsSubset(x, y) $\ddot{=}$ x $\subseteq$ y]

——(12.11.06)

[SystemQ **rule** Formula2Sep: $\Pi\mathcal{A}, \mathcal{B}, \mathcal{X}, \mathcal{Y}$: $\mathcal{Y} \in \mathcal{X} \vdash \mathcal{B} \vdash \mathcal{Y} \in$ {ph $\in \mathcal{X}$ | $\mathcal{A}$}]

——(13.11.06)

[SystemQ **lemma** SameSeries: $\Pi\mathcal{M}, \mathcal{N}$, FX, (SY): TypeNat($\mathcal{M}$) $\Vdash$ TypeNat($\mathcal{N}$) TypeSeries(FX, (SY)) $\Vdash \mathcal{M} = \mathcal{N} \vdash$ FX[$\mathcal{M}$] = FX[$\mathcal{N}$]]

SystemQ **proof of** SameSeries:

L01: Arbitrary $\gg$ $\mathcal{M}, \mathcal{N}$, FX, (SY) ;
L02: Side-condition $\gg$ TypeNat($\mathcal{M}$) ;
L03: Side-condition $\gg$ TypeNat($\mathcal{N}$) ;
L04: Side-condition $\gg$ TypeSeries(FX, (SY)) ;
L05: Premise $\gg$ $\mathcal{M} = \mathcal{N}$;
L06: memberOfSeries(Type) $\trianglerighteq$
L02 $\trianglerighteq$ L04 $\gg$ OrderedPair($\mathcal{M}$, FX[$\mathcal{M}$]) $\in$ FX ;

L07: memberOfSeries(Type) $\rhd\!\!\rhd$
L03 $\rhd\!\!\rhd$ L04 $\gg$ $\text{OrderedPair}(\mathcal{N}, \text{FX}[\mathcal{N}]) \in \text{FX}$;

L08: UniqueMember(Type) $\rhd\!\!\rhd$
L04 $\rhd$ L06 $\rhd$ L07 $\rhd$ L05 $\gg$ $\text{FX}[\mathcal{M}] = \text{FX}[\mathcal{N}]$ □

[SystemQ **lemma** UniqueMember(Type): ΠFX, (SX), (SX1), (SY), (SY1), (SZ): OrderedPair((SX), (SX1)) $\in$ FX $\vdash$ OrderedPair((SY), (SY1)) $\in$ FX $\vdash$ (SX) $=$ (SY) $\vdash$ (SX1) $=$ (SY1)]

SystemQ **proof of** UniqueMember(Type):

L01: Arbitrary $\gg$ FX, (SX), (SX1), (SY), (SY1), (SZ) ;

L02: Side-condition $\gg$ TypeSeries(FX, (SZ)) ;

L03: Premise $\gg$ OrderedPair((SX), (SX1)) $\in$ FX ;

L04: Premise $\gg$ OrderedPair((SY), (SY1)) $\in$ FX ;

L05: Premise $\gg$ (SX) $=$ (SY) ;

L06: SeriesType $\rhd\!\!\rhd$ L02 $\gg$ IsSeries(FX, (SZ)) ;

L07: UniqueMember $\rhd$ L06 $\rhd$ L03 $\rhd$
L04 $\rhd$ L05 $\gg$ (SX1) $=$ (SY1) □

[SystemQ **lemma** UniqueMember: ΠFX, (SX), (SX1), (SY), (SY1), (SZ): IsSerie
OrderedPair((SX), (SX1)) $\in$ FX $\vdash$ OrderedPair((SY), (SY1)) $\in$ FX $\vdash$ (SX) $=$ (SY) $\vdash$ (SX1) $=$ (SY1)]

SystemQ **proof of** UniqueMember:

L01: Arbitrary $\gg$ FX, (SX), (SX1), (SY), (SY1), (SZ) ;

L02: Premise $\gg$ IsSeries(FX, (SZ)) ;

L03: Premise $\gg$ OrderedPair((SX), (SX1)) $\in$ FX ;

L04: Premise $\gg$ OrderedPair((SY), (SY1)) $\in$ FX ;

L05: Premise $\gg$ (SX) $=$ (SY) ;

L06: Repetition $\rhd$ L02 $\gg$ isFunction(FX, N, (SZ)) $\dot\wedge$ $\forall$(S1ob): ((S1ob) $\in$ N $\Rightarrow$ $\exists$(S2ob): OrderedPair((S1ob), (S2ob)) $\in$ FX) ;

L07: FirstConjunct $\rhd$ L06 $\gg$ isFunction(FX, N, (SZ)) ;

L08: Repetition $\rhd$ L07 $\gg$ IsRelation(FX, N, (SZ)) $\dot\wedge$ $\forall$(F1ob), (F2ob), (F3ob), (F4ob): (OrderedPair((F1ob), (F2ob)) $\in$ FX $\Rightarrow$ OrderedPair((F3ob), (F4ob)) $\in$ FX $\Rightarrow$ (F1ob) $=$ (F3ob) $\Rightarrow$ (F2ob) $=$ (F4ob)) ;

L09: SecondConjunct $\rhd$ L08 $\gg$ $\forall$(F1ob), (F2ob), (F3ob), (F4ob): (OrderedPair((F1ob), (F2ob)) $\in$ FX $\Rightarrow$ OrderedPair((F3ob), (F4ob)) $\in$ FX $\Rightarrow$ (F1ob) $=$ (F3ob) $\Rightarrow$ (F2ob) $=$ (F4ob)) ;

L10: A4 @(SX) $\rhd$ L09 $\gg$ $\forall$(F2ob), (F3ob), (F4ob): (OrderedPair((SX), (F2ob)) $\in$ FX $\Rightarrow$ OrderedPair((F3ob), (F4ob)) $\in$ FX $\Rightarrow$ (SX) $=$ (F3ob) $\Rightarrow$ (F2ob) $=$ (F4ob)) ;

L11: A4 @(SX1) $\rhd$ L10 $\gg$ $\forall$(F3ob), (F4ob): (OrderedPair((SX), (SX1)) $\in$ FX $\Rightarrow$ OrderedPair((F3ob), (F4ob)) $\in$ FX $\Rightarrow$ (SX) $=$ (F3ob) $\Rightarrow$ (SX1) $=$ (F4ob)) ;

L12: A4 @(SY) $\rhd$ L11 $\gg$ $\forall$(F4ob): (OrderedPair((SX), (SX1)) $\in$ FX $\Rightarrow$ OrderedPair((SY), (F4ob)) $\in$ FX $\Rightarrow$ (SX) $=$ (SY) $\Rightarrow$ (SX1) $=$ (F4ob)) ;

L13: A4 @(SY1) $\rhd$ L12 $\gg$ OrderedPair((SX), (SX1)) $\in$ FX $\Rightarrow$ OrderedPair((SY), (SY1)) $\in$ FX $\Rightarrow$ (SX) $=$ (SY) $\Rightarrow$ (SX1) $=$ (SY1) ;

L14: MP3 $\rhd$ L13 $\rhd$ L03 $\rhd$ L04 $\rhd$ L05 $\gg$ (SX1) $=$ (SY1) $\square$

[SystemQ **lemma** A4: $\Pi\mathcal{X}, \mathrm{V}_1, \mathcal{A}, \mathcal{B}$: $\langle \mathcal{A} \equiv \mathcal{B} | \mathrm{V}_1 := = \mathcal{X} \rangle_{\mathrm{Me}} \Vdash \forall \mathrm{V}_1 : \mathcal{B} \vdash \mathcal{A}$]

KVANTI SystemQ **proof of** A4:

L01: Arbitrary $\gg$ $\mathcal{X}, \mathrm{V}_1, \mathcal{A}, \mathcal{B}$;

L02: Side-condition $\gg$ $\langle \mathcal{A} \equiv \mathcal{B} | \mathrm{V}_1 := = \mathcal{X} \rangle_{\mathrm{Me}}$;

L03: Premise $\gg$ $\forall \mathrm{V}_1 : \mathcal{B}$;

L04: A4(Axiom) $\unrhd$ L02 $\gg$ $\forall \mathrm{V}_1 : \mathcal{B} \Rightarrow \mathcal{A}$;

L05: MP $\rhd$ L04 $\rhd$ L03 $\gg$ $\mathcal{A}$ $\square$

——(16.11.06)

[SystemQ **rule** SameMember: Π(SX), (SY), (SZ): (SX) $=$ (SY) $\vdash$ (SX) $\in$ (SZ) $\vdash$ (SY) $\in$ (SZ)]

[SystemQ **rule** ToSetEquality: Π(SX), FY: IsSubset(FX, FY) $\vdash$ IsSubset(FY, FX) $\vdash$ FX $=$ FY]

[(px, y) $\doteqdot$ {x, y}]

[SystemQ **rule** SamePair: Π(SX), (SX1), (SY), (SY1): (SX) $=$ (SX1) $\vdash$ (SY) $=$ (SY1) $\vdash$ (p(SX), (SY)) $=$ (p(SX1), (SY1))]

[(sx) $\doteqdot$ {x}]

[SystemQ **rule** SameSingleton: Π(SX), (SY): (SX) $=$ (SY) $\vdash$ (s(SX)) $=$ (s(SY))]

———-(17.11.06)

[(fx) $+_{\mathrm{f}}$ (fy) $\doteqdot$ {ph $\in$ cartProd(N) | $\exists\mathcal{M}$: ph_4 = OrderedPair($\mathcal{M}$, ((fx)[$\mathcal{M}$] + (fy)[$\mathcal{M}$]))}]

[SystemQ **rule** Qclosed(Addition): $\Pi\mathcal{X},\mathcal{Y}$: $\mathcal{X} \in$ Q $\vdash$ $\mathcal{Y} \in$ Q $\vdash$ $(\mathcal{X} + \mathcal{Y}) \in$ Q]

[SystemQ **rule** FromCartProd(1): Π(SX), (SX1), (SY), (SY1): OrderedPair((SX
cartProd((SX1)) $\vdash$ (SX) $\in$ (SX1)]

[SystemQ **rule** 1rule fromCartProd(2): Π(SX), (SX1), (SY), (SY1): OrderedPai
cartProd((SX1)) $\vdash$ (SY) $\in$ (SY1)]

———-(18.11.06)

[(fx) $*_{\mathrm{f}}$ (fy) $\doteqdot$ {ph $\in$ cartProd(N) | $\exists\mathcal{M}$: ph_5 = OrderedPair($\mathcal{M}$, ((fx)[$\mathcal{M}$] $*$ (fy)[$\mathcal{M}$]))}]

[SystemQ **rule** Qclosed(Multiplication): $\Pi\mathcal{X},\mathcal{Y}$: $\mathcal{X} \in$ Q $\vdash$ $\mathcal{Y} \in$ Q $\vdash$ $(\mathcal{X} * \mathcal{Y}) \in$ Q]

———-(19.11.06)

[SystemQ **rule** Pair2Formula: Π(SX), (SY), (SZ): (SX) $\in$ (p(SY), (SZ)) $\vdash$ (SX) =
(SY) $\dot\vee$ (SX) = (SZ)]

[SystemQ **rule** Formula2Pair: Π(SX), (SY), (SZ): (SX) = (SY) $\dot\vee$ (SX) = (SZ) $\vdash$ (SX) $\in$ (p(SY), (SZ))]

—-(23.11.06)

[binaryUnion(x, y) $\doteqdot$ Union((px, y))]

[SystemQ **rule** Formula2Union: Π(SX), (SY), (SZ): $\exists$(SY): (SX) $\in$ (SY) $\dot\wedge$ (SY)
(SZ) $\vdash$ (SX) $\in$ Union((SZ))]

[SystemQ **rule** Formula2Power: Π(SX), (SY): IsSubset((SX), (SY)) $\vdash$ (SX) $\in$ Power((SY))]

———-(28.11.06)

[SetOfRationalSeries $\doteqdot$ {ph $\in$ Power(cartProd(N)) | IsSeries(ph_2, Q)}]

[1f/(fx) $\doteqdot$ {ph $\in$ cartProd(N) | $\exists\mathcal{M}$: ((fx)[$\mathcal{M}$] $\neq 0$ $\dot\wedge$ ph_6 = OrderedPair($\mathcal{M}$, rec
((fx)[$\mathcal{M}$] = 0 $\dot\wedge$ ph_6 = OrderedPair($\mathcal{M}$, 0))}]

[SystemQ **rule** Max: $\Pi\mathcal{X},\mathcal{Y}$: ($\mathcal{Y}$ <= $\mathcal{X}$ $\dot\wedge$ Max($\mathcal{X},\mathcal{Y}$) = $\mathcal{X}$) $\dot\vee$ ($\dot\neg$($\mathcal{Y}$ <= $\mathcal{X}$)n $\dot\wedge$ Max($\mathcal{X},\mathcal{Y}$) = $\mathcal{Y}$)]

[SystemQ **rule** Numerical: $\Pi\mathcal{X}$: (0 <= $\mathcal{X}$ $\dot\wedge$ $|\mathcal{X}| = \mathcal{X}$) $\dot\vee$ ($\dot\neg$(0 <= $\mathcal{X}$)n $\dot\wedge$ $|\mathcal{X}|$ = (−u$\mathcal{X}$))]

[SystemQ **rule** Separation2formula(1): $\Pi\mathcal{A},\mathcal{B},\mathcal{X},\mathcal{Y}$: $\mathcal{Y} \in$ {ph $\in \mathcal{X}$ | $\mathcal{A}$} $\vdash$ $\mathcal{Y} \in \mathcal{X}$]

[SystemQ **rule** Separation2formula(2): $\Pi\mathcal{A},\mathcal{B},\mathcal{X},\mathcal{Y}$: $\mathcal{Y} \in$ {ph $\in \mathcal{X}$ | $\mathcal{A}$} $\vdash$ $\mathcal{B}$]

[SystemQ **rule** QisClosed(Reciprocal)(Imply): $\Pi\mathcal{X}$: $\mathcal{X} \neq 0 \Rightarrow \mathcal{X} \in$ Q $\Rightarrow$ rec$\mathcal{X} \in$ Q]

[SystemQ **lemma** QisClosed(Reciprocal): $\Pi\mathcal{X}$: $\mathcal{X} \neq 0 \vdash \mathcal{X} \in$ Q $\vdash$ rec$\mathcal{X} \in$ Q]

SystemQ **proof of** QisClosed(Reciprocal):

L01:	Arbitrary $\gg$	$\mathcal{X}$	;
L02:	Premise $\gg$	$\mathcal{X} \neq 0$	;
L03:	Premise $\gg$	$\mathcal{X} \in$ Q	;
L04:	QisClosed(Reciprocal)(Imply) $\gg$	$\mathcal{X} \neq 0 \Rightarrow \mathcal{X} \in$ Q $\Rightarrow$ rec$\mathcal{X} \in$ Q	;
L05:	MP2 $\rhd$ L04 $\rhd$ L02 $\rhd$ L03 $\gg$	rec$\mathcal{X} \in$ Q	$\square$

———(1.12.06)

[SystemQ **rule** QisClosed(Negative)(Imply): $\Pi\mathcal{X}\colon \mathcal{X} \in \mathrm{Q} \Rightarrow (-\mathrm{u}\mathcal{X}) \in \mathrm{Q}$]

[SystemQ **lemma** QisClosed(Negative): $\Pi\mathcal{X}\colon \mathcal{X} \in \mathrm{Q} \vdash (-\mathrm{u}\mathcal{X}) \in \mathrm{Q}$]

SystemQ **proof of** QisClosed(Negative):

L01:	Arbitrary ≫	$\mathcal{X}$	;
L02:	Premise ≫	$\mathcal{X} \in \mathrm{Q}$	;
L03:	QisClosed(Negative)(Imply) ≫	$\mathcal{X} \in \mathrm{Q} \Rightarrow (-\mathrm{u}\mathcal{X}) \in \mathrm{Q}$	;
L04:	MP ⊳ L03 ⊳ L02 ≫	$(-\mathrm{u}\mathcal{X}) \in \mathrm{Q}$	□

[$-_{\mathrm{f}}(\mathrm{fx}) \doteq \{\mathrm{ph} \in \mathrm{cartProd}(\mathrm{N}) \mid \exists\mathcal{M}\colon \mathrm{ph}_6 = \mathrm{OrderedPair}(\mathcal{M}, (-\mathrm{u}(\mathrm{fx})[\mathcal{M}]))\}$]

[$\mathrm{SF}((\mathrm{fx}),(\mathrm{fy})) \doteq \forall(\mathrm{EPob})\colon \exists n\colon \forall m\colon (0 < (\mathrm{EPob}) \Rightarrow n <= m \Rightarrow |((\mathrm{fx})[m] - (\mathrm{fy})[m])| < (\mathrm{EPob}))$]

——(2.12.06)

[$(\mathrm{fx}) <_{\mathrm{f}} (\mathrm{fy}) \doteq \exists(\mathrm{EPob})\colon \exists n\colon \forall m\colon 0 < (\mathrm{EPob}) \dot{\wedge} (n <= m \Rightarrow (\mathrm{fx})[m] <= ((\mathrm{fy})[m] - (\mathrm{EPob})))$]

——(2.12.06)

[$\mathrm{extractSeries}(\mathsf{t}) \doteq \mathsf{t}^{22121222111111}$]

[$\mathrm{SetOfSeries}((\mathrm{sx})) \doteq \{\mathrm{ph} \in \mathrm{Power}(\mathrm{cartProd}(\mathrm{N})) \mid \mathrm{IsSeries}(\mathrm{ph}_6, (\mathrm{sx}))\}$]

[$\mathrm{R}((\mathrm{fx})) \doteq \{\mathrm{ph} \in \mathrm{Power}(\mathrm{SetOfSeries}(\mathrm{Q})) \mid \mathrm{SF}((\mathrm{fx}), \mathrm{ph}_4)\}$]

[$\mathrm{ExpandList}(\mathsf{t},\mathsf{s},\mathsf{c}) \doteq \mathsf{t}!\mathsf{s}!\mathsf{c}!$**if** t^{a} **then** T **else** $\mathrm{StateExpand}(\mathsf{t}^{\mathrm{h}},\mathsf{s},\mathsf{c}) :: \mathrm{ExpandList}$

(***)

([$\mathsf{x} * * \mathsf{y} \overset{\mathrm{macro}}{\to} \lambda\mathsf{t}.\lambda\mathsf{s}.\lambda\mathsf{c}. **\mathrm{Macro}(\mathsf{t}^{\mathrm{h}} :: \mathrm{ExpandList}(\mathsf{t}^{\mathrm{t}},\mathsf{s},\mathsf{c}))$])$^{\mathbf{p}}$

[$**\mathrm{Macro}(\mathsf{t}) \overset{\mathrm{val}}{\to} \tilde{\mathcal{Q}}(\mathsf{t}, \lceil \mathrm{R}(\mathsf{x}*_{\mathrm{f}}\mathsf{y})\rceil, (\lceil\mathsf{x}\rceil :: \mathrm{extractSeries}(\mathsf{t}^1)) :: (\lceil\mathsf{y}\rceil :: \mathrm{extractSeries}($
$\mathsf{T})$]

(***)

([$\mathsf{x} + + \mathsf{y} \overset{\mathrm{macro}}{\to} \lambda\mathsf{t}.\lambda\mathsf{s}.\lambda\mathsf{c}. ++\mathrm{Macro}(\mathsf{t}^{\mathrm{h}} :: \mathrm{ExpandList}(\mathsf{t}^{\mathrm{t}},\mathsf{s},\mathsf{c}))$])$^{\mathbf{p}}$

[$++\mathrm{Macro}(\mathsf{t}) \overset{\mathrm{val}}{\to} \tilde{\mathcal{Q}}(\mathsf{t}, \lceil \mathrm{R}(\mathsf{x}+_{\mathrm{f}}\mathsf{y})\rceil, (\lceil\mathsf{x}\rceil :: \mathrm{extractSeries}(\mathsf{t}^1)) :: (\lceil\mathsf{y}\rceil :: \mathrm{extractSerie}$
$\mathsf{T})$]

(***)

([$(- - \mathsf{x}) \overset{\mathrm{macro}}{\to} \lambda\mathsf{t}.\lambda\mathsf{s}.\lambda\mathsf{c}. --\mathrm{Macro}(\mathsf{t}^{\mathrm{h}} :: \mathrm{ExpandList}(\mathsf{t}^{\mathrm{t}},\mathsf{s},\mathsf{c}))$])$^{\mathbf{p}}$

[$- - \mathrm{Macro}(\mathsf{t}) \overset{\mathrm{val}}{\to} \tilde{\mathcal{Q}}(\mathsf{t}, \lceil \mathrm{R}(-_{\mathrm{f}}\mathsf{x})\rceil, (\lceil\mathsf{x}\rceil :: \mathrm{extractSeries}(\mathsf{t}^1)) :: \mathsf{T})$]

(****)

([$\mathsf{x} << \mathsf{y} \overset{\mathrm{macro}}{\to} \lambda\mathsf{t}.\lambda\mathsf{s}.\lambda\mathsf{c}. << \mathrm{Macro}(\mathsf{t}^{\mathrm{h}} :: \mathrm{ExpandList}(\mathsf{t}^{\mathrm{t}},\mathsf{s},\mathsf{c}))$])$^{\mathbf{p}}$

[$<< \mathrm{Macro}(\mathsf{t}) \overset{\mathrm{val}}{\to} \tilde{\mathcal{Q}}(\mathsf{t}, \lceil \mathsf{x} <_{\mathrm{f}} \mathsf{y}\rceil, (\lceil\mathsf{x}\rceil :: \mathrm{extractSeries}(\mathsf{t}^1)) :: (\lceil\mathsf{y}\rceil :: \mathrm{extractSeries}($
$\mathsf{T})$]

——(3.12.06)

[$\mathrm{StateExpand}(\mathsf{t},\mathsf{s},\mathsf{c}) \doteq \mathsf{t}!\mathsf{s}!\mathsf{c}!\mathcal{U}^{\mathrm{M}}(\mathsf{s}^{\mathrm{h}} ` \mathsf{t} ` \mathsf{s} ` \mathsf{c})$]

——(5.12.06)

[SystemQ **lemma** lemma eqLeq(R): $\Pi\mathrm{FX},\mathrm{FY}\colon \mathrm{R}(\mathrm{FX}) = \mathrm{R}(\mathrm{FY}) \vdash \mathrm{R}(\mathrm{FX}) <<= \mathrm{R}(\mathrm{FY})$]

SystemQ **proof of** lemma eqLeq(R):

L01:	Arbitrary ≫	FX,FY	;
L02:	Premise ≫	$\mathrm{R}(\mathrm{FX}) = \mathrm{R}(\mathrm{FY})$	;
L03:	WeakenOr1 ⊳ L02 ≫	$\mathrm{R}(\mathrm{FX}) << \mathrm{R}(\mathrm{FY}) \dot{\vee} \mathrm{R}(\mathrm{FX}) = \mathrm{R}(\mathrm{FY})$	;

L04: Repetition $\rhd$ L03 $\gg$ R(FX) <<== R(FY) $\square$

——(5.12.06)

[SystemQ **lemma** LessLeq(R): ΠFX, FY: R(FX) << R(FY) $\vdash$ R(FX) <<== R(FY)]

SystemQ **proof of** LessLeq(R):

L01: Arbitrary $\gg$ FX, FY ;
L02: Premise $\gg$ R(FX) << R(FY) ;
L03: WeakenOr2 $\rhd$ L02 $\gg$ R(FX) << R(FY) $\dot{\vee}$ R(FX) = R(FY) ;
L04: Repetition $\rhd$ L03 $\gg$ R(FX) <<== R(FY) $\square$

——(7.12.06)

[SystemQ **lemma** MP2: $\Pi\mathcal{A},\mathcal{B},\mathcal{C}$: $\mathcal{A} \Rightarrow \mathcal{B} \Rightarrow \mathcal{C} \vdash \mathcal{A} \vdash \mathcal{B} \vdash \mathcal{C}$]

SystemQ **proof of** MP2:

L01: Arbitrary $\gg$ $\mathcal{A},\mathcal{B},\mathcal{C}$;
L02: Premise $\gg$ $\mathcal{A} \Rightarrow \mathcal{B} \Rightarrow \mathcal{C}$;
L03: Premise $\gg$ $\mathcal{A}$;
L04: Premise $\gg$ $\mathcal{B}$;
L05: MP $\rhd$ L02 $\rhd$ L03 $\gg$ $\mathcal{B} \Rightarrow \mathcal{C}$;
L06: MP $\rhd$ L05 $\rhd$ L04 $\gg$ $\mathcal{C}$ $\square$

[SystemQ **lemma** MP3: $\Pi\mathcal{A},\mathcal{B},\mathcal{C},\mathcal{D}$: $\mathcal{A} \Rightarrow \mathcal{B} \Rightarrow \mathcal{C} \Rightarrow \mathcal{D} \vdash \mathcal{A} \vdash \mathcal{B} \vdash \mathcal{C} \vdash \mathcal{D}$]

SystemQ **proof of** MP3:

L01: Arbitrary $\gg$ $\mathcal{A},\mathcal{B},\mathcal{C},\mathcal{D}$;
L02: Premise $\gg$ $\mathcal{A} \Rightarrow \mathcal{B} \Rightarrow \mathcal{C} \Rightarrow \mathcal{D}$;
L03: Premise $\gg$ $\mathcal{A}$;
L04: Premise $\gg$ $\mathcal{B}$;
L05: Premise $\gg$ $\mathcal{C}$;
L06: MP2 $\rhd$ L02 $\rhd$ L03 $\rhd$ L04 $\gg$ $\mathcal{C} \Rightarrow \mathcal{D}$;
L07: MP $\rhd$ L06 $\rhd$ L05 $\gg$ $\mathcal{D}$ $\square$

[SystemQ **lemma** MP4: $\Pi\mathcal{A},\mathcal{B},\mathcal{C},\mathcal{D},\mathcal{E}$: $\mathcal{A} \Rightarrow \mathcal{B} \Rightarrow \mathcal{C} \Rightarrow \mathcal{D} \Rightarrow \mathcal{E} \vdash \mathcal{A} \vdash \mathcal{B} \vdash \mathcal{C} \vdash \mathcal{D} \vdash \mathcal{E}$]

SystemQ **proof of** MP4:

L01: Arbitrary $\gg$ $\mathcal{A},\mathcal{B},\mathcal{C},\mathcal{D},\mathcal{E}$;
L02: Premise $\gg$ $\mathcal{A} \Rightarrow \mathcal{B} \Rightarrow \mathcal{C} \Rightarrow \mathcal{D} \Rightarrow \mathcal{E}$;
L03: Premise $\gg$ $\mathcal{A}$;
L04: Premise $\gg$ $\mathcal{B}$;
L05: Premise $\gg$ $\mathcal{C}$;
L06: Premise $\gg$ $\mathcal{D}$;
L07: MP2 $\rhd$ L02 $\rhd$ L03 $\rhd$ L04 $\gg$ $\mathcal{C} \Rightarrow \mathcal{D} \Rightarrow \mathcal{E}$;
L08: MP2 $\rhd$ L07 $\rhd$ L05 $\rhd$ L06 $\gg$ $\mathcal{E}$ $\square$

[SystemQ **lemma** MP5: $\Pi\mathcal{A},\mathcal{B},\mathcal{C},\mathcal{D},\mathcal{E},\mathcal{F}$: $\mathcal{A} \Rightarrow \mathcal{B} \Rightarrow \mathcal{C} \Rightarrow \mathcal{D} \Rightarrow \mathcal{E} \Rightarrow \mathcal{F} \vdash \mathcal{A} \vdash \mathcal{B} \vdash \mathcal{C} \vdash \mathcal{D} \vdash \mathcal{E} \vdash \mathcal{F}$]

SystemQ **proof of** MP5:

L01: Arbitrary $\gg$ $\mathcal{A},\mathcal{B},\mathcal{C},\mathcal{D},\mathcal{E},\mathcal{F}$;
L02: Premise $\gg$ $\mathcal{A} \Rightarrow \mathcal{B} \Rightarrow \mathcal{C} \Rightarrow \mathcal{D} \Rightarrow \mathcal{E} \Rightarrow \mathcal{F}$;
L03: Premise $\gg$ $\mathcal{A}$;
L04: Premise $\gg$ $\mathcal{B}$;

L05: Premise $\gg$ $\mathcal{C}$;

L06: Premise $\gg$ $\mathcal{D}$;

L07: Premise $\gg$ $\mathcal{E}$;

L08: MP3 $\rhd$ L02 $\rhd$ L03 $\rhd$ L04 $\rhd$ L05 $\gg$ $\mathcal{D} \Rightarrow \mathcal{E} \Rightarrow \mathcal{F}$;

L09: MP2 $\rhd$ L08 $\rhd$ L06 $\rhd$ L07 $\gg$ $\mathcal{F}$ $\square$

[SystemQ **lemma** AutoImply: $\Pi\mathcal{A}\colon \mathcal{A} \Rightarrow \mathcal{A}$]

SystemQ **proof of** AutoImply:

L01: Block $\gg$ Begin ;

L02: Arbitrary $\gg$ $\mathcal{A}$;

L03: Premise $\gg$ $\mathcal{A}$;

L04: Repetition $\rhd$ L03 $\gg$ $\mathcal{A}$;

L05: Block $\gg$ End ;

L06: Arbitrary $\gg$ $\mathcal{A}$;

L07: Ded $\rhd$ L05 $\gg$ $\mathcal{A} \Rightarrow \mathcal{A}$ $\square$

[SystemQ **lemma** ImplyTransitivity: $\Pi\mathcal{A},\mathcal{B},\mathcal{C}\colon \mathcal{A} \Rightarrow \mathcal{B} \vdash \mathcal{B} \Rightarrow \mathcal{C} \vdash \mathcal{A} \Rightarrow \mathcal{C}$]

SystemQ **proof of** ImplyTransitivity:

L01: Block $\gg$ Begin ;

L02: Arbitrary $\gg$ $\mathcal{A},\mathcal{B},\mathcal{C}$;

L03: Premise $\gg$ $\mathcal{A} \Rightarrow \mathcal{B}$;

L04: Premise $\gg$ $\mathcal{B} \Rightarrow \mathcal{C}$;

L05: Premise $\gg$ $\mathcal{A}$;

L06: MP $\rhd$ L03 $\rhd$ L05 $\gg$ $\mathcal{B}$;

L07: MP $\rhd$ L04 $\rhd$ L06 $\gg$ $\mathcal{C}$;

L08: Block $\gg$ End ;

L09: Arbitrary $\gg$ $\mathcal{A},\mathcal{B},\mathcal{C}$;

L10: Premise $\gg$ $\mathcal{A} \Rightarrow \mathcal{B}$;

L11: Premise $\gg$ $\mathcal{B} \Rightarrow \mathcal{C}$;

L12: Ded $\rhd$ L08 $\gg$ $(\mathcal{A} \Rightarrow \mathcal{B}) \Rightarrow (\mathcal{B} \Rightarrow \mathcal{C}) \Rightarrow \mathcal{A} \Rightarrow \mathcal{C}$;

L13: MP2 $\rhd$ L12 $\rhd$ L10 $\rhd$ L11 $\gg$ $\mathcal{A} \Rightarrow \mathcal{C}$ $\square$

[SystemQ **lemma** Weakening: $\Pi\mathcal{A},\mathcal{B}\colon \mathcal{B} \vdash \mathcal{A} \Rightarrow \mathcal{B}$]

SystemQ **proof of** Weakening:

L01: Block $\gg$ Begin ;

L02: Arbitrary $\gg$ $\mathcal{A},\mathcal{B}$;

L03: Premise $\gg$ $\mathcal{B}$;

L04: Premise $\gg$ $\mathcal{A}$;

L05: Repetition $\rhd$ L03 $\gg$ $\mathcal{B}$;

L06: Block $\gg$ End ;

L07: Arbitrary $\gg$ $\mathcal{A},\mathcal{B}$;

L08: Ded $\rhd$ L06 $\gg$ $\mathcal{B} \Rightarrow \mathcal{A} \Rightarrow \mathcal{B}$;

L09: Premise $\gg$ $\mathcal{B}$;

L10: MP $\rhd$ L08 $\rhd$ L09 $\gg$ $\mathcal{A} \Rightarrow \mathcal{B}$ $\square$

[SystemQ **lemma** FromContradiction: $\Pi\mathcal{A},\mathcal{B}\colon \mathcal{A} \vdash \dot\neg(\mathcal{A})\mathrm{n} \vdash \mathcal{B}$]

SystemQ **proof of** FromContradiction:

L01: Arbitrary $\gg$ $\mathcal{A},\mathcal{B}$;

L02: Premise $\gg$ $\mathcal{A}$;

L03: Premise $\gg$ $\dot\neg(\mathcal{A})\mathrm{n}$;

L04: Weakening $\rhd$ L02 $\gg$ $\dot{\neg}(\mathcal{B})\mathrm{n} \Rightarrow \mathcal{A}$;

L05: Weakening $\rhd$ L03 $\gg$ $\dot{\neg}(\mathcal{B})\mathrm{n} \Rightarrow \dot{\neg}(\mathcal{A})\mathrm{n}$;

L06: Neg $\rhd$ L04 $\rhd$ L05 $\gg$ $\mathcal{B}$ $\square$

[SystemQ **lemma** RemoveDoubleNeg: $\Pi\mathcal{A}\colon \dot{\neg}(\dot{\neg}(\mathcal{A})\mathrm{n})\mathrm{n} \vdash \mathcal{A}$]

SystemQ **proof of** RemoveDoubleNeg:

L01: Arbitrary $\gg$ $\mathcal{A}$;

L02: Premise $\gg$ $\dot{\neg}(\dot{\neg}(\mathcal{A})\mathrm{n})\mathrm{n}$;

L03: Weakening $\rhd$ L02 $\gg$ $\dot{\neg}(\mathcal{A})\mathrm{n} \Rightarrow \dot{\neg}(\dot{\neg}(\mathcal{A})\mathrm{n})\mathrm{n}$;

L04: AutoImply $\gg$ $\dot{\neg}(\mathcal{A})\mathrm{n} \Rightarrow \dot{\neg}(\mathcal{A})\mathrm{n}$;

L05: Neg $\rhd$ L04 $\rhd$ L03 $\gg$ $\mathcal{A}$ $\square$

[SystemQ **lemma** AddDoubleNeg: $\Pi\mathcal{A}\colon \mathcal{A} \vdash \dot{\neg}(\dot{\neg}(\mathcal{A})\mathrm{n})\mathrm{n}$]

SystemQ **proof of** AddDoubleNeg:

L01: Block $\gg$ Begin ;

L02: Arbitrary $\gg$ $\mathcal{A}$;

L03: Premise $\gg$ $\dot{\neg}(\dot{\neg}(\dot{\neg}(\mathcal{A})\mathrm{n})\mathrm{n})\mathrm{n}$;

L04: RemoveDoubleNeg $\rhd$ L03 $\gg$ $\dot{\neg}(\mathcal{A})\mathrm{n}$;

L05: Block $\gg$ End ;

L06: Arbitrary $\gg$ $\mathcal{A}$;

L07: Ded $\rhd$ L05 $\gg$ $\dot{\neg}(\dot{\neg}(\dot{\neg}(\mathcal{A})\mathrm{n})\mathrm{n})\mathrm{n} \Rightarrow \dot{\neg}(\mathcal{A})\mathrm{n}$;

L08: Premise $\gg$ $\mathcal{A}$;

L09: Weakening $\rhd$ L08 $\gg$ $\dot{\neg}(\dot{\neg}(\dot{\neg}(\mathcal{A})\mathrm{n})\mathrm{n})\mathrm{n} \Rightarrow \mathcal{A}$;

L10: Neg $\rhd$ L09 $\rhd$ L07 $\gg$ $\dot{\neg}(\dot{\neg}(\mathcal{A})\mathrm{n})\mathrm{n}$ $\square$

——(10.12.06)

[SystemQ **lemma** Technicality: $\Pi\mathcal{A},\mathcal{B}\colon \mathcal{A} \Rightarrow \mathcal{B} \vdash \dot{\neg}(\dot{\neg}(\mathcal{A})\mathrm{n})\mathrm{n} \Rightarrow \mathcal{B}$]

SystemQ **proof of** Technicality:

L01: Block $\gg$ Begin ;

L02: Arbitrary $\gg$ $\mathcal{A},\mathcal{B}$;

L03: Premise $\gg$ $\mathcal{A} \Rightarrow \mathcal{B}$;

L04: Premise $\gg$ $\dot{\neg}(\dot{\neg}(\mathcal{A})\mathrm{n})\mathrm{n}$;

L05: RemoveDoubleNeg $\rhd$ L04 $\gg$ $\mathcal{A}$;

L06: MP $\rhd$ L03 $\rhd$ L05 $\gg$ $\mathcal{B}$;

L07: Block $\gg$ End ;

L08: Arbitrary $\gg$ $\mathcal{A},\mathcal{B}$;

L09: Ded $\rhd$ L07 $\gg$ $(\mathcal{A} \Rightarrow \mathcal{B}) \Rightarrow \dot{\neg}(\dot{\neg}(\mathcal{A})\mathrm{n})\mathrm{n} \Rightarrow \mathcal{B}$;

L10: Premise $\gg$ $\mathcal{A} \Rightarrow \mathcal{B}$;

L11: MP $\rhd$ L09 $\rhd$ L10 $\gg$ $\dot{\neg}(\dot{\neg}(\mathcal{A})\mathrm{n})\mathrm{n} \Rightarrow \mathcal{B}$ $\square$

[SystemQ **lemma** NegativeMT: $\Pi\mathcal{A},\mathcal{B}\colon \dot{\neg}(\mathcal{A})\mathrm{n} \Rightarrow \mathcal{B} \vdash \dot{\neg}(\mathcal{B})\mathrm{n} \vdash \mathcal{A}$]

SystemQ **proof of** NegativeMT:

L01: Arbitrary $\gg$ $\mathcal{A},\mathcal{B}$;

L02: Premise $\gg$ $\dot{\neg}(\mathcal{A})\mathrm{n} \Rightarrow \mathcal{B}$;

L03: Premise $\gg$ $\dot{\neg}(\mathcal{B})\mathrm{n}$;

L04: Weakening $\rhd$ L03 $\gg$ $\dot{\neg}(\mathcal{A})\mathrm{n} \Rightarrow \dot{\neg}(\mathcal{B})\mathrm{n}$;

L05: Neg $\rhd$ L02 $\rhd$ L04 $\gg$ $\mathcal{A}$ $\square$

[SystemQ **lemma** MT: $\Pi\mathcal{A},\mathcal{B}\colon \mathcal{A} \Rightarrow \mathcal{B} \vdash \dot{\neg}(\mathcal{B})\mathrm{n} \vdash \dot{\neg}(\mathcal{A})\mathrm{n}$]

SystemQ **proof of** MT:

L01: Arbitrary $\gg$ $\mathcal{A},\mathcal{B}$;

L02:	Premise $\gg$	$\mathcal{A} \Rightarrow \mathcal{B}$	;
L03:	Premise $\gg$	$\dot{\neg}(\mathcal{B})\mathrm{n}$	;
L04:	Technicality $\gg$	$\dot{\neg}(\dot{\neg}(\mathcal{A})\mathrm{n})\mathrm{n} \Rightarrow \mathcal{B}$	;
L05:	NegativeMT $\rhd$ L04 $\rhd$ L03 $\gg$	$\dot{\neg}(\mathcal{A})\mathrm{n}$	□

[SystemQ **lemma** Contrapositive: $\Pi\mathcal{A},\mathcal{B}\colon \mathcal{A} \Rightarrow \mathcal{B} \vdash \dot{\neg}(\mathcal{B})\mathrm{n} \Rightarrow \dot{\neg}(\mathcal{A})\mathrm{n}$]

SystemQ **proof of** Contrapositive:

L01:	Block $\gg$	Begin	;
L02:	Arbitrary $\gg$	$\mathcal{A},\mathcal{B}$	;
L03:	Premise $\gg$	$\mathcal{A} \Rightarrow \mathcal{B}$	;
L04:	Premise $\gg$	$\dot{\neg}(\mathcal{B})\mathrm{n}$	;
L05:	MT $\rhd$ L03 $\rhd$ L04 $\gg$	$\dot{\neg}(\mathcal{A})\mathrm{n}$	;
L06:	Block $\gg$	End	;
L07:	Arbitrary $\gg$	$\mathcal{A},\mathcal{B}$	;
L08:	Premise $\gg$	$\mathcal{A} \Rightarrow \mathcal{B}$	;
L09:	Ded $\rhd$ L06 $\gg$	$(\mathcal{A} \Rightarrow \mathcal{B}) \Rightarrow \dot{\neg}(\mathcal{B})\mathrm{n} \Rightarrow \dot{\neg}(\mathcal{A})\mathrm{n}$	;
L10:	MP $\rhd$ L09 $\rhd$ L08 $\gg$	$\dot{\neg}(\mathcal{B})\mathrm{n} \Rightarrow \dot{\neg}(\mathcal{A})\mathrm{n}$	□

[SystemQ **lemma** JoinConjuncts: $\Pi\mathcal{A},\mathcal{B}\colon \mathcal{A} \vdash \mathcal{B} \vdash \mathcal{A} \dot{\wedge} \mathcal{B}$]

SystemQ **proof of** JoinConjuncts:

L01:	Block $\gg$	Begin	;
L02:	Arbitrary $\gg$	$\mathcal{A},\mathcal{B}$	;
L03:	Premise $\gg$	$\mathcal{A}$	;
L04:	Premise $\gg$	$\mathcal{A} \Rightarrow \dot{\neg}(\mathcal{B})\mathrm{n}$	;
L05:	MP $\rhd$ L04 $\rhd$ L03 $\gg$	$\dot{\neg}(\mathcal{B})\mathrm{n}$	;
L06:	Block $\gg$	End	;
L07:	Arbitrary $\gg$	$\mathcal{A},\mathcal{B}$	;
L08:	Ded $\rhd$ L06 $\gg$	$\mathcal{A} \Rightarrow (\mathcal{A} \Rightarrow \dot{\neg}(\mathcal{B})\mathrm{n}) \Rightarrow \dot{\neg}(\mathcal{B})\mathrm{n}$	;
L09:	Premise $\gg$	$\mathcal{A}$	;
L10:	Premise $\gg$	$\mathcal{B}$	;
L11:	MP $\rhd$ L08 $\rhd$ L09 $\gg$	$(\mathcal{A} \Rightarrow \dot{\neg}(\mathcal{B})\mathrm{n}) \Rightarrow \dot{\neg}(\mathcal{B})\mathrm{n}$	;
L12:	AddDoubleNeg $\rhd$ L10 $\gg$	$\dot{\neg}(\dot{\neg}(\mathcal{B})\mathrm{n})\mathrm{n}$	;
L13:	MT $\rhd$ L11 $\rhd$ L12 $\gg$	$\dot{\neg}((\mathcal{A} \Rightarrow \dot{\neg}(\mathcal{B})\mathrm{n}))\mathrm{n}$	;
L14:	Repetition $\rhd$ L13 $\gg$	$\mathcal{A} \dot{\wedge} \mathcal{B}$	□

[SystemQ **lemma** SecondConjunct: $\Pi\mathcal{A},\mathcal{B}\colon \mathcal{A} \dot{\wedge} \mathcal{B} \vdash \mathcal{B}$]

SystemQ **proof of** SecondConjunct:

L01:	Block $\gg$	Begin	;
L02:	Arbitrary $\gg$	$\mathcal{A},\mathcal{B}$	;
L03:	Premise $\gg$	$\dot{\neg}(\mathcal{B})\mathrm{n}$	;
L04:	Weakening $\rhd$ L03 $\gg$	$\mathcal{A} \Rightarrow \dot{\neg}(\mathcal{B})\mathrm{n}$	;
L05:	Block $\gg$	End	;
L06:	Arbitrary $\gg$	$\mathcal{A},\mathcal{B}$	;
L07:	Ded $\rhd$ L05 $\gg$	$\dot{\neg}(\mathcal{B})\mathrm{n} \Rightarrow \mathcal{A} \Rightarrow \dot{\neg}(\mathcal{B})\mathrm{n}$	;
L08:	Premise $\gg$	$\mathcal{A} \dot{\wedge} \mathcal{B}$	;
L09:	Repetition $\rhd$ L08 $\gg$	$\dot{\neg}((\mathcal{A} \Rightarrow \dot{\neg}(\mathcal{B})\mathrm{n}))\mathrm{n}$	;
L10:	NegativeMT $\rhd$ L07 $\rhd$ L09 $\gg$	$\mathcal{B}$	□

——(10.12.06)

[SystemQ **lemma** AndCommutativity: $\Pi\mathcal{A},\mathcal{B}\colon \mathcal{A} \dot{\wedge} \mathcal{B} \vdash \mathcal{B} \dot{\wedge} \mathcal{A}$]

SystemQ **proof of** AndCommutativity:

L01:	Block $\gg$	Begin	;
L02:	Arbitrary $\gg$	$\mathcal{A}, \mathcal{B}$	;
L03:	Premise $\gg$	$\mathcal{B} \Rightarrow \dot\neg\,(\mathcal{A})\mathrm{n}$	;
L04:	Premise $\gg$	$\mathcal{A}$	;
L05:	AddDoubleNeg $\rhd$ L04 $\gg$	$\dot\neg\,(\dot\neg\,(\mathcal{A})\mathrm{n})\mathrm{n}$	;
L06:	MT $\rhd$ L03 $\rhd$ L05 $\gg$	$\dot\neg\,(\mathcal{B})\mathrm{n}$	;
L07:	Block $\gg$	End	;
L08:	Arbitrary $\gg$	$\mathcal{A}, \mathcal{B}$	;
L09:	Ded $\rhd$ L07 $\gg$	$(\mathcal{B} \Rightarrow \dot\neg\,(\mathcal{A})\mathrm{n}) \Rightarrow \mathcal{A} \Rightarrow \dot\neg\,(\mathcal{B})\mathrm{n}$	;
L10:	Premise $\gg$	$\mathcal{A} \dot\wedge \mathcal{B}$	;
L11:	Repetition $\gg$	$\dot\neg\,((\mathcal{A} \Rightarrow \dot\neg\,(\mathcal{B})\mathrm{n}))\mathrm{n}$	;
L12:	MT $\rhd$ L09 $\rhd$ L11 $\gg$	$\dot\neg\,((\mathcal{B} \Rightarrow \dot\neg\,(\mathcal{A})\mathrm{n}))\mathrm{n}$	;
L13:	Repetition $\rhd$ L12 $\gg$	$\mathcal{B} \dot\wedge \mathcal{A}$	$\Box$

[SystemQ **lemma** FirstConjunct: $\Pi\mathcal{A}, \mathcal{B}\colon \mathcal{A} \dot\wedge \mathcal{B} \vdash \mathcal{A}$]

SystemQ **proof of** FirstConjunct:

L01:	Arbitrary $\gg$	$\mathcal{A}, \mathcal{B}$	;
L02:	Premise $\gg$	$\mathcal{A} \dot\wedge \mathcal{B}$	;
L03:	AndCommutativity $\rhd$ L02 $\gg$	$\mathcal{B} \dot\wedge \mathcal{A}$	;
L04:	SecondConjunct $\rhd$ L03 $\gg$	$\mathcal{A}$	$\Box$

[SystemQ **lemma** IffFirst: $\Pi\mathcal{A}, \mathcal{B}\colon \mathcal{A} \dot\Leftrightarrow \mathcal{B} \vdash \mathcal{B} \vdash \mathcal{A}$]

SystemQ **proof of** IffFirst:

L01:	Arbitrary $\gg$	$\mathcal{A}, \mathcal{B}$	;
L02:	Premise $\gg$	$\mathcal{A} \dot\Leftrightarrow \mathcal{B}$	;
L03:	Premise $\gg$	$\mathcal{B}$	;
L04:	SecondConjunct $\rhd$ L02 $\gg$	$\mathcal{B} \Rightarrow \mathcal{A}$	;
L05:	MP $\rhd$ L04 $\rhd$ L03 $\gg$	$\mathcal{A}$	$\Box$

[SystemQ **lemma** IffSecond: $\Pi\mathcal{A}, \mathcal{B}\colon \mathcal{A} \dot\Leftrightarrow \mathcal{B} \vdash \mathcal{A} \vdash \mathcal{B}$]

SystemQ **proof of** IffSecond:

L01:	Arbitrary $\gg$	$\mathcal{A}, \mathcal{B}$	;
L02:	Premise $\gg$	$\mathcal{A} \dot\Leftrightarrow \mathcal{B}$	;
L03:	Premise $\gg$	$\mathcal{A}$	;
L04:	FirstConjunct $\rhd$ L02 $\gg$	$\mathcal{A} \Rightarrow \mathcal{B}$	;
L05:	MP $\rhd$ L04 $\rhd$ L03 $\gg$	$\mathcal{B}$	$\Box$

[SystemQ **lemma** IffCommutativity: $\Pi\mathcal{A}, \mathcal{B}\colon \mathcal{A} \dot\Leftrightarrow \mathcal{B} \vdash \mathcal{B} \dot\Leftrightarrow \mathcal{A}$]

SystemQ **proof of** IffCommutativity:

L01:	Arbitrary $\gg$	$\mathcal{A}, \mathcal{B}$	;
L02:	Premise $\gg$	$\mathcal{A} \dot\Leftrightarrow \mathcal{B}$	;
L03:	Repetition $\rhd$ L02 $\gg$	$(\mathcal{A} \Rightarrow \mathcal{B}) \dot\wedge (\mathcal{B} \Rightarrow \mathcal{A})$	;
L04:	AndCommutativity $\rhd$ L03 $\gg$	$(\mathcal{B} \Rightarrow \mathcal{A}) \dot\wedge (\mathcal{A} \Rightarrow \mathcal{B})$	;
L05:	Repetition $\rhd$ L04 $\gg$	$\mathcal{B} \dot\Leftrightarrow \mathcal{A}$	$\Box$

—-(10.12.06)

[SystemQ **lemma** WeakenOr1: $\Pi\mathcal{A}, \mathcal{B}\colon \mathcal{B} \vdash \mathcal{A} \dot\vee \mathcal{B}$]

SystemQ **proof of** WeakenOr1:

L01:	Arbitrary $\gg$	$\mathcal{A}, \mathcal{B}$	;
L02:	Premise $\gg$	$\mathcal{B}$	;

L03: Weakening $\triangleright$ L02 $\gg$ $\dot{\neg}(\mathcal{A})\mathrm{n} \Rightarrow \mathcal{B}$;
L04: Repetition $\triangleright$ L03 $\gg$ $\mathcal{A} \dot{\vee} \mathcal{B}$ $\square$

[SystemQ **lemma** WeakenOr2: $\Pi\mathcal{A},\mathcal{B}$: $\mathcal{A} \vdash \mathcal{A} \dot{\vee} \mathcal{B}$]

SystemQ **proof of** WeakenOr2:

L01: Block $\gg$ Begin ;
L02: Arbitrary $\gg$ $\mathcal{A},\mathcal{B}$;
L03: Premise $\gg$ $\mathcal{A}$;
L04: Premise $\gg$ $\dot{\neg}(\mathcal{A})\mathrm{n}$;
L05: FromContradiction $\triangleright$ L03 $\triangleright$ L04 $\gg$ $\mathcal{B}$;
L06: Block $\gg$ End ;
L07: Arbitrary $\gg$ $\mathcal{A},\mathcal{B}$;
L08: Ded $\triangleright$ L06 $\gg$ $\mathcal{A} \Rightarrow \dot{\neg}(\mathcal{A})\mathrm{n} \Rightarrow \mathcal{B}$;
L09: Premise $\gg$ $\mathcal{A}$;
L10: MP $\triangleright$ L08 $\triangleright$ L09 $\gg$ $\dot{\neg}(\mathcal{A})\mathrm{n} \Rightarrow \mathcal{B}$;
L11: Repetition $\triangleright$ L10 $\gg$ $\mathcal{A} \dot{\vee} \mathcal{B}$ $\square$

[SystemQ **lemma** FromDisjuncts: $\Pi\mathcal{A},\mathcal{B},\mathcal{C}$: $\mathcal{A} \dot{\vee} \mathcal{B} \vdash \mathcal{A} \Rightarrow \mathcal{C} \vdash \mathcal{B} \Rightarrow \mathcal{C} \vdash \mathcal{C}$]

SystemQ **proof of** FromDisjuncts:

L01: Arbitrary $\gg$ $\mathcal{A},\mathcal{B},\mathcal{C}$;
L02: Premise $\gg$ $\mathcal{A} \dot{\vee} \mathcal{B}$;
L03: Premise $\gg$ $\mathcal{A} \Rightarrow \mathcal{C}$;
L04: Premise $\gg$ $\mathcal{B} \Rightarrow \mathcal{C}$;
L05: Repetition $\triangleright$ L02 $\gg$ $\dot{\neg}(\mathcal{A})\mathrm{n} \Rightarrow \mathcal{B}$;
L06: Contrapositive $\triangleright$ L05 $\gg$ $\dot{\neg}(\mathcal{B})\mathrm{n} \Rightarrow \dot{\neg}(\dot{\neg}(\mathcal{A})\mathrm{n})\mathrm{n}$;
L07: Technicality $\triangleright$ L03 $\gg$ $\dot{\neg}(\dot{\neg}(\mathcal{A})\mathrm{n})\mathrm{n} \Rightarrow \mathcal{C}$;
L08: ImplyTransitivity$\triangleright$L06$\triangleright$L07 $\gg$ $\dot{\neg}(\mathcal{B})\mathrm{n} \Rightarrow \mathcal{C}$;
L09: Contrapositive $\triangleright$ L08 $\gg$ $\dot{\neg}(\mathcal{C})\mathrm{n} \Rightarrow \dot{\neg}(\dot{\neg}(\mathcal{B})\mathrm{n})\mathrm{n}$;
L10: Contrapositive $\triangleright$ L04 $\gg$ $\dot{\neg}(\mathcal{C})\mathrm{n} \Rightarrow \dot{\neg}(\mathcal{B})\mathrm{n}$;
L11: Neg $\triangleright$ L10 $\triangleright$ L09 $\gg$ $\mathcal{C}$ $\square$

[SystemQ **rule** NumericalF: ΠFX: $(0\mathrm{f} \leq_{\mathrm{f}} \mathrm{FX} \Rightarrow |\mathrm{fFX}| = \mathrm{FX}) \dot{\wedge} (\dot{\neg}(0\mathrm{f} \leq_{\mathrm{f}} \mathrm{FX})\mathrm{n} \Rightarrow |\mathrm{fFX}| = -_{\mathrm{f}}\mathrm{FX})$]

$([|\mathsf{rx}| \stackrel{\text{macro}}{\to} \lambda\mathsf{t}.\lambda\mathsf{s}.\lambda\mathsf{c}.||\mathrm{Macro}(\mathsf{t}^{\mathrm{h}} :: \mathrm{ExpandList}(\mathsf{t}^{\mathrm{t}},\mathsf{s},\mathsf{c}))])^{\mathbf{p}}$

$[||\mathrm{Macro}(\mathsf{t}) \stackrel{\text{val}}{\to} \tilde{\mathcal{Q}}(\mathsf{t}, \lceil \mathrm{R}(|\mathrm{f}\mathsf{x}|)\rceil, (\lceil \mathsf{x} \rceil :: \mathrm{extractSeries}(\mathsf{t}^1)) :: \mathsf{T})]$

—–(11.12.06)

[SystemQ **rule** (Adgic)SameR: ΠFX, FY: FX = FY $\vdash$ R(FX) = R(FY)]

——-(11.12.06)

$([01//\mathrm{tempx} \stackrel{\text{macro}}{\to} \lambda\mathsf{t}.\lambda\mathsf{s}.\lambda\mathsf{c}.01//\mathrm{Macro}(\mathsf{t}^{\mathrm{h}} :: \mathrm{ExpandList}(\mathsf{t}^{\mathrm{t}},\mathsf{s},\mathsf{c}))])^{\mathbf{p}}$

$[01//\mathrm{Macro}(\mathsf{t}) \stackrel{\text{val}}{\to} \tilde{\mathcal{Q}}(\mathsf{t}, \lceil \mathrm{R}(1\mathrm{f}/\mathsf{x})\rceil, (\lceil \mathsf{x} \rceil :: \mathrm{extractSeries}(\mathsf{t}^1)) :: \mathsf{T})]$

venter——-

Priority table

Preassociative

[kvanti], [base], [bracket ∗ end bracket], [big bracket ∗ end bracket], [\$ ∗ \$], [**flush left** [∗]], [x], [y], [z], [[∗ ⋈ ∗]], [[∗ $\stackrel{*}{\to}$ ∗]], [pyk], [tex], [name], [prio], [∗], [T],

[if$(*,*,*)$], [$[* \stackrel{*}{\Rightarrow} *]$], [val], [claim], [$\bot$], [f$(*)$], [$(*)^{\mathrm{I}}$], [$\mathsf{F}$], [$\underline{0}$], [$\underline{1}$], [$\underline{2}$], [$\underline{3}$], [$\underline{4}$], [$\underline{5}$], [$\underline{6}$],
[$\underline{7}$], [$\underline{8}$], [$\underline{9}$], [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], [$(*)^{\mathrm{M}}$], [If$(*,*,*)$],
[array$\{*\} *$ end array], [l], [c], [r], [empty], [$\langle * \mid * := * \rangle$], [$\mathcal{M}(*)$], [$\tilde{\mathcal{U}}(*)$], [$\mathcal{U}(*)$],
[$\mathcal{U}^{\mathrm{M}}(*)$], [$\mathbf{apply}(*,*)$], [$\mathbf{apply}_1(*,*)$], [identifier$(*)$], [identifier$_1(*,*)$], [array-plus$(*,*)$], [array-remove$(*,*,*)$], [array-put$(*,*,*,*)$], [array-add$(*,*,*,*,*)$],
[bit$(*,*)$], [bit$_1(*,*)$], [rack], ["vector"], ["bibliography"], ["dictionary"],
["body"], ["codex"], ["expansion"], ["code"], ["cache"], ["diagnose"], ["pyk"],
["tex"], ["texname"], ["value"], ["message"], ["macro"], ["definition"],
["unpack"], ["claim"], ["priority"], ["lambda"], ["apply"], ["true"], ["if"],
["quote"], ["proclaim"], ["define"], ["introduce"], ["hide"], ["pre"], ["post"],
[$\mathcal{E}(*,*,*)$], [$\mathcal{E}_2(*,*,*,*,*)$], [$\mathcal{E}_3(*,*,*,*)$], [$\mathcal{E}_4(*,*,*,*)$], [$\mathbf{lookup}(*,*,*)$],
[$\mathbf{abstract}(*,*,*,*)$], [$[\lceil *]$], [$\mathcal{M}(*,*,*)$], [$\mathcal{M}_2(*,*,*,*)$], [$\mathcal{M}^*(*,*,*)$], [macro],
[s_0], [$\mathbf{zip}(*,*)$], [$\mathbf{assoc}_1(*,*,*)$], [$(*)^{\mathsf{P}}$], [self], [$[* \stackrel{..}{=} *]$], [$[* \doteq *]$], [$[* \acute{=} *]$],
[$[* \stackrel{\mathrm{pyk}}{=} *]$], [$[* \stackrel{\mathrm{tex}}{=} *]$], [$[* \stackrel{\mathrm{name}}{=} *]$], [$\mathbf{Priority\ table}[*]$], [$\tilde{\mathcal{M}}_1$], [$\tilde{\mathcal{M}}_2(*)$], [$\tilde{\mathcal{M}}_3(*)$],
[$\tilde{\mathcal{M}}_4(*,*,*,*)$], [$\tilde{\mathcal{M}}(*,*,*)$], [$\tilde{\mathcal{Q}}(*,*,*)$], [$\tilde{\mathcal{Q}}_2(*,*,*)$], [$\tilde{\mathcal{Q}}_3(*,*,*,*)$], [$\tilde{\mathcal{Q}}^*(*,*,*)$],
[$(*)$], [$(*)$], [display$(*)$], [statement$(*)$], [$[*]^{\cdot}$], [$[*]^{-}$], [$\mathbf{aspect}(*,*)$],
[$\mathbf{aspect}(*,*,*)$], [$\langle * \rangle$], [$\mathbf{tuple}_1(*)$], [$\mathbf{tuple}_2(*)$], [let$_2(*,*)$], [let$_1(*,*)$],
[$[* \stackrel{\mathrm{claim}}{=} *]$], [checker], [$\mathbf{check}(*,*)$], [$\mathbf{check}_2(*,*,*)$], [$\mathbf{check}_3(*,*,*)$],
[$\mathbf{check}^*(*,*)$], [$\mathbf{check}_2^*(*,*,*)$], [$[*]^{\cdot}$], [$[*]^{-}$], [$[*]^{\circ}$], [msg], [$[* \stackrel{\mathrm{msg}}{=} *]$], [<stmt>],
[stmt], [$[* \stackrel{\mathrm{stmt}}{=} *]$], [HeadNil$'$], [HeadPair$'$], [Transitivity$'$], [$\bot\!\!\bot$], [Contra$'$], [$\mathrm{T}'_{\mathrm{E}}$],
[L_1], [$\underline{*}$], [$\mathcal{A}$], [$\mathcal{B}$], [$\mathcal{C}$], [$\mathcal{D}$], [$\mathcal{E}$], [$\mathcal{F}$], [$\mathcal{G}$], [$\mathcal{H}$], [$\mathcal{I}$], [$\mathcal{J}$], [$\mathcal{K}$], [$\mathcal{L}$], [$\mathcal{M}$], [$\mathcal{N}$], [$\mathcal{O}$], [$\mathcal{P}$], [$\mathcal{Q}$],
[$\mathcal{R}$], [$\mathcal{S}$], [$\mathcal{T}$], [$\mathcal{U}$], [$\mathcal{V}$], [$\mathcal{W}$], [$\mathcal{X}$], [$\mathcal{Y}$], [$\mathcal{Z}$], [$\langle * \mid * := * \rangle$], [$\langle^* * \mid * := * \rangle$], [$\emptyset$], [Remainder],
[$(*)^{\mathsf{v}}$], [intro$(*,*,*,*)$], [intro$(*,*,*)$], [error$(*,*)$], [error$_2(*,*)$], [proof$(*,*,*)$],
[proof$_2(*,*)$], [$\mathcal{S}(*,*)$], [$\mathcal{S}^{\mathrm{I}}(*,*)$], [$\mathcal{S}^{\rhd}(*,*)$], [$\mathcal{S}_1^{\rhd}(*,*,*)$], [$\mathcal{S}^{\mathrm{E}}(*,*)$], [$\mathcal{S}_1^{\mathrm{E}}(*,*,*)$],
[$\mathcal{S}^{+}(*,*)$], [$\mathcal{S}_1^{+}(*,*,*)$], [$\mathcal{S}^{-}(*,*)$], [$\mathcal{S}_1^{-}(*,*,*)$], [$\mathcal{S}^{*}(*,*)$], [$\mathcal{S}_1^{*}(*,*,*)$],
[$\mathcal{S}_2^{*}(*,*,*,*)$], [$\mathcal{S}^{@}(*,*)$], [$\mathcal{S}_1^{@}(*,*,*)$], [$\mathcal{S}^{\vdash}(*,*)$], [$\mathcal{S}_1^{\vdash}(*,*,*,*)$], [$\mathcal{S}^{\Vdash}(*,*)$],
[$\mathcal{S}_1^{\Vdash}(*,*,*,*)$], [$\mathcal{S}^{\mathrm{i.e.}}(*,*)$], [$\mathcal{S}_1^{\mathrm{i.e.}}(*,*,*,*)$], [$\mathcal{S}_2^{\mathrm{i.e.}}(*,*,*,*,*)$], [$\mathcal{S}^{\forall}(*,*)$],
[$\mathcal{S}_1^{\forall}(*,*,*,*)$], [$\mathcal{S}^{;}(*,*)$], [$\mathcal{S}_1^{;}(*,*,*)$], [$\mathcal{S}_2^{;}(*,*,*,*)$], [$\mathcal{T}(*)$], [claims$(*,*,*)$],
[claims$_2(*,*,*)$], [<proof>], [proof], [[**Lemma** $*: *$]], [[**Proof of** $*: *$]],
[[$*$ **lemma** $*: *$]], [[$*$ **antilemma** $*: *$]], [[$*$ **rule** $*: *$]], [[$*$ **antirule** $*: *$]],
[verifier], [$\mathcal{V}_1(*)$], [$\mathcal{V}_2(*,*)$], [$\mathcal{V}_3(*,*,*,*)$], [$\mathcal{V}_4(*,*)$], [$\mathcal{V}_5(*,*,*,*)$], [$\mathcal{V}_6(*,*,*,*)$],
[$\mathcal{V}_7(*,*,*,*)$], [Cut$(*,*)$], [Head$_{\oplus}(*)$], [Tail$_{\oplus}(*)$], [rule$_1(*,*)$], [rule$(*,*)$],
[Rule tactic], [Plus$(*,*)$], [[**Theory** $*$]], [theory$_2(*,*)$], [theory$_3(*,*)$],
[theory$_4(*,*,*)$], [HeadNil$''$], [HeadPair$''$], [Transitivity$''$], [Contra$''$], [HeadNil],
[HeadPair], [Transitivity], [Contra], [T_{E}], [ragged right],
[ragged right expansion], [parm$(*,*,*)$], [parm$^*(*,*,*)$], [inst$(*,*)$],
[inst$^*(*,*)$], [occur$(*,*,*)$], [occur$^*(*,*,*)$], [unify$(* = *,*)$], [unify$^*(* = *,*)$],
[unify$_2(* = *,*)$], [L_{a}], [L_{b}], [L_{c}], [L_{d}], [L_{e}], [L_{f}], [L_{g}], [L_{h}], [L_{i}], [L_{j}], [L_{k}], [L_{l}], [L_{m}],
[L_{n}], [L_{o}], [L_{p}], [L_{q}], [L_{r}], [L_{s}], [L_{t}], [L_{u}], [L_{v}], [L_{w}], [L_{x}], [L_{y}], [L_{z}], [L_{A}], [L_{B}], [L_{C}],
[L_{D}], [L_{E}], [L_{F}], [L_{G}], [L_{H}], [L_{I}], [L_{J}], [L_{K}], [L_{L}], [L_{M}], [L_{N}], [L_{O}], [L_{P}], [L_{Q}], [L_{R}],
[L_{S}], [L_{T}], [L_{U}], [L_{V}], [L_{W}], [L_{X}], [L_{Y}], [L_{Z}], [$\mathrm{L}_{?}$], [Reflexivity], [Reflexivity$_1$],
[Commutativity], [Commutativity$_1$], [<tactic>], [tactic], [$[* \stackrel{\mathrm{tactic}}{=} *]$], [$\mathcal{P}(*,*,*)$],
[$\mathcal{P}^*(*,*,*)$], [p_0], [conclude$_1(*,*)$], [conclude$_2(*,*,*)$], [conclude$_3(*,*,*,*)$],

[conclude$_4(*,*)$], [check], [[$* \overset{\circ}{=} *$]], [RootVisible$(*)$], [A], [R], [C], [T], [L], [$\{*\}$], [$\overline{*}$], [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], [$\langle * \equiv * \mid * := * \rangle$], [$\langle * \equiv^0 * \mid * := * \rangle$], [$\langle * \equiv^1 * \mid * := * \rangle$], [$\langle * \equiv^* * \mid * := * \rangle$], [Ded$(*,*)$], [Ded$_0(*,*)$], [Ded$_1(*,*,*)$], [Ded$_2(*,*,*)$], [Ded$_3(*,*,*,*)$], [Ded$_4(*,*,*,*)$], [Ded$_4^*(*,*,*,*)$], [Ded$_5(*,*,*)$], [Ded$_6(*,*,*,*)$], [Ded$_6^*(*,*,*,*)$], [Ded$_7(*)$], [Ded$_8(*,*)$], [Ded$_8^*(*,*)$], [S], [Neg], [MP], [Gen], [Ded], [S1], [S2], [S3], [S4], [S5], [S6], [S7], [S8], [S9], [Repetition], [A1$'$], [A2$'$], [A4$'$], [A5$'$], [Prop 3.2a], [Prop 3.2b], [Prop 3.2c], [Prop 3.2d], [Prop 3.2e$_1$], [Prop 3.2e$_2$], [Prop 3.2e], [Prop 3.2f$_1$], [Prop 3.2f$_2$], [Prop 3.2f], [Prop 3.2g$_1$], [Prop 3.2g$_2$], [Prop 3.2g], [Prop 3.2h$_1$], [Prop 3.2h$_2$], [Prop 3.2h], [Block$_1(*,*,*)$], [Block$_2(*)$], [UniqueMember], [UniqueMember(Type)], [SameSeries], [A4], [SameMember], [Qclosed(Addition)], [Qclosed(Multiplication)], [FromCartProd(1)], [1rule fromCartProd(2)], [constantRationalSeries$(*)$], [cartProd$(*)$], [Power$(*)$], [binaryUnion$(*,*)$], [SetOfRationalSeries], [IsSubset$(*,*)$], [(p$*,*$)], [(s$*$)], [$(\cdots)$], [Objekt-var], [Ex-var], [Ph-var], [Værdi], [Variabel], [Op$(*)$], [Op$(*,*)$], [$* =\!\ddot{=}\!= *$], [ContainsEmpty$(*)$], [Nat$(*)$], [Dedu$(*,*)$], [Dedu$_0(*,*)$], [Dedu$_s(*,*,*)$], [Dedu$_1(*,*,*)$], [Dedu$_2(*,*,*)$], [Dedu$_3(*,*,*,*)$], [Dedu$_4(*,*,*,*)$], [Dedu$_4^*(*,*,*,*)$], [Dedu$_5(*,*,*)$], [Dedu$_6(*,*,*,*)$], [Dedu$_6^*(*,*,*,*)$], [Dedu$_7(*)$], [Dedu$_8(*,*)$], [Dedu$_8^*(*,*)$], [Ex$_1$], [Ex$_2$], [Ex3], [Ex$_{10}$], [Ex$_{20}$], [$*_{\mathrm{Ex}}$], [$*^{\mathrm{Ex}}$], [$\langle * \equiv * \mid * :=== * \rangle_{\mathrm{Ex}}$], [$\langle * \equiv^0 * \mid * :=== * \rangle_{\mathrm{Ex}}$], [$\langle * \equiv^1 * \mid * :=== * \rangle_{\mathrm{Ex}}$], [$\langle * \equiv^* * \mid * :=== * \rangle_{\mathrm{Ex}}$], [ph$_1$], [ph$_2$], [ph$_3$], [$*_{\mathrm{Ph}}$], [$*^{\mathrm{Ph}}$], [$\langle * \equiv * \mid * :=== * \rangle_{\mathrm{Ph}}$], [$\langle * \equiv^0 * \mid * :=== * \rangle_{\mathrm{Ph}}$], [$\langle * \equiv^1 * \mid * :=== * \rangle_{\mathrm{Ph}}$], [$\langle * \equiv^* * \mid * :=== * \rangle_{\mathrm{Ph}}$], [$\langle * \equiv * \mid * :=== * \rangle_{\mathrm{Me}}$], [$\langle * \equiv^1 * \mid * :=== * \rangle_{\mathrm{Me}}$], [$\langle * \equiv^* * \mid * :=== * \rangle_{\mathrm{Me}}$], [bs], [OBS], [$\mathcal{BS}$], [Ø], [SystemQ], [MP], [Gen], [Repetition], [Neg], [Ded], [ExistIntro], [Extensionality], [Ødef], [PairDef], [UnionDef], [PowerDef], [SeparationDef], [AddDoubleNeg], [RemoveDoubleNeg], [AndCommutativity], [AutoImply], [Contrapositive], [FirstConjunct], [SecondConjunct], [FromContradiction], [FromDisjuncts], [IffCommutativity], [IffFirst], [IffSecond], [ImplyTransitivity], [JoinConjuncts], [MP2], [MP3], [MP4], [MP5], [MT], [NegativeMT], [Technicality], [Weakening], [WeakenOr1], [WeakenOr2], [Formula2Pair], [Pair2Formula], [Formula2Union], [Union2Formula], [Formula2Sep], [Sep2Formula], [Formula2Power], [SubsetInPower], [HelperPowerIsSub], [PowerIsSub], [(Switch)HelperPowerIsSub], [(Switch)PowerIsSub], [ToSetEquality], [HelperToSetEquality(t)], [ToSetEquality(t)], [HelperFromSetEquality], [FromSetEquality], [HelperReflexivity], [Reflexivity], [HelperSymmetry], [Symmetry], [HelperTransitivity], [Transitivity], [ERisReflexive], [ERisSymmetric], [ERisTransitive], [ØisSubset], [HelperMemberNotØ], [MemberNotØ], [HelperUniqueØ], [UniqueØ], [==Reflexivity], [==Symmetry], [Helper==Transitivity], [==Transitivity], [HelperTransferNotEq], [TransferNotEq], [HelperPairSubset], [Helper(2)PairSubset], [PairSubset], [SamePair], [SameSingleton], [UnionSubset], [SameUnion], [SeparationSubset], [SameSeparation], [SameBinaryUnion], [IntersectionSubset], [SameIntersection], [AutoMember], [HelperEqSysNotØ], [EqSysNotØ], [HelperEqSubset], [EqSubset], [HelperEqNecessary], [EqNecessary], [HelperNoneEqNecessary], [Helper(2)NoneEqNecessary], [NoneEqNecessary], [EqClassIsSubset], [EqClassesAreDisjoint], [AllDisjoint], [AllDisjointImply], [BSsubset], [Union(BS/R)subset], [UnionIdentity], [EqSysIsPartition], [(x1)], [(x2)], [(y1)], [(y2)], [(v1)], [(v2)], [(v3)], [(v4)], [(v2n)], [(m1)], [(m2)], [(n1)], [(n2)], [(n3)], [(ϵ)], [(ϵ)$_1$], [(ϵ2)], [(fep)], [(fx)], [(fy)], [(fz)], [(fu)], [(fv)], [(fw)], [(rx)], [(ry)], [(rz)], [(ru)], [(sx)], [(sx1)], [(sy)], [(sy1)], [(sz)], [(sz1)], [(su)], [(su1)], [(fxs)], [(fys)], [(crs1)], [(f1)], [(f2)], [(f3)], [(f4)], [(op1)], [(op2)], [(r1)], [(s1)], [(s2)], [X_1], [X_2], [Y_1], [Y_2], [V_1], [V_2], [V_3], [V_4], [V_{2n}], [M_1], [M_2], [N_1], [N_2], [N_3], [ϵ], [ϵ1], [ϵ2], [FX], [FY], [FZ], [FU], [FV], [FW], [FEP], [RX], [RY], [RZ], [RU], [(SX)], [(SX1)], [(SY)], [(SY1)], [(SZ)], [(SZ1)], [(SU)], [(SU1)], [FXS], [FYS], [(F1)], [(F2)], [(F3)], [(F4)], [(OP1)], [(OP2)], [(R1)], [(S1)], [(S2)], [(EPob)], [(CRS1ob)], [(F1ob)], [(F2ob)], [(F3ob)], [(F4ob)], [(N1ob)], [(N2ob)], [(OP1ob)], [(OP2ob)], [(R1ob)], [(S1ob)], [(S2ob)], [ph_4], [ph_5], [ph_6], [NAT], [RATIONAL$_S$ERIES], [SERIES], [SetOfReals], [SetOfFxs], [N], [Q], [X], [xs], [xaF], [ysF], [us], [usFoelge], [0], [1], [(−1)], [2], [3], [1/2], [1/3], [2/3], [0f], [1f], [00], [01], [(− − 01)], [02], [01//02], [PlusAssociativity(R)], [PlusAssociativity(R)XX], [Plus0(R)], [Negative(R)], [Times1(R)], [lessAddition(R)], [PlusCommutativity(R)], [LeqAntisymmetry(R)], [LeqTransitivity(R)], [leqAddition(R)], [Distribution(R)], [A4(Axiom)], [InductionAxiom], [EqualityAxiom], [EqLeqAxiom], [EqAdditionAxiom], [EqMultiplicationAxiom], [QisClosed(Reciprocal)(Imply)], [QisClosed(Reciprocal)], [QisClosed(Negative)(Imply)], [QisClosed(Negative)], [leqReflexivity], [leqAntisymmetryAxiom], [leqTransitivityAxiom], [leqTotality], [leqAdditionAxiom], [leqMultiplicationAxiom], [plusAssociativity], [plusCommutativity], [Negative], [plus0], [timesAssociativity], [timesCommutativity], [ReciprocalAxiom], [times1], [Distribution], [0not1], [lemma eqLeq(R)], [TimesAssociativity(R)], [TimesCommutativity(R)], [(Adgic)SameR], [Separation2formula(1)], [Separation2formula(2)], [Cauchy], [PlusF], [ReciprocalF], [From ==], [To ==], [FromInR], [PlusR(Sym)], [ReciprocalR(Axiom)], [LessMinus1(N)], [Nonnegative(N)], [US0], [NextXS(UpperBound)], [NextXS(NoUpperBound)], [NextUS(UpperBound)], [NextUS(NoUpperBound)], [ExpZero], [ExpPositive], [ExpZero(R)], [ExpPositive(R)], [BSzero], [BSpositive], [UStelescope(Zero)], [UStelescope(Positive)], [EqAddition(R)], [FromLimit], [ToUpperBound], [FromUpperBound], [USisUpperBound], [0not1(R)], [ExpUnbounded(R)], [FromLeq(Advanced)(N)], [FromLeastUpperBound], [ToLeastUpperBound], [XSisNotUpperBound], [ysFGreater], [ysFLess], [SmallInverse], [NatType], [RationalType], [SeriesType], [Max], [Numerical], [NumericalF], [MemberOfSeries(Imply)], [JoinConjuncts(2conditions)], [prop lemma imply negation], [TND], [FromNegatedImply], [ToNegatedImply], [FromNegated(2 ∗ Imply)], [FromNegatedAnd], [FromNegatedOr], [ToNegatedOr], [FromNegations], [From3Disjuncts], [From2 ∗ 2Disjuncts], [NegateDisjunct1], [NegateDisjunct2], [ExpandDisjuncts], [SENC1], [SENC2], [LessLeq(R)], [MemberOfSeries], [memberOfSeries(Type)];

Preassociative

[∗_{∗}], [∗/indexintro(∗, ∗, ∗, ∗)], [∗/intro(∗, ∗, ∗)], [∗/bothintro(∗, ∗, ∗, ∗, ∗)], [∗/nameintro(∗, ∗, ∗, ∗)], [∗′], [∗[∗]], [∗[∗→∗]], [∗[∗⇒∗]], [∗0], [∗1], [0b], [∗-color(∗)],

[$*$-color$^*(*)$], [$*^{\mathrm{H}}$], [$*^{\mathrm{T}}$], [$*^{\mathrm{U}}$], [$*^{\mathrm{h}}$], [$*^{\mathrm{t}}$], [$*^{\mathrm{s}}$], [$*^{\mathrm{c}}$], [$*^{\mathrm{d}}$], [$*^{\mathrm{a}}$], [$*^{\mathrm{C}}$], [$*^{\mathrm{M}}$], [$*^{\mathrm{B}}$], [$*^{\mathrm{r}}$], [$*^{\mathrm{i}}$], [$*^{\mathrm{d}}$], [$*^{\mathrm{R}}$], [$*^{0}$], [$*^{1}$], [$*^{2}$], [$*^{3}$], [$*^{4}$], [$*^{5}$], [$*^{6}$], [$*^{7}$], [$*^{8}$], [$*^{9}$], [$*^{\mathrm{E}}$], [$*^{\mathcal{V}}$], [$*^{\mathcal{C}}$], [$*^{\mathcal{C}^*}$], [$*^{\mathrm{hide}}$];

Preassociative

[“ $*$ ”], [], [$(*)^{\mathbf{t}}$], [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

[$*$(exp)$*$];

Preassociative

[$*'$], [R($*$)], [$--$ R($*$)], [rec$*$];

Preassociative

[$*/*$], [$* \cap *$], [$*[*]$];

Preassociative

[$\cup *$], [$* \cup *$], [P($*$)];

Preassociative

[$\{*\}$], [StateExpand($*, *, *$)], [extractSeries($*$)], [SetOfSeries($*$)], [$--$ Macro($*$)], [ExpandList($*, *, *$)], [$**$ Macro($*$)], [$++$ Macro($*$)], [<< Macro($*$)], [||Macro($*$)], [01//Macro($*$)], [UB($*, *$)], [LUB($*, *$)], [BS($*, *$)], [UStelescope($*, *$)], [($*$)], [|f $*$ |], [|r $*$ |], [Limit($*, *$)], [Union($*$)], [IsOrderedPair($*, *, *$)], [IsRelation($*, *, *$)], [isFunction($*, *, *$)], [IsSeries($*, *$)], [IsNatural($*, *$)], [OrderedPair($*, *$)], [TypeNat($*$)], [TypeNat0($*$)], [TypeRational($*$)], [TypeRational0($*$)], [TypeSeries($*, *$)], [Typeseries0($*, *$)];

Preassociative

[$\{*, *\}$], [$\langle *, * \rangle$], [($-$u$*$)], [$-_{\mathrm{f}} *$], [($- - *$)], [1f/$*$], [01//temp$*$];

Preassociative

[$*(*, *)$], [ReflRel($*, *$)], [SymRel($*, *$)], [TransRel($*, *$)], [EqRel($*, *$)], [$[* \in *]_*$], [Partition($*, *$)];

Preassociative

[$* \cdot *$], [$* \cdot_0 *$], [$(* * *)$], [$* *_{\mathrm{f}} *$], [$* * **$];

Preassociative

[$* + *$], [$* +_0 *$], [$* +_1 *$], [$* - *$], [$* -_0 *$], [$* -_1 *$], [$(* + *)$], [$(* - *)$], [$* +_{\mathrm{f}} *$], [$* -_{\mathrm{f}} *$], [$* + + *$], [R($*$) $- -$R($*$)];

Preassociative

[$* \in *$];

Preassociative

[$| * |$], [if($*, *, *$)], [Max($*, *$)], [Max($*, *$)];

Preassociative

$[* = *], [* \neq *], [* <= *], [* < *], [* <_{\mathrm{f}} *], [* \leq_{\mathrm{f}} *], [\mathrm{SF}(*, *)], [* == *],$
$[*!! == *], [* << *], [* <<== *];$
Preassociative
$[* \cup \{*\}], [* \cup *], [*\backslash\{*\}];$
Postassociative
$[* \therefore *], [* \underline{\therefore} *], [* \underline{::} *], [* \underline{+2*} *], [* :: *], [* +2* *];$
Postassociative
$[*, *];$
Preassociative
$[* \stackrel{\mathrm{B}}{\approx} *], [* \stackrel{\mathrm{D}}{\approx} *], [* \stackrel{\mathrm{C}}{\approx} *], [* \stackrel{\mathrm{P}}{\approx} *], [* \approx *], [* = *], [* \stackrel{+}{\rightarrow} *], [* \stackrel{\mathrm{t}}{=} *], [* \stackrel{\mathrm{t}^*}{=} *], [* \stackrel{\mathrm{r}}{=} *],$
$[* \in_{\mathrm{t}} *], [* \subseteq_{\mathrm{T}} *], [* \stackrel{\mathrm{T}}{=} *], [* \stackrel{\mathrm{s}}{=} *], [* \text{ free in } *], [* \text{ free in}^* *], [* \text{ free for } * \text{ in } *],$
$[* \text{ free for}^* * \text{ in } *], [* \in_{\mathrm{c}} *], [* < *], [* <' *], [* \leq' *], [* = *], [* \neq *], [*^{\mathrm{var}}],$
$[*\#^0*], [*\#^1*], [*\#^**], [*==*], [* \subseteq *];$
Preassociative
$[\neg *], [\dot{\neg}\,(*)\mathrm{n}], [* \notin *], [* \neq *];$
Preassociative
$[* \wedge *], [* \ddot{\wedge} *], [* \tilde{\wedge} *], [* \wedge_{\mathrm{c}} *], [* \dot{\wedge} *];$
Preassociative
$[* \vee *], [* \parallel *], [* \ddot{\vee} *];$
Postassociative
$[* \dot{\vee} *];$
Preassociative
$[\exists *\colon *], [\forall *\colon *], [\forall_{\mathrm{obj}} *\colon *], [\exists *\colon *];$
Postassociative
$[* \ddot{\Rightarrow} *], [* \Rightarrow *], [* \Leftrightarrow *], [* \dot{\Leftrightarrow} *];$
Preassociative
$[\{\mathrm{ph} \in * \mid *\}];$
Postassociative
$[* : *], [* \text{ spy } *], [*!*];$
Preassociative
$[* \left\{ \begin{array}{c} * \\ * \end{array} \right.];$
Preassociative
$[\lambda * .*], [\Lambda * .*], [\Lambda *], [\mathbf{if}\ *\ \mathbf{then}\ *\ \mathbf{else}\ *], [\mathbf{let}\ * = * \ \mathbf{in}\ *], [\mathbf{let}\ * \stackrel{..}{=} *\ \text{ in }\ *];$
Preassociative
$[*\#*];$
Preassociative
$[*^{\mathrm{I}}], [*^{\triangleright}], [*^{\mathrm{V}}], [*^{+}], [*^{-}], [*^{*}];$
Preassociative
$[* @ *], [* \triangleright *], [* \gg\!\!\triangleright *], [* \gg *], [* \trianglerighteq *];$
Postassociative
$[* \vdash *], [* \Vdash *], [* \text{ i.e. } *];$
Preassociative
$[\forall *\colon *], [\Pi *\colon *];$
Postassociative

$[* \oplus *]$;
Postassociative
$[*; *]$;
Preassociative
[$*$ proves $*$];
Preassociative
[$*$ **proof of** $* : *$], [Line $* : * \gg *; *$], [Last line $* \gg * \square$],
[Line $*$: Premise $\gg *; *$], [Line $*$: Side-condition $\gg *; *$], [Arbitrary $\gg *; *$],
[Local $\gg * = *; *$], [Begin $*; *$: End; $*$], [Last block line $* \gg *$;],
[Arbitrary $\gg *; *$];
Postassociative
$[* \mid *]$;
Postassociative
[$*$, $*$], [$*$[$*$]$*$];
Preassociative
[$*$&$*$];
Preassociative
[$*$\\$*$], [$*$ linebreak[4] $*$], [$*$\\$*$]; **End table**

A Pyk definitioner

([UniqueMember $\stackrel{\text{pyk}}{\to}$ "lemma uniqueMember"]
[UniqueMember(Type) $\stackrel{\text{pyk}}{\to}$ "lemma uniqueMember(Type)"]
[SameSeries $\stackrel{\text{pyk}}{\to}$ "lemma sameSeries"]
[A4 $\stackrel{\text{pyk}}{\to}$ "lemma a4"]
[SameMember $\stackrel{\text{pyk}}{\to}$ "lemma sameMember"]
[Qclosed(Addition) $\stackrel{\text{pyk}}{\to}$ "1rule Qclosed(Addition)"]
[Qclosed(Multiplication) $\stackrel{\text{pyk}}{\to}$ "1rule Qclosed(Multiplication)"]
[FromCartProd(1) $\stackrel{\text{pyk}}{\to}$ "1rule fromCartProd(1)"]
[1rule fromCartProd(2) $\stackrel{\text{pyk}}{\to}$ "1rule fromCartProd(2)"]
[constantRationalSeries($*$) $\stackrel{\text{pyk}}{\to}$ "constantRationalSeries(")"]
[cartProd($*$) $\stackrel{\text{pyk}}{\to}$ "cartProd(" , ")"]
[Power($*$) $\stackrel{\text{pyk}}{\to}$ "P(")"]
[binaryUnion($*, *$) $\stackrel{\text{pyk}}{\to}$ "binaryUnion(" , ")"]
[SetOfRationalSeries $\stackrel{\text{pyk}}{\to}$ "setOfRationalSeries"]
[IsSubset($*, *$) $\stackrel{\text{pyk}}{\to}$ "isSubset(" , ")"]
[(p$*, *$) $\stackrel{\text{pyk}}{\to}$ "(p " , ")"]
[(s$*$) $\stackrel{\text{pyk}}{\to}$ "(s ")"]
[($\cdots$) $\stackrel{\text{pyk}}{\to}$ "cdots"]

[`Objekt-var` $\stackrel{\text{pyk}}{\to}$ "object-var"]

[`Ex-var` $\stackrel{\text{pyk}}{\to}$ "ex-var"]

[`Ph-var` $\stackrel{\text{pyk}}{\to}$ "ph-var"]

[`Værdi` $\stackrel{\text{pyk}}{\to}$ "vaerdi"]

[`Variabel` $\stackrel{\text{pyk}}{\to}$ "variabel"]

[$\mathrm{Op}(*)$ $\stackrel{\text{pyk}}{\to}$ "op " end op"]

[$\mathrm{Op}(*,*)$ $\stackrel{\text{pyk}}{\to}$ "op2 " comma " end op2"]

[$* \stackrel{..}{==} *$ $\stackrel{\text{pyk}}{\to}$ "define-equal " comma " end equal"]

[$\mathrm{ContainsEmpty}(*)$ $\stackrel{\text{pyk}}{\to}$ "contains-empty " end empty"]

[$\mathrm{Nat}(*)$ $\stackrel{\text{pyk}}{\to}$ "Nat(")"]

[$\mathrm{Dedu}(*,*)$ $\stackrel{\text{pyk}}{\to}$ "1deduction " conclude " end 1deduction"]

[$\mathrm{Dedu}_0(*,*)$ $\stackrel{\text{pyk}}{\to}$ "1deduction zero " conclude " end 1deduction"]

[$\mathrm{Dedu}_s(*,*,*)$ $\stackrel{\text{pyk}}{\to}$ "1deduction side " conclude " condition " end 1deduction"]

[$\mathrm{Dedu}_1(*,*,*)$ $\stackrel{\text{pyk}}{\to}$ "1deduction one " conclude " condition " end 1deduction"]

[$\mathrm{Dedu}_2(*,*,*)$ $\stackrel{\text{pyk}}{\to}$ "1deduction two " conclude " condition " end 1deduction"]

[$\mathrm{Dedu}_3(*,*,*,*)$ $\stackrel{\text{pyk}}{\to}$ "1deduction three " conclude " condition " bound " end 1deduction"]

[$\mathrm{Dedu}_4(*,*,*,*)$ $\stackrel{\text{pyk}}{\to}$ "1deduction four " conclude " condition " bound " end 1deduction"]

[$\mathrm{Dedu}_4^*(*,*,*,*)$ $\stackrel{\text{pyk}}{\to}$ "1deduction four star " conclude " condition " bound " end 1deduction"]

[$\mathrm{Dedu}_5(*,*,*)$ $\stackrel{\text{pyk}}{\to}$ "1deduction five " condition " bound " end 1deduction"]

[$\mathrm{Dedu}_6(*,*,*,*)$ $\stackrel{\text{pyk}}{\to}$ "1deduction six " conclude " exception " bound " end 1deduction"]

[$\mathrm{Dedu}_6^*(*,*,*,*)$ $\stackrel{\text{pyk}}{\to}$ "1deduction six star " conclude " exception " bound " end 1deduction"]

[$\mathrm{Dedu}_7(*)$ $\stackrel{\text{pyk}}{\to}$ "1deduction seven " end 1deduction"]

[$\mathrm{Dedu}_8(*,*)$ $\stackrel{\text{pyk}}{\to}$ "1deduction eight " bound " end 1deduction"]

[$\mathrm{Dedu}_8^*(*,*)$ $\stackrel{\text{pyk}}{\to}$ "1deduction eight star " bound " end 1deduction"]

[Ex_1 $\stackrel{\text{pyk}}{\to}$ "ex1"]

[Ex_2 $\stackrel{\text{pyk}}{\to}$ "ex2"]

[Ex3 $\stackrel{\text{pyk}}{\to}$ "ex3"]

[Ex_{10} $\stackrel{\text{pyk}}{\to}$ "ex10"]

[Ex_{20} $\stackrel{\text{pyk}}{\to}$ "ex20"]

[$*_{\mathrm{Ex}}$ $\stackrel{\text{pyk}}{\to}$ "existential var " end var"]

[$*^{\mathrm{Ex}}$ $\stackrel{\text{pyk}}{\to}$ "" is existential var"]

$[\langle * \equiv * \,|\, * :== * \rangle_{\mathrm{Ex}} \stackrel{\mathrm{pyk}}{\rightarrow}$ "exist-sub " is " where " is " end sub"]

$[\langle * \equiv^{0} * \,|\, * :== * \rangle_{\mathrm{Ex}} \stackrel{\mathrm{pyk}}{\rightarrow}$ "exist-sub0 " is " where " is " end sub"]

$[\langle * \equiv^{1} * \,|\, * :== * \rangle_{\mathrm{Ex}} \stackrel{\mathrm{pyk}}{\rightarrow}$ "exist-sub1 " is " where " is " end sub"]

$[\langle * \equiv^{*} * \,|\, * :== * \rangle_{\mathrm{Ex}} \stackrel{\mathrm{pyk}}{\rightarrow}$ "exist-sub∗ " is " where " is " end sub"]

$[\mathrm{ph}_1 \stackrel{\mathrm{pyk}}{\rightarrow}$ "ph1"]

$[\mathrm{ph}_2 \stackrel{\mathrm{pyk}}{\rightarrow}$ "ph2"]

$[\mathrm{ph}_3 \stackrel{\mathrm{pyk}}{\rightarrow}$ "ph3"]

$[*_{\mathrm{Ph}} \stackrel{\mathrm{pyk}}{\rightarrow}$ "placeholder-var " end var"]

$[*^{\mathrm{Ph}} \stackrel{\mathrm{pyk}}{\rightarrow}$ "" is placeholder-var"]

$[\langle * \equiv * \,|\, * :== * \rangle_{\mathrm{Ph}} \stackrel{\mathrm{pyk}}{\rightarrow}$ "ph-sub " is " where " is " end sub"]

$[\langle * \equiv^{0} * \,|\, * :== * \rangle_{\mathrm{Ph}} \stackrel{\mathrm{pyk}}{\rightarrow}$ "ph-sub0 " is " where " is " end sub"]

$[\langle * \equiv^{1} * \,|\, * :== * \rangle_{\mathrm{Ph}} \stackrel{\mathrm{pyk}}{\rightarrow}$ "ph-sub1 " is " where " is " end sub"]

$[\langle * \equiv^{*} * \,|\, * :== * \rangle_{\mathrm{Ph}} \stackrel{\mathrm{pyk}}{\rightarrow}$ "ph-sub∗ " is " where " is " end sub"]

$[\langle * \equiv * \,|\, * :== * \rangle_{\mathrm{Me}} \stackrel{\mathrm{pyk}}{\rightarrow}$ "meta-sub " is " where " is " end sub"]

$[\langle * \equiv^{1} * \,|\, * :== * \rangle_{\mathrm{Me}} \stackrel{\mathrm{pyk}}{\rightarrow}$ "meta-sub1 " is " where " is " end sub"]

$[\langle * \equiv^{*} * \,|\, * :== * \rangle_{\mathrm{Me}} \stackrel{\mathrm{pyk}}{\rightarrow}$ "meta-sub∗ " is " where " is " end sub"]

$[\mathsf{bs} \stackrel{\mathrm{pyk}}{\rightarrow}$ "var big set"]

$[\mathsf{OBS} \stackrel{\mathrm{pyk}}{\rightarrow}$ "object big set"]

$[\mathcal{BS} \stackrel{\mathrm{pyk}}{\rightarrow}$ "meta big set"]

$[\emptyset \stackrel{\mathrm{pyk}}{\rightarrow}$ "zermelo empty set"]

$[\mathrm{SystemQ} \stackrel{\mathrm{pyk}}{\rightarrow}$ "system Q"]

$[\mathrm{MP} \stackrel{\mathrm{pyk}}{\rightarrow}$ "1rule mp"]

$[\mathrm{Gen} \stackrel{\mathrm{pyk}}{\rightarrow}$ "1rule gen"]

$[\mathrm{Repetition} \stackrel{\mathrm{pyk}}{\rightarrow}$ "1rule repetition"]

$[\mathrm{Neg} \stackrel{\mathrm{pyk}}{\rightarrow}$ "1rule ad absurdum"]

$[\mathrm{Ded} \stackrel{\mathrm{pyk}}{\rightarrow}$ "1rule deduction"]

$[\mathrm{ExistIntro} \stackrel{\mathrm{pyk}}{\rightarrow}$ "1rule exist intro"]

$[\mathrm{Extensionality} \stackrel{\mathrm{pyk}}{\rightarrow}$ "axiom extensionality"]

$[\emptyset\mathrm{def} \stackrel{\mathrm{pyk}}{\rightarrow}$ "axiom empty set"]

$[\mathrm{PairDef} \stackrel{\mathrm{pyk}}{\rightarrow}$ "axiom pair definition"]

$[\mathrm{UnionDef} \stackrel{\mathrm{pyk}}{\rightarrow}$ "axiom union definition"]

$[\mathrm{PowerDef} \stackrel{\mathrm{pyk}}{\rightarrow}$ "axiom power definition"]

$[\mathrm{SeparationDef} \stackrel{\mathrm{pyk}}{\rightarrow}$ "axiom separation definition"]

$[\mathrm{AddDoubleNeg} \stackrel{\mathrm{pyk}}{\rightarrow}$ "prop lemma add double neg"]

$[\mathrm{RemoveDoubleNeg} \stackrel{\mathrm{pyk}}{\rightarrow}$ "prop lemma remove double neg"]

[AndCommutativity $\stackrel{\text{pyk}}{\rightarrow}$ "prop lemma and commutativity"]

[AutoImply $\stackrel{\text{pyk}}{\rightarrow}$ "prop lemma auto imply"]

[Contrapositive $\stackrel{\text{pyk}}{\rightarrow}$ "prop lemma contrapositive"]

[FirstConjunct $\stackrel{\text{pyk}}{\rightarrow}$ "prop lemma first conjunct"]

[SecondConjunct $\stackrel{\text{pyk}}{\rightarrow}$ "prop lemma second conjunct"]

[FromContradiction $\stackrel{\text{pyk}}{\rightarrow}$ "prop lemma from contradiction"]

[FromDisjuncts $\stackrel{\text{pyk}}{\rightarrow}$ "prop lemma from disjuncts"]

[IffCommutativity $\stackrel{\text{pyk}}{\rightarrow}$ "prop lemma iff commutativity"]

[IffFirst $\stackrel{\text{pyk}}{\rightarrow}$ "prop lemma iff first"]

[IffSecond $\stackrel{\text{pyk}}{\rightarrow}$ "prop lemma iff second"]

[ImplyTransitivity $\stackrel{\text{pyk}}{\rightarrow}$ "prop lemma imply transitivity"]

[JoinConjuncts $\stackrel{\text{pyk}}{\rightarrow}$ "prop lemma join conjuncts"]

[MP2 $\stackrel{\text{pyk}}{\rightarrow}$ "prop lemma mp2"]

[MP3 $\stackrel{\text{pyk}}{\rightarrow}$ "prop lemma mp3"]

[MP4 $\stackrel{\text{pyk}}{\rightarrow}$ "prop lemma mp4"]

[MP5 $\stackrel{\text{pyk}}{\rightarrow}$ "prop lemma mp5"]

[MT $\stackrel{\text{pyk}}{\rightarrow}$ "prop lemma mt"]

[NegativeMT $\stackrel{\text{pyk}}{\rightarrow}$ "prop lemma negative mt"]

[Technicality $\stackrel{\text{pyk}}{\rightarrow}$ "prop lemma technicality"]

[Weakening $\stackrel{\text{pyk}}{\rightarrow}$ "prop lemma weakening"]

[WeakenOr1 $\stackrel{\text{pyk}}{\rightarrow}$ "prop lemma weaken or first"]

[WeakenOr2 $\stackrel{\text{pyk}}{\rightarrow}$ "prop lemma weaken or second"]

[Formula2Pair $\stackrel{\text{pyk}}{\rightarrow}$ "lemma formula2pair"]

[Pair2Formula $\stackrel{\text{pyk}}{\rightarrow}$ "lemma pair2formula"]

[Formula2Union $\stackrel{\text{pyk}}{\rightarrow}$ "lemma formula2union"]

[Union2Formula $\stackrel{\text{pyk}}{\rightarrow}$ "lemma union2formula"]

[Formula2Sep $\stackrel{\text{pyk}}{\rightarrow}$ "lemma formula2separation"]

[Sep2Formula $\stackrel{\text{pyk}}{\rightarrow}$ "lemma separation2formula"]

[Formula2Power $\stackrel{\text{pyk}}{\rightarrow}$ "lemma formula2power"]

[SubsetInPower $\stackrel{\text{pyk}}{\rightarrow}$ "lemma subset in power set"]

[HelperPowerIsSub $\stackrel{\text{pyk}}{\rightarrow}$ "lemma power set is subset0"]

[PowerIsSub $\stackrel{\text{pyk}}{\rightarrow}$ "lemma power set is subset"]

[(Switch)HelperPowerIsSub $\stackrel{\text{pyk}}{\rightarrow}$ "lemma power set is subset0-switch"]

[(Switch)PowerIsSub $\stackrel{\text{pyk}}{\rightarrow}$ "lemma power set is subset-switch"]

[ToSetEquality $\stackrel{\text{pyk}}{\rightarrow}$ "lemma set equality suff condition"]

[HelperToSetEquality(t) $\stackrel{\text{pyk}}{\to}$ "lemma set equality suff condition(t)0"]

[ToSetEquality(t) $\stackrel{\text{pyk}}{\to}$ "lemma set equality suff condition(t)"]

[HelperFromSetEquality $\stackrel{\text{pyk}}{\to}$ "lemma set equality skip quantifier"]

[FromSetEquality $\stackrel{\text{pyk}}{\to}$ "lemma set equality nec condition"]

[HelperReflexivity $\stackrel{\text{pyk}}{\to}$ "lemma reflexivity0"]

[Reflexivity $\stackrel{\text{pyk}}{\to}$ "lemma reflexivity"]

[HelperSymmetry $\stackrel{\text{pyk}}{\to}$ "lemma symmetry0"]

[Symmetry $\stackrel{\text{pyk}}{\to}$ "lemma symmetry"]

[HelperTransitivity $\stackrel{\text{pyk}}{\to}$ "lemma transitivity0"]

[Transitivity $\stackrel{\text{pyk}}{\to}$ "lemma transitivity"]

[ERisReflexive $\stackrel{\text{pyk}}{\to}$ "lemma er is reflexive"]

[ERisSymmetric $\stackrel{\text{pyk}}{\to}$ "lemma er is symmetric"]

[ERisTransitive $\stackrel{\text{pyk}}{\to}$ "lemma er is transitive"]

[ØisSubset $\stackrel{\text{pyk}}{\to}$ "lemma empty set is subset"]

[HelperMemberNotØ $\stackrel{\text{pyk}}{\to}$ "lemma member not empty0"]

[MemberNotØ $\stackrel{\text{pyk}}{\to}$ "lemma member not empty"]

[HelperUniqueØ $\stackrel{\text{pyk}}{\to}$ "lemma unique empty set0"]

[UniqueØ $\stackrel{\text{pyk}}{\to}$ "lemma unique empty set"]

[==Reflexivity $\stackrel{\text{pyk}}{\to}$ "lemma ==Reflexivity"]

[==Symmetry $\stackrel{\text{pyk}}{\to}$ "lemma ==Symmetry"]

[Helper==Transitivity $\stackrel{\text{pyk}}{\to}$ "lemma ==Transitivity0"]

[==Transitivity $\stackrel{\text{pyk}}{\to}$ "lemma ==Transitivity"]

[HelperTransferNotEq $\stackrel{\text{pyk}}{\to}$ "lemma transfer ~is0"]

[TransferNotEq $\stackrel{\text{pyk}}{\to}$ "lemma transfer ~is"]

[HelperPairSubset $\stackrel{\text{pyk}}{\to}$ "lemma pair subset0"]

[Helper(2)PairSubset $\stackrel{\text{pyk}}{\to}$ "lemma pair subset1"]

[PairSubset $\stackrel{\text{pyk}}{\to}$ "lemma pair subset"]

[SamePair $\stackrel{\text{pyk}}{\to}$ "lemma same pair"]

[SameSingleton $\stackrel{\text{pyk}}{\to}$ "lemma same singleton"]

[UnionSubset $\stackrel{\text{pyk}}{\to}$ "lemma union subset"]

[SameUnion $\stackrel{\text{pyk}}{\to}$ "lemma same union"]

[SeparationSubset $\stackrel{\text{pyk}}{\to}$ "lemma separation subset"]

[SameSeparation $\stackrel{\text{pyk}}{\to}$ "lemma same separation"]

[SameBinaryUnion $\stackrel{\text{pyk}}{\to}$ "lemma same binary union"]

[IntersectionSubset $\stackrel{\text{pyk}}{\to}$ "lemma intersection subset"]

[SameIntersection $\stackrel{\text{pyk}}{\to}$ "lemma same intersection"]

[AutoMember $\stackrel{\text{pyk}}{\to}$ "lemma auto member"]

[HelperEqSysNot∅ $\stackrel{\text{pyk}}{\to}$ "lemma eq-system not empty0"]

[EqSysNot∅ $\stackrel{\text{pyk}}{\to}$ "lemma eq-system not empty"]

[HelperEqSubset $\stackrel{\text{pyk}}{\to}$ "lemma eq subset0"]

[EqSubset $\stackrel{\text{pyk}}{\to}$ "lemma eq subset"]

[HelperEqNecessary $\stackrel{\text{pyk}}{\to}$ "lemma equivalence nec condition0"]

[EqNecessary $\stackrel{\text{pyk}}{\to}$ "lemma equivalence nec condition"]

[HelperNoneEqNecessary $\stackrel{\text{pyk}}{\to}$ "lemma none-equivalence nec condition0"]

[Helper(2)NoneEqNecessary $\stackrel{\text{pyk}}{\to}$ "lemma none-equivalence nec condition1"]

[NoneEqNecessary $\stackrel{\text{pyk}}{\to}$ "lemma none-equivalence nec condition"]

[EqClassIsSubset $\stackrel{\text{pyk}}{\to}$ "lemma equivalence class is subset"]

[EqClassesAreDisjoint $\stackrel{\text{pyk}}{\to}$ "lemma equivalence classes are disjoint"]

[AllDisjoint $\stackrel{\text{pyk}}{\to}$ "lemma all disjoint"]

[AllDisjointImply $\stackrel{\text{pyk}}{\to}$ "lemma all disjoint-imply"]

[BSsubset $\stackrel{\text{pyk}}{\to}$ "lemma bs subset union(bs/r)"]

[Union(BS/R)subset $\stackrel{\text{pyk}}{\to}$ "lemma union(bs/r) subset bs"]

[UnionIdentity $\stackrel{\text{pyk}}{\to}$ "lemma union(bs/r) is bs"]

[EqSysIsPartition $\stackrel{\text{pyk}}{\to}$ "theorem eq-system is partition"]

[(x1) $\stackrel{\text{pyk}}{\to}$ "var x1"]

[(x2) $\stackrel{\text{pyk}}{\to}$ "var x2"]

[(y1) $\stackrel{\text{pyk}}{\to}$ "var y1"]

[(y2) $\stackrel{\text{pyk}}{\to}$ "var y2"]

[(v1) $\stackrel{\text{pyk}}{\to}$ "var v1"]

[(v2) $\stackrel{\text{pyk}}{\to}$ "var v2"]

[(v3) $\stackrel{\text{pyk}}{\to}$ "var v3"]

[(v4) $\stackrel{\text{pyk}}{\to}$ "var v4"]

[(v2n) $\stackrel{\text{pyk}}{\to}$ "var v2n"]

[(m1) $\stackrel{\text{pyk}}{\to}$ "var m1"]

[(m2) $\stackrel{\text{pyk}}{\to}$ "var m2"]

[(n1) $\stackrel{\text{pyk}}{\to}$ "var n1"]

[(n2) $\stackrel{\text{pyk}}{\to}$ "var n2"]

[(n3) $\stackrel{\text{pyk}}{\to}$ "var n3"]

[(ϵ) $\stackrel{\text{pyk}}{\to}$ "var ep"]

[$(\epsilon)_1$ $\stackrel{\text{pyk}}{\to}$ "var ep1"]

$[(\epsilon 2) \stackrel{\text{pyk}}{\rightarrow}$ "var ep2"$]$

$[(\text{fep}) \stackrel{\text{pyk}}{\rightarrow}$ "var fep"$]$

$[(\text{fx}) \stackrel{\text{pyk}}{\rightarrow}$ "var fx"$]$

$[(\text{fy}) \stackrel{\text{pyk}}{\rightarrow}$ "var fy"$]$

$[(\text{fz}) \stackrel{\text{pyk}}{\rightarrow}$ "var fz"$]$

$[(\text{fu}) \stackrel{\text{pyk}}{\rightarrow}$ "var fu"$]$

$[(\text{fv}) \stackrel{\text{pyk}}{\rightarrow}$ "var fv"$]$

$[(\text{fw}) \stackrel{\text{pyk}}{\rightarrow}$ "var fw"$]$

$[(\text{rx}) \stackrel{\text{pyk}}{\rightarrow}$ "var rx"$]$

$[(\text{ry}) \stackrel{\text{pyk}}{\rightarrow}$ "var ry"$]$

$[(\text{rz}) \stackrel{\text{pyk}}{\rightarrow}$ "var rz"$]$

$[(\text{ru}) \stackrel{\text{pyk}}{\rightarrow}$ "var ru"$]$

$[(\text{sx}) \stackrel{\text{pyk}}{\rightarrow}$ "var sx"$]$

$[(\text{sx1}) \stackrel{\text{pyk}}{\rightarrow}$ "var sx1"$]$

$[(\text{sy}) \stackrel{\text{pyk}}{\rightarrow}$ "var sy"$]$

$[(\text{sy1}) \stackrel{\text{pyk}}{\rightarrow}$ "var sy1"$]$

$[(\text{sz}) \stackrel{\text{pyk}}{\rightarrow}$ "var sz"$]$

$[(\text{sz1}) \stackrel{\text{pyk}}{\rightarrow}$ "var sz1"$]$

$[(\text{su}) \stackrel{\text{pyk}}{\rightarrow}$ "var su"$]$

$[(\text{su1}) \stackrel{\text{pyk}}{\rightarrow}$ "var su1"$]$

$[(\text{fxs}) \stackrel{\text{pyk}}{\rightarrow}$ "var fxs"$]$

$[(\text{fys}) \stackrel{\text{pyk}}{\rightarrow}$ "var fys"$]$

$[(\text{crs1}) \stackrel{\text{pyk}}{\rightarrow}$ "var crs1"$]$

$[(\text{f1}) \stackrel{\text{pyk}}{\rightarrow}$ "var f1"$]$

$[(\text{f2}) \stackrel{\text{pyk}}{\rightarrow}$ "var f2"$]$

$[(\text{f3}) \stackrel{\text{pyk}}{\rightarrow}$ "var f3"$]$

$[(\text{f4}) \stackrel{\text{pyk}}{\rightarrow}$ "var f4"$]$

$[(\text{op1}) \stackrel{\text{pyk}}{\rightarrow}$ "var op1"$]$

$[(\text{op2}) \stackrel{\text{pyk}}{\rightarrow}$ "var op2"$]$

$[(\text{r1}) \stackrel{\text{pyk}}{\rightarrow}$ "var r1"$]$

$[(\text{s1}) \stackrel{\text{pyk}}{\rightarrow}$ "var s1"$]$

$[(\text{s2}) \stackrel{\text{pyk}}{\rightarrow}$ "var s2"$]$

$[\text{X}_1 \stackrel{\text{pyk}}{\rightarrow}$ "meta x1"$]$

$[\text{X}_2 \stackrel{\text{pyk}}{\rightarrow}$ "meta x2"$]$

$[\text{Y}_1 \stackrel{\text{pyk}}{\rightarrow}$ "meta y1"$]$

$[Y_2 \stackrel{\text{pyk}}{\rightarrow}$ "meta y2"$]$

$[V_1 \stackrel{\text{pyk}}{\rightarrow}$ "meta v1"$]$

$[V_2 \stackrel{\text{pyk}}{\rightarrow}$ "meta v2"$]$

$[V_3 \stackrel{\text{pyk}}{\rightarrow}$ "meta v3"$]$

$[V_4 \stackrel{\text{pyk}}{\rightarrow}$ "meta v4"$]$

$[V_{2n} \stackrel{\text{pyk}}{\rightarrow}$ "meta v2n"$]$

$[M_1 \stackrel{\text{pyk}}{\rightarrow}$ "meta m1"$]$

$[M_2 \stackrel{\text{pyk}}{\rightarrow}$ "meta m2"$]$

$[N_1 \stackrel{\text{pyk}}{\rightarrow}$ "meta n1"$]$

$[N_2 \stackrel{\text{pyk}}{\rightarrow}$ "meta n2"$]$

$[N_3 \stackrel{\text{pyk}}{\rightarrow}$ "meta n3"$]$

$[\epsilon \stackrel{\text{pyk}}{\rightarrow}$ "meta ep"$]$

$[\epsilon 1 \stackrel{\text{pyk}}{\rightarrow}$ "meta ep1"$]$

$[\epsilon 2 \stackrel{\text{pyk}}{\rightarrow}$ "meta ep2"$]$

$[\mathrm{FX} \stackrel{\text{pyk}}{\rightarrow}$ "meta fx"$]$

$[\mathrm{FY} \stackrel{\text{pyk}}{\rightarrow}$ "meta fy"$]$

$[\mathrm{FZ} \stackrel{\text{pyk}}{\rightarrow}$ "meta fz"$]$

$[\mathrm{FU} \stackrel{\text{pyk}}{\rightarrow}$ "meta fu"$]$

$[\mathrm{FV} \stackrel{\text{pyk}}{\rightarrow}$ "meta fv"$]$

$[\mathrm{FW} \stackrel{\text{pyk}}{\rightarrow}$ "meta fw"$]$

$[\mathrm{FEP} \stackrel{\text{pyk}}{\rightarrow}$ "meta fep"$]$

$[\mathrm{RX} \stackrel{\text{pyk}}{\rightarrow}$ "meta rx"$]$

$[\mathrm{RY} \stackrel{\text{pyk}}{\rightarrow}$ "meta ry"$]$

$[\mathrm{RZ} \stackrel{\text{pyk}}{\rightarrow}$ "meta rz"$]$

$[\mathrm{RU} \stackrel{\text{pyk}}{\rightarrow}$ "meta ru"$]$

$[(\mathrm{SX}) \stackrel{\text{pyk}}{\rightarrow}$ "meta sx"$]$

$[(\mathrm{SX1}) \stackrel{\text{pyk}}{\rightarrow}$ "meta sx1"$]$

$[(\mathrm{SY}) \stackrel{\text{pyk}}{\rightarrow}$ "meta sy"$]$

$[(\mathrm{SY1}) \stackrel{\text{pyk}}{\rightarrow}$ "meta sy1"$]$

$[(\mathrm{SZ}) \stackrel{\text{pyk}}{\rightarrow}$ "meta sz"$]$

$[(\mathrm{SZ1}) \stackrel{\text{pyk}}{\rightarrow}$ "meta sz1"$]$

$[(\mathrm{SU}) \stackrel{\text{pyk}}{\rightarrow}$ "meta su"$]$

$[(\mathrm{SU1}) \stackrel{\text{pyk}}{\rightarrow}$ "meta su1"$]$

$[\mathrm{FXS} \stackrel{\text{pyk}}{\rightarrow}$ "meta fxs"$]$

$[\mathrm{FYS} \stackrel{\text{pyk}}{\rightarrow}$ "meta fys"$]$

[(F1) $\stackrel{\text{pyk}}{\to}$ "meta f1"]

[(F2) $\stackrel{\text{pyk}}{\to}$ "meta f2"]

[(F3) $\stackrel{\text{pyk}}{\to}$ "meta f3"]

[(F4) $\stackrel{\text{pyk}}{\to}$ "meta f4"]

[(OP1) $\stackrel{\text{pyk}}{\to}$ "meta op1"]

[(OP2) $\stackrel{\text{pyk}}{\to}$ "meta op2"]

[(R1) $\stackrel{\text{pyk}}{\to}$ "meta r1"]

[(S1) $\stackrel{\text{pyk}}{\to}$ "meta s1"]

[(S2) $\stackrel{\text{pyk}}{\to}$ "meta s2"]

[(EPob) $\stackrel{\text{pyk}}{\to}$ "object ep"]

[(CRS1ob) $\stackrel{\text{pyk}}{\to}$ "object crs1"]

[(F1ob) $\stackrel{\text{pyk}}{\to}$ "object f1"]

[(F2ob) $\stackrel{\text{pyk}}{\to}$ "object f2"]

[(F3ob) $\stackrel{\text{pyk}}{\to}$ "object f3"]

[(F4ob) $\stackrel{\text{pyk}}{\to}$ "object f4"]

[(N1ob) $\stackrel{\text{pyk}}{\to}$ "object n1"]

[(N2ob) $\stackrel{\text{pyk}}{\to}$ "object n2"]

[(OP1ob) $\stackrel{\text{pyk}}{\to}$ "object op1"]

[(OP2ob) $\stackrel{\text{pyk}}{\to}$ "object op2"]

[(R1ob) $\stackrel{\text{pyk}}{\to}$ "object r1"]

[(S1ob) $\stackrel{\text{pyk}}{\to}$ "object s1"]

[(S2ob) $\stackrel{\text{pyk}}{\to}$ "object s2"]

[ph_4 $\stackrel{\text{pyk}}{\to}$ "ph4"]

[ph_5 $\stackrel{\text{pyk}}{\to}$ "ph5"]

[ph_6 $\stackrel{\text{pyk}}{\to}$ "ph6"]

[NAT $\stackrel{\text{pyk}}{\to}$ "NAT"]

[$\mathrm{RATIONAL}_{\mathrm{S}}\mathrm{ERIES}$ $\stackrel{\text{pyk}}{\to}$ "RATIONAL_SERIES"]

[SERIES $\stackrel{\text{pyk}}{\to}$ "SERIES"]

[SetOfReals $\stackrel{\text{pyk}}{\to}$ "setOfReals"]

[SetOfFxs $\stackrel{\text{pyk}}{\to}$ "setOfFxs"]

[N $\stackrel{\text{pyk}}{\to}$ "N"]

[Q $\stackrel{\text{pyk}}{\to}$ "Q"]

[X $\stackrel{\text{pyk}}{\to}$ "X"]

[xs $\stackrel{\text{pyk}}{\to}$ "xs"]

[xaF $\stackrel{\text{pyk}}{\to}$ "xsF"] [ysF $\stackrel{\text{pyk}}{\to}$ “ysF”]

[us $\stackrel{\text{pyk}}{\to}$ “us”]

[usFoelge $\stackrel{\text{pyk}}{\to}$ “usF”]

[0 $\stackrel{\text{pyk}}{\to}$ “0”]

[1 $\stackrel{\text{pyk}}{\to}$ “1”]

[(-1) $\stackrel{\text{pyk}}{\to}$ “(-1)”]

[2 $\stackrel{\text{pyk}}{\to}$ “2”]

[3 $\stackrel{\text{pyk}}{\to}$ “3”]

[1/2 $\stackrel{\text{pyk}}{\to}$ “1/2”]

[1/3 $\stackrel{\text{pyk}}{\to}$ “1/3”]

[2/3 $\stackrel{\text{pyk}}{\to}$ “2/3”]

[0f $\stackrel{\text{pyk}}{\to}$ “0f”]

[1f $\stackrel{\text{pyk}}{\to}$ “1f”]

[00 $\stackrel{\text{pyk}}{\to}$ “00”]

[01 $\stackrel{\text{pyk}}{\to}$ “01”]

[$(--01)$ $\stackrel{\text{pyk}}{\to}$ “(--01)”]

[02 $\stackrel{\text{pyk}}{\to}$ “02”]

[01//02 $\stackrel{\text{pyk}}{\to}$ “01//02”]

[PlusAssociativity(R) $\stackrel{\text{pyk}}{\to}$ “lemma plusAssociativity(R)”]

[PlusAssociativity(R)XX $\stackrel{\text{pyk}}{\to}$ “lemma plusAssociativity(R)XX”]

[Plus0(R) $\stackrel{\text{pyk}}{\to}$ “lemma plus0(R)”]

[Negative(R) $\stackrel{\text{pyk}}{\to}$ “lemma negative(R)”]

[Times1(R) $\stackrel{\text{pyk}}{\to}$ “lemma times1(R)”]

[lessAddition(R) $\stackrel{\text{pyk}}{\to}$ “lemma lessAddition(R)”]

[PlusCommutativity(R) $\stackrel{\text{pyk}}{\to}$ “lemma plusCommutativity(R)”]

[LeqAntisymmetry(R) $\stackrel{\text{pyk}}{\to}$ “lemma leqAntisymmetry(R)”]

[LeqTransitivity(R) $\stackrel{\text{pyk}}{\to}$ “lemma leqTransitivity(R)”]

[leqAddition(R) $\stackrel{\text{pyk}}{\to}$ “lemma leqAddition(R)”]

[Distribution(R) $\stackrel{\text{pyk}}{\to}$ “lemma distribution(R)”]

[A4(Axiom) $\stackrel{\text{pyk}}{\to}$ “axiom a4”]

[InductionAxiom $\stackrel{\text{pyk}}{\to}$ “axiom induction”]

[EqualityAxiom $\stackrel{\text{pyk}}{\to}$ “axiom equality”]

[EqLeqAxiom $\stackrel{\text{pyk}}{\to}$ “axiom eqLeq”]

[EqAdditionAxiom $\stackrel{\text{pyk}}{\to}$ “axiom eqAddition”]

[EqMultiplicationAxiom $\stackrel{\text{pyk}}{\to}$ “axiom eqMultiplication”]

[QisClosed(Reciprocal)(Imply) $\stackrel{\text{pyk}}{\rightarrow}$ “axiom QisClosed(reciprocal)”]
[QisClosed(Reciprocal) $\stackrel{\text{pyk}}{\rightarrow}$ “lemma QisClosed(reciprocal)”]
[QisClosed(Negative)(Imply) $\stackrel{\text{pyk}}{\rightarrow}$ “axiom QisClosed(negative)”]
[QisClosed(Negative) $\stackrel{\text{pyk}}{\rightarrow}$ “lemma QisClosed(negative)”]
[leqReflexivity $\stackrel{\text{pyk}}{\rightarrow}$ “axiom leqReflexivity”]
[leqAntisymmetryAxiom $\stackrel{\text{pyk}}{\rightarrow}$ “axiom leqAntisymmetry”]
[leqTransitivityAxiom $\stackrel{\text{pyk}}{\rightarrow}$ “axiom leqTransitivity”]
[leqTotality $\stackrel{\text{pyk}}{\rightarrow}$ “axiom leqTotality”]
[leqAdditionAxiom $\stackrel{\text{pyk}}{\rightarrow}$ “axiom leqAddition”]
[leqMultiplicationAxiom $\stackrel{\text{pyk}}{\rightarrow}$ “axiom leqMultiplication”]
[plusAssociativity $\stackrel{\text{pyk}}{\rightarrow}$ “axiom plusAssociativity”]
[plusCommutativity $\stackrel{\text{pyk}}{\rightarrow}$ “axiom plusCommutativity”]
[Negative $\stackrel{\text{pyk}}{\rightarrow}$ “axiom negative”]
[plus0 $\stackrel{\text{pyk}}{\rightarrow}$ “axiom plus0”]
[timesAssociativity $\stackrel{\text{pyk}}{\rightarrow}$ “axiom timesAssociativity”]
[timesCommutativity $\stackrel{\text{pyk}}{\rightarrow}$ “axiom timesCommutativity”]
[ReciprocalAxiom $\stackrel{\text{pyk}}{\rightarrow}$ “axiom reciprocal”]
[times1 $\stackrel{\text{pyk}}{\rightarrow}$ “axiom times1”]
[Distribution $\stackrel{\text{pyk}}{\rightarrow}$ “axiom distribution”]
[0not1 $\stackrel{\text{pyk}}{\rightarrow}$ “axiom 0not1”]
[lemma eqLeq(R) $\stackrel{\text{pyk}}{\rightarrow}$ “lemma eqLeq(R)”]
[TimesAssociativity(R) $\stackrel{\text{pyk}}{\rightarrow}$ “lemma timesAssociativity(R)”]
[TimesCommutativity(R) $\stackrel{\text{pyk}}{\rightarrow}$ “lemma timesCommutativity(R)”]
[(Adgic)SameR $\stackrel{\text{pyk}}{\rightarrow}$ “1rule adhoc sameR”]
[Separation2formula(1) $\stackrel{\text{pyk}}{\rightarrow}$ “lemma separation2formula(1)”]
[Separation2formula(2) $\stackrel{\text{pyk}}{\rightarrow}$ “lemma separation2formula(2)”]
[Cauchy $\stackrel{\text{pyk}}{\rightarrow}$ “axiom cauchy”]
[PlusF $\stackrel{\text{pyk}}{\rightarrow}$ “axiom plusF”]
[ReciprocalF $\stackrel{\text{pyk}}{\rightarrow}$ “axiom reciprocalF”]
[From ==$\stackrel{\text{pyk}}{\rightarrow}$ “1rule from==”]
[To ==$\stackrel{\text{pyk}}{\rightarrow}$ “1rule to==”]
[FromInR $\stackrel{\text{pyk}}{\rightarrow}$ “1rule fromInR”]
[PlusR(Sym) $\stackrel{\text{pyk}}{\rightarrow}$ “lemma plusR(Sym)”]
[ReciprocalR(Axiom) $\stackrel{\text{pyk}}{\rightarrow}$ “axiom reciprocalR”]
[LessMinus1(N) $\stackrel{\text{pyk}}{\rightarrow}$ “1rule lessMinus1(N)”]

[Nonnegative(N) $\stackrel{\text{pyk}}{\to}$ "axiom nonnegative(N)"]

[US0 $\stackrel{\text{pyk}}{\to}$ "axiom US0"]

[NextXS(UpperBound) $\stackrel{\text{pyk}}{\to}$ "1rule nextXS(upperBound)"]

[NextXS(NoUpperBound) $\stackrel{\text{pyk}}{\to}$ "1rule nextXS(noUpperBound)"]

[NextUS(UpperBound) $\stackrel{\text{pyk}}{\to}$ "1rule nextUS(upperBound)"]

[NextUS(NoUpperBound) $\stackrel{\text{pyk}}{\to}$ "1rule nextUS(noUpperBound)"]

[ExpZero $\stackrel{\text{pyk}}{\to}$ "1rule expZero"]

[ExpPositive $\stackrel{\text{pyk}}{\to}$ "1rule expPositive"]

[ExpZero(R) $\stackrel{\text{pyk}}{\to}$ "1rule expZero(R)"]

[ExpPositive(R) $\stackrel{\text{pyk}}{\to}$ "1rule expPositive(R)"]

[BSzero $\stackrel{\text{pyk}}{\to}$ "1rule base(1/2)Sum zero"]

[BSpositive $\stackrel{\text{pyk}}{\to}$ "1rule base(1/2)Sum positive"]

[UStelescope(Zero) $\stackrel{\text{pyk}}{\to}$ "1rule UStelescope zero"]

[UStelescope(Positive) $\stackrel{\text{pyk}}{\to}$ "1rule UStelescope positive"]

[EqAddition(R) $\stackrel{\text{pyk}}{\to}$ "1rule adhoc eqAddition(R)"]

[FromLimit $\stackrel{\text{pyk}}{\to}$ "1rule fromLimit"]

[ToUpperBound $\stackrel{\text{pyk}}{\to}$ "1rule toUpperBound"]

[FromUpperBound $\stackrel{\text{pyk}}{\to}$ "1rule fromUpperBound"]

[USisUpperBound $\stackrel{\text{pyk}}{\to}$ "axiom USisUpperBound"]

[0not1(R) $\stackrel{\text{pyk}}{\to}$ "axiom 0not1(R)"]

[ExpUnbounded(R) $\stackrel{\text{pyk}}{\to}$ "1rule expUnbounded"]

[FromLeq(Advanced)(N) $\stackrel{\text{pyk}}{\to}$ "1rule fromLeq(Advanced)(N)"]

[FromLeastUpperBound $\stackrel{\text{pyk}}{\to}$ "1rule fromLeastUpperBound"]

[ToLeastUpperBound $\stackrel{\text{pyk}}{\to}$ "1rule toLeastUpperBound"]

[XSisNotUpperBound $\stackrel{\text{pyk}}{\to}$ "axiom XSisNotUpperBound"]

[ysFGreater $\stackrel{\text{pyk}}{\to}$ "axiom ysFGreater"]

[ysFLess $\stackrel{\text{pyk}}{\to}$ "axiom ysFLess"]

[SmallInverse $\stackrel{\text{pyk}}{\to}$ "1rule smallInverse"]

[NatType $\stackrel{\text{pyk}}{\to}$ "axiom natType"]

[RationalType $\stackrel{\text{pyk}}{\to}$ "axiom rationalType"]

[SeriesType $\stackrel{\text{pyk}}{\to}$ "axiom seriesType"]

[Max $\stackrel{\text{pyk}}{\to}$ "axiom max"]

[Numerical $\stackrel{\text{pyk}}{\to}$ "axiom numerical"]

[NumericalF $\stackrel{\text{pyk}}{\to}$ "axiom numericalF"]

[MemberOfSeries(Imply) $\stackrel{\text{pyk}}{\to}$ "axiom memberOfSeries"]

[JoinConjuncts(2conditions) $\stackrel{\text{pyk}}{\to}$ “prop lemma doubly conditioned join conjuncts”]

[prop lemma imply negation $\stackrel{\text{pyk}}{\to}$ “prop lemma imply negation”]

[TND $\stackrel{\text{pyk}}{\to}$ “prop lemma tertium non datur”]

[FromNegatedImply $\stackrel{\text{pyk}}{\to}$ “prop lemma from negated imply”]

[ToNegatedImply $\stackrel{\text{pyk}}{\to}$ “prop lemma to negated imply”]

[FromNegated(2 $*$ Imply) $\stackrel{\text{pyk}}{\to}$ “prop lemma from negated double imply”]

[FromNegatedAnd $\stackrel{\text{pyk}}{\to}$ “prop lemma from negated and”]

[FromNegatedOr $\stackrel{\text{pyk}}{\to}$ “prop lemma from negated or”]

[ToNegatedOr $\stackrel{\text{pyk}}{\to}$ “prop lemma to negated or”]

[FromNegations $\stackrel{\text{pyk}}{\to}$ “prop lemma from negations”]

[From3Disjuncts $\stackrel{\text{pyk}}{\to}$ “prop lemma from three disjuncts”]

[From2 $*$ 2Disjuncts $\stackrel{\text{pyk}}{\to}$ “prop lemma from two times two disjuncts”]

[NegateDisjunct1 $\stackrel{\text{pyk}}{\to}$ “prop lemma negate first disjunct”]

[NegateDisjunct2 $\stackrel{\text{pyk}}{\to}$ “prop lemma negate second disjunct”]

[ExpandDisjuncts $\stackrel{\text{pyk}}{\to}$ “prop lemma expand disjuncts”]

[SENC1 $\stackrel{\text{pyk}}{\to}$ “lemma set equality nec condition(1)”]

[SENC2 $\stackrel{\text{pyk}}{\to}$ “lemma set equality nec condition(2)”]

[LessLeq(R) $\stackrel{\text{pyk}}{\to}$ “lemma lessLeq(R)”]

[MemberOfSeries $\stackrel{\text{pyk}}{\to}$ “lemma memberOfSeries”]

[memberOfSeries(Type) $\stackrel{\text{pyk}}{\to}$ “lemma memberOfSeries(Type)”]

[$*$(exp)$*$ $\stackrel{\text{pyk}}{\to}$ “" ^ "”]

[R($*$) $\stackrel{\text{pyk}}{\to}$ “R(")”]

[$--$ R($*$) $\stackrel{\text{pyk}}{\to}$ “--R(")”]

[rec$*$ $\stackrel{\text{pyk}}{\to}$ “1/ "”]

[$*/*$ $\stackrel{\text{pyk}}{\to}$ “eq-system of " modulo "”]

[$* \cap *$ $\stackrel{\text{pyk}}{\to}$ “intersection " comma " end intersection”]

[$*[*]$ $\stackrel{\text{pyk}}{\to}$ “[" ; "]”]

[$\cup *$ $\stackrel{\text{pyk}}{\to}$ “union " end union”]

[$* \cup *$ $\stackrel{\text{pyk}}{\to}$ “binary-union " comma " end union”]

[P($*$) $\stackrel{\text{pyk}}{\to}$ “power " end power”]

[$\{*\}$ $\stackrel{\text{pyk}}{\to}$ “zermelo singleton " end singleton”]

[StateExpand($*, *, *$) $\stackrel{\text{pyk}}{\to}$ “stateExpand(" , " , ")”]

[extractSeries($*$) $\stackrel{\text{pyk}}{\to}$ “extractSeries(")”]

[SetOfSeries($*$) $\stackrel{\text{pyk}}{\to}$ “setOfSeries(")”]

[$--$Macro($*$) $\stackrel{\text{pyk}}{\rightarrow}$ “--Macro(")”]

[ExpandList($*,*,*$) $\stackrel{\text{pyk}}{\rightarrow}$ “expandList(" , " , ")”]

[$**$Macro($*$) $\stackrel{\text{pyk}}{\rightarrow}$ “$**$Macro(")”]

[$++$Macro($*$) $\stackrel{\text{pyk}}{\rightarrow}$ “++Macro(")”]

[$<<$ Macro($*$) $\stackrel{\text{pyk}}{\rightarrow}$ “<<Macro(")”]

[$||$Macro($*$) $\stackrel{\text{pyk}}{\rightarrow}$ “||Macro(")”]

[01//Macro($*$) $\stackrel{\text{pyk}}{\rightarrow}$ “01//Macro(")”]

[UB($*,*$) $\stackrel{\text{pyk}}{\rightarrow}$ “upperBound(" , ")”]

[LUB($*,*$) $\stackrel{\text{pyk}}{\rightarrow}$ “leastUpperBound(" , ")”]

[BS($*,*$) $\stackrel{\text{pyk}}{\rightarrow}$ “base(1/2)Sum(" , ")”]

[UStelescope($*,*$) $\stackrel{\text{pyk}}{\rightarrow}$ “UStelescope(" , ")”]

[($*$) $\stackrel{\text{pyk}}{\rightarrow}$ “(")”]

[|f $*$ | $\stackrel{\text{pyk}}{\rightarrow}$ “|f " |”]

[|r $*$ | $\stackrel{\text{pyk}}{\rightarrow}$ “|r " |”]

[Limit($*,*$) $\stackrel{\text{pyk}}{\rightarrow}$ “limit(" , ")”]

[Union($*$) $\stackrel{\text{pyk}}{\rightarrow}$ “U(")”]

[IsOrderedPair($*,*,*$) $\stackrel{\text{pyk}}{\rightarrow}$ “isOrderedPair(" , " , ")”]

[IsRelation($*,*,*$) $\stackrel{\text{pyk}}{\rightarrow}$ “isRelation(" , " , ")”]

[isFunction($*,*,*$) $\stackrel{\text{pyk}}{\rightarrow}$ “isFunction(" , " , ")”]

[IsSeries($*,*$) $\stackrel{\text{pyk}}{\rightarrow}$ “isSeries(" , ")”]

[IsNatural($*,*$) $\stackrel{\text{pyk}}{\rightarrow}$ “isNatural(")”]

[OrderedPair($*,*$) $\stackrel{\text{pyk}}{\rightarrow}$ “(o " , ")”]

[TypeNat($*$) $\stackrel{\text{pyk}}{\rightarrow}$ “typeNat(")”]

[TypeNat0($*$) $\stackrel{\text{pyk}}{\rightarrow}$ “typeNat0(")”]

[TypeRational($*$) $\stackrel{\text{pyk}}{\rightarrow}$ “typeRational(")”]

[TypeRational0($*$) $\stackrel{\text{pyk}}{\rightarrow}$ “typeRational0(")”]

[TypeSeries($*,*$) $\stackrel{\text{pyk}}{\rightarrow}$ “typeSeries(" , ")”]

[Typeseries0($*,*$) $\stackrel{\text{pyk}}{\rightarrow}$ “typeSeries0(" , ")”]

[$\{*,*\}$ $\stackrel{\text{pyk}}{\rightarrow}$ “zermelo pair " comma " end pair”]

[$\langle *,* \rangle$ $\stackrel{\text{pyk}}{\rightarrow}$ “zermelo ordered pair " comma " end pair”]

[($-$u$*$) $\stackrel{\text{pyk}}{\rightarrow}$ “- "”]

[$-_{\mathrm{f}}*$ $\stackrel{\text{pyk}}{\rightarrow}$ “-f "”]

[($--*$) $\stackrel{\text{pyk}}{\rightarrow}$ “-- "”]

[1f/$*$ $\stackrel{\text{pyk}}{\rightarrow}$ “1f/ "”]

[01//temp$*$ $\stackrel{\text{pyk}}{\rightarrow}$ “01// "”]

$[*(*,*) \stackrel{\text{pyk}}{\rightarrow}$ “" is related to " under "”$]$

$[\text{ReflRel}(*,*) \stackrel{\text{pyk}}{\rightarrow}$ “" is reflexive relation in "”$]$

$[\text{SymRel}(*,*) \stackrel{\text{pyk}}{\rightarrow}$ “" is symmetric relation in "”$]$

$[\text{TransRel}(*,*) \stackrel{\text{pyk}}{\rightarrow}$ “" is transitive relation in "”$]$

$[\text{EqRel}(*,*) \stackrel{\text{pyk}}{\rightarrow}$ “" is equivalence relation in "”$]$

$[[* \in *]_* \stackrel{\text{pyk}}{\rightarrow}$ “equivalence class of " in " modulo "”$]$

$[\text{Partition}(*,*) \stackrel{\text{pyk}}{\rightarrow}$ “" is partition of "”$]$

$[(* * *) \stackrel{\text{pyk}}{\rightarrow}$ “" * "”$]$

$[* *_{\text{f}} * \stackrel{\text{pyk}}{\rightarrow}$ “" *f "”$]$

$[* * ** \stackrel{\text{pyk}}{\rightarrow}$ “" ** "”$]$

$[(* + *) \stackrel{\text{pyk}}{\rightarrow}$ “" + "”$]$

$[(* - *) \stackrel{\text{pyk}}{\rightarrow}$ “" - "”$]$

$[* +_{\text{f}} * \stackrel{\text{pyk}}{\rightarrow}$ “" +f "”$]$

$[* -_{\text{f}} * \stackrel{\text{pyk}}{\rightarrow}$ “" -f "”$]$

$[* + +* \stackrel{\text{pyk}}{\rightarrow}$ “" ++ "”$]$

$[\text{R}(*) - -\text{R}(*) \stackrel{\text{pyk}}{\rightarrow}$ “R(") -- R(")”$]$

$[* \in * \stackrel{\text{pyk}}{\rightarrow}$ “" in0 "”$]$

$[| * | \stackrel{\text{pyk}}{\rightarrow}$ “| " |”$]$

$[\text{if}(*,*,*) \stackrel{\text{pyk}}{\rightarrow}$ “if(" , " , ")”$]$

$[\text{Max}(*,*) \stackrel{\text{pyk}}{\rightarrow}$ “max(" , ")”$]$

$[\text{Max}(*,*) \stackrel{\text{pyk}}{\rightarrow}$ “maxR(" , ")”$]$

$[* = * \stackrel{\text{pyk}}{\rightarrow}$ “" = "”$]$

$[* \neq * \stackrel{\text{pyk}}{\rightarrow}$ “" != "”$]$

$[* <= * \stackrel{\text{pyk}}{\rightarrow}$ “" <= "”$]$

$[* < * \stackrel{\text{pyk}}{\rightarrow}$ “" < "”$]$

$[* <_{\text{f}} * \stackrel{\text{pyk}}{\rightarrow}$ “" <f "”$]$

$[* \leq_{\text{f}} * \stackrel{\text{pyk}}{\rightarrow}$ “" <=f "”$]$

$[\text{SF}(*,*) \stackrel{\text{pyk}}{\rightarrow}$ “" sameF "”$]$

$[* == * \stackrel{\text{pyk}}{\rightarrow}$ “" == "”$]$

$[*!! == * \stackrel{\text{pyk}}{\rightarrow}$ “" !!== "”$]$

$[* << * \stackrel{\text{pyk}}{\rightarrow}$ “" << "”$]$

$[* <<== * \stackrel{\text{pyk}}{\rightarrow}$ “" <<== "”$]$

$[* {=}{=} * \stackrel{\text{pyk}}{\rightarrow}$ “" zermelo is "”$]$

$[* \subseteq * \stackrel{\text{pyk}}{\rightarrow}$ “" is subset of "”$]$

$[\dot{\neg}\, (*)\text{n} \stackrel{\text{pyk}}{\rightarrow}$ “not0 "”$]$

$[* \notin * \stackrel{\text{pyk}}{\rightarrow}$ “" zermelo ~in "”$]$

$[* \neq * \stackrel{\text{pyk}}{\rightarrow}$ “" zermelo ~is "”$]$

$[* \dot{\wedge} * \stackrel{\text{pyk}}{\rightarrow}$ “" and0 "”$]$

$[* \dot{\vee} * \stackrel{\text{pyk}}{\rightarrow}$ “" or0 "”$]$

$[\exists *\colon * \stackrel{\text{pyk}}{\rightarrow}$ “exist0 " indeed "”$]$

$[* \dot{\Leftrightarrow} * \stackrel{\text{pyk}}{\rightarrow}$ “" iff "”$]$

$[\{\text{ph} \in * \mid *\} \stackrel{\text{pyk}}{\rightarrow}$ “the set of ph in " such that " end set”$]$

$[\text{kvanti} \stackrel{\text{pyk}}{\rightarrow}$ “kvanti”$]$

$)^{\mathbf{P}}$

B TeX definitioner

[kvanti $\stackrel{\text{tex}}{=}$ “kvanti”]

[$(\cdots)$ $\stackrel{\text{tex}}{=}$ “(\cdots{})”]

[`Objekt-var` $\stackrel{\text{tex}}{=}$ “\texttt{Objekt-var}”]

[`Ex-var` $\stackrel{\text{tex}}{=}$ “\texttt{Ex-var}”]

[`Ph-var` $\stackrel{\text{tex}}{=}$ “\texttt{Ph-var}”]

[`Værdi` $\stackrel{\text{tex}}{=}$ “\texttt{V\ae{}rdi}”]

[`Variabel` $\stackrel{\text{tex}}{=}$ “\texttt{Variabel}”]

[Op(x) $\stackrel{\text{tex}}{=}$ “Op(#1.
)”]

[Op(x, y) $\stackrel{\text{tex}}{=}$ “Op(#1.
, #2.
)”]

[$\mathsf{x} \mathrel{\ddot{==}} \mathsf{y}$ $\stackrel{\text{tex}}{=}$ “#1.
\mathrel {\ddot {==}} #2.”]

[ContainsEmpty(x) $\stackrel{\text{tex}}{=}$ “ContainsEmpty(#1.
)”]

[Dedu(x, y) $\stackrel{\text{tex}}{=}$ “
Dedu(#1.
, #2.
)”]

[$\text{Dedu}_0(\mathsf{x}, \mathsf{y})$ $\stackrel{\text{tex}}{=}$ “
Dedu_0(#1.
, #2.
)”]

[$\text{Dedu}_\text{s}(\mathsf{x}, \mathsf{y}, \mathsf{z})$ $\stackrel{\text{tex}}{=}$ “Dedu_{s}(#1.
, #2.
, #3.
)”]

[$\text{Dedu}_1(\mathsf{x}, \mathsf{y}, \mathsf{z})$ $\stackrel{\text{tex}}{=}$ “
Dedu_1(#1.
, #2.

, #3.
)"]

[$\mathrm{Dedu}_2(\mathsf{x}, \mathsf{y}, \mathsf{z}) \stackrel{\mathrm{tex}}{=}$ "
Dedu_2(#1.
, #2.
, #3.
)"]

[$\mathrm{Dedu}_3(\mathsf{x}, \mathsf{y}, \mathsf{z}, \mathsf{u}) \stackrel{\mathrm{tex}}{=}$ "
Dedu_3(#1.
, #2.
, #3.
, #4.
)"]

[$\mathrm{Dedu}_4(\mathsf{x}, \mathsf{y}, \mathsf{z}, \mathsf{u}) \stackrel{\mathrm{tex}}{=}$ "
Dedu_4(#1.
, #2.
, #3.
, #4.
)"]

[$\mathrm{Dedu}_4^*(\mathsf{x}, \mathsf{y}, \mathsf{z}, \mathsf{u}) \stackrel{\mathrm{tex}}{=}$ "
Dedu_4^*(#1.
, #2.
, #3.
, #4.
)"]

[$\mathrm{Dedu}_5(\mathsf{x}, \mathsf{y}, \mathsf{z}) \stackrel{\mathrm{tex}}{=}$ "
Dedu_5(#1.
, #2.
, #3.
)"]

[$\mathrm{Dedu}_6(\mathsf{p}, \mathsf{c}, \mathsf{e}, \mathsf{b}) \stackrel{\mathrm{tex}}{=}$ "
Dedu_6(#1.
, #2.
, #3.
, #4.
)"]

[$\mathrm{Dedu}_6^*(\mathsf{p}, \mathsf{c}, \mathsf{e}, \mathsf{b}) \stackrel{\mathrm{tex}}{=}$ "
Dedu_6^*(#1.
, #2.
, #3.

, #4.
)”]

[$\mathrm{Dedu}_7(\mathsf{p}) \stackrel{\text{tex}}{=}$ “
Dedu_7(#1.
)”]

[$\mathrm{Dedu}_8(\mathsf{p}, \mathsf{b}) \stackrel{\text{tex}}{=}$ “
Dedu_8(#1.
, #2.
)”]

[$\mathrm{Dedu}_8^*(\mathsf{p}, \mathsf{b}) \stackrel{\text{tex}}{=}$ “
Dedu_8ˆ∗(#1.
, #2.
)”]

[$\mathrm{Ex}_1 \stackrel{\text{tex}}{=}$ “Ex_{1}”]

[$\mathrm{Ex}_2 \stackrel{\text{tex}}{=}$ “Ex_{2}”]

[$\mathrm{Ex}_{10} \stackrel{\text{tex}}{=}$ “Ex_{10}”]

[$\mathrm{Ex}_{20} \stackrel{\text{tex}}{=}$ “Ex_{20}”]

[$\mathsf{x}_{\mathrm{Ex}} \stackrel{\text{tex}}{=}$ “#1.
_{Ex}”]

[$\mathsf{x}^{\mathrm{Ex}} \stackrel{\text{tex}}{=}$ “#1.
ˆ{Ex}”]

[$\langle \mathsf{x} {\equiv} \mathsf{y} | \mathsf{z} {:==} \mathsf{u} \rangle_{\mathrm{Ex}} \stackrel{\text{tex}}{=}$ “\langle #1.
{\equiv} #2.
| #3.
{:==} #4.
\rangle_{Ex} ”]

[$\langle \mathsf{x} {\equiv}^0 \mathsf{y} | \mathsf{z} {:==} \mathsf{u} \rangle_{\mathrm{Ex}} \stackrel{\text{tex}}{=}$ “\langle #1.
{\equiv}ˆ0 #2.
| #3.
{:==} #4.
\rangle_{Ex} ”]

[$\langle \mathsf{x} {\equiv}^1 \mathsf{y} | \mathsf{z} {:==} \mathsf{u} \rangle_{\mathrm{Ex}} \stackrel{\text{tex}}{=}$ “\langle #1.
{\equiv}ˆ1 #2.
| #3.
{:==} #4.
\rangle_{Ex} ”]

$[\langle \mathsf{x} {\equiv}^* \mathsf{y} | \mathsf{z} {:==} \mathsf{u} \rangle_{\mathrm{Ex}} \stackrel{\mathrm{tex}}{=}$ "\langle #1.
{\equiv}^* #2.
| #3.
{:==} #4.
\rangle_{Ex} "]

$[\mathrm{ph}_1 \stackrel{\mathrm{tex}}{=}$ "ph_{1}"]

$[\mathrm{ph}_2 \stackrel{\mathrm{tex}}{=}$ "ph_{2}"]

$[\mathrm{ph}_3 \stackrel{\mathrm{tex}}{=}$ "ph_{3}"]

$[\mathrm{ph}_4 \stackrel{\mathrm{tex}}{=}$ "ph_{4}"]

$[\mathrm{ph}_5 \stackrel{\mathrm{tex}}{=}$ "ph_{5}"]

$[\mathrm{ph}_6 \stackrel{\mathrm{tex}}{=}$ "ph_{6}"]

$[*_{\mathrm{Ph}} \stackrel{\mathrm{tex}}{=}$ "#1.
_{Ph} "]

$[\mathsf{x}^{\mathrm{Ph}} \stackrel{\mathrm{tex}}{=}$ "#1.
^{Ph}"]

$[\langle \mathsf{x} {\equiv} \mathsf{y} | \mathsf{z} {:==} \mathsf{u} \rangle_{\mathrm{Ph}} \stackrel{\mathrm{tex}}{=}$ "\langle #1.
{\equiv} #2.
| #3.
{:==} #4.
\rangle_{Ph} "]

$[\langle \mathsf{x} {\equiv}^0 \mathsf{y} | \mathsf{z} {:==} \mathsf{u} \rangle_{\mathrm{Ph}} \stackrel{\mathrm{tex}}{=}$ "\langle #1.
{\equiv}^0 #2.
| #3.
{:==} #4.
\rangle_{Ph} "]

$[\langle \mathsf{x} {\equiv}^1 \mathsf{y} | \mathsf{z} {:==} \mathsf{u} \rangle_{\mathrm{Ph}} \stackrel{\mathrm{tex}}{=}$ "\langle #1.
{\equiv}^1 #2.
| #3.
{:==} #4.
\rangle_{Ph} "]

$[\langle \mathsf{x} {\equiv}^* \mathsf{y} | \mathsf{z} {:==} \mathsf{u} \rangle_{\mathrm{Ph}} \stackrel{\mathrm{tex}}{=}$ "\langle #1.
{\equiv}^* #2.
| #3.
{:==} #4.
\rangle_{Ph} "]

[bs $\stackrel{\text{tex}}{=}$ “\mathsf {bs}”]

[OBS $\stackrel{\text{tex}}{=}$ “ \mathsf {OBS}”]

[$\mathcal{BS}$ $\stackrel{\text{tex}}{=}$ “{\cal BS}”]

[Ø $\stackrel{\text{tex}}{=}$ “\mathrm{\O}”]

[SystemQ $\stackrel{\text{tex}}{=}$ “SystemQ”]

[MP $\stackrel{\text{tex}}{=}$ “MP”]

[Gen $\stackrel{\text{tex}}{=}$ “Gen”]

[Repetition $\stackrel{\text{tex}}{=}$ “Repetition”]

[Neg $\stackrel{\text{tex}}{=}$ “Neg”]

[Ded $\stackrel{\text{tex}}{=}$ “Ded”]

[ExistIntro $\stackrel{\text{tex}}{=}$ “ExistIntro”]

[Extensionality $\stackrel{\text{tex}}{=}$ “Extensionality”]

[Ødef $\stackrel{\text{tex}}{=}$ “\O{}def”]

[PairDef $\stackrel{\text{tex}}{=}$ “PairDef”]

[UnionDef $\stackrel{\text{tex}}{=}$ “UnionDef”]

[PowerDef $\stackrel{\text{tex}}{=}$ “PowerDef”]

[SeparationDef $\stackrel{\text{tex}}{=}$ “SeparationDef”]

[AddDoubleNeg $\stackrel{\text{tex}}{=}$ “AddDoubleNeg”]

[RemoveDoubleNeg $\stackrel{\text{tex}}{=}$ “RemoveDoubleNeg”]

[AndCommutativity $\stackrel{\text{tex}}{=}$ “AndCommutativity”]

[AutoImply $\stackrel{\text{tex}}{=}$ “AutoImply”]

[Contrapositive $\stackrel{\text{tex}}{=}$ “Contrapositive”]

[FirstConjunct $\stackrel{\text{tex}}{=}$ “FirstConjunct”]

[SecondConjunct $\stackrel{\text{tex}}{=}$ “SecondConjunct”]

[FromContradiction $\stackrel{\text{tex}}{=}$ “FromContradiction”]

$[\text{FromDisjuncts} \stackrel{\text{tex}}{=} \text{“FromDisjuncts”}]$

$[\text{IffCommutativity} \stackrel{\text{tex}}{=} \text{“IffCommutativity”}]$

$[\text{IffFirst} \stackrel{\text{tex}}{=} \text{“IffFirst”}]$

$[\text{IffSecond} \stackrel{\text{tex}}{=} \text{“IffSecond”}]$

$[\text{ImplyTransitivity} \stackrel{\text{tex}}{=} \text{“ImplyTransitivity”}]$

$[\text{JoinConjuncts} \stackrel{\text{tex}}{=} \text{“JoinConjuncts”}]$

$[\text{MP2} \stackrel{\text{tex}}{=} \text{“MP2”}]$

$[\text{MP3} \stackrel{\text{tex}}{=} \text{“MP3”}]$

$[\text{MP4} \stackrel{\text{tex}}{=} \text{“MP4”}]$

$[\text{MP5} \stackrel{\text{tex}}{=} \text{“MP5”}]$

$[\text{MT} \stackrel{\text{tex}}{=} \text{“MT”}]$

$[\text{NegativeMT} \stackrel{\text{tex}}{=} \text{“NegativeMT”}]$

$[\text{Technicality} \stackrel{\text{tex}}{=} \text{“Technicality”}]$

$[\text{Weakening} \stackrel{\text{tex}}{=} \text{“Weakening”}]$

$[\text{WeakenOr1} \stackrel{\text{tex}}{=} \text{“WeakenOr1”}]$

$[\text{WeakenOr2} \stackrel{\text{tex}}{=} \text{“WeakenOr2”}]$

$[\text{Pair2Formula} \stackrel{\text{tex}}{=} \text{“Pair2Formula”}]$

$[\text{Formula2Pair} \stackrel{\text{tex}}{=} \text{“Formula2Pair”}]$

$[\text{Union2Formula} \stackrel{\text{tex}}{=} \text{“Union2Formula”}]$

$[\text{Formula2Union} \stackrel{\text{tex}}{=} \text{“Formula2Union”}]$

$[\text{Formula2Power} \stackrel{\text{tex}}{=} \text{“Formula2Power”}]$

$[\text{Sep2Formula} \stackrel{\text{tex}}{=} \text{“Sep2Formula”}]$

$[\text{Formula2Sep} \stackrel{\text{tex}}{=} \text{“Formula2Sep”}]$

$[\text{SubsetInPower} \stackrel{\text{tex}}{=} \text{“SubsetInPower”}]$

$[\text{HelperPowerIsSub} \stackrel{\text{tex}}{=} \text{“HelperPowerIsSub”}]$

[PowerIsSub $\stackrel{\text{tex}}{=}$ “PowerIsSub”]

[(Switch)HelperPowerIsSub $\stackrel{\text{tex}}{=}$ “(Switch)HelperPowerIsSub”]

[(Switch)PowerIsSub $\stackrel{\text{tex}}{=}$ “(Switch)PowerIsSub”]

[ToSetEquality $\stackrel{\text{tex}}{=}$ “ToSetEquality”]

[HelperToSetEquality(t) $\stackrel{\text{tex}}{=}$ “HelperToSetEquality(t)”]

[ToSetEquality(t) $\stackrel{\text{tex}}{=}$ “ToSetEquality(t)”]

[HelperFromSetEquality $\stackrel{\text{tex}}{=}$ “HelperFromSetEquality”]

[FromSetEquality $\stackrel{\text{tex}}{=}$ “FromSetEquality”]

[HelperReflexivity $\stackrel{\text{tex}}{=}$ “HelperReflexivity”]

[Reflexivity $\stackrel{\text{tex}}{=}$ “Reflexivity”]

[HelperSymmetry $\stackrel{\text{tex}}{=}$ “HelperSymmetry”]

[Symmetry $\stackrel{\text{tex}}{=}$ “Symmetry”]

[HelperTransitivity $\stackrel{\text{tex}}{=}$ “HelperTransitivity”]

[Transitivity $\stackrel{\text{tex}}{=}$ “Transitivity”],

[ERisReflexive $\stackrel{\text{tex}}{=}$ “ERisReflexive”]

[ERisSymmetric $\stackrel{\text{tex}}{=}$ “ERisSymmetric”]

[ERisTransitive $\stackrel{\text{tex}}{=}$ “ERisTransitive”]

[ØisSubset $\stackrel{\text{tex}}{=}$ “\O{}isSubset”]

[HelperMemberNotØ $\stackrel{\text{tex}}{=}$ “HelperMemberNot\O{}”]

[MemberNotØ $\stackrel{\text{tex}}{=}$ “MemberNot\O{}”]

[HelperUniqueØ $\stackrel{\text{tex}}{=}$ “HelperUnique\O{}”]

[UniqueØ $\stackrel{\text{tex}}{=}$ “Unique\O{}”]

[==Reflexivity $\stackrel{\text{tex}}{=}$ “==\!{}Reflexivity”]

[==Symmetry $\stackrel{\text{tex}}{=}$ “==\!{}Symmetry”]

[Helper==Transitivity $\stackrel{\text{tex}}{=}$ “Helper\!{}==\!{}Transitivity”]

[==Transitivity $\stackrel{\text{tex}}{=}$ “\!{}==\!{}Transitivity”]

[HelperTransferNotEq $\stackrel{\text{tex}}{=}$ “HelperTransferNotEq”]

[TransferNotEq $\stackrel{\text{tex}}{=}$ “TransferNotEq”]

[HelperPairSubset $\stackrel{\text{tex}}{=}$ “HelperPairSubset”]

[Helper(2)PairSubset $\stackrel{\text{tex}}{=}$ “Helper(2)PairSubset”]

[PairSubset $\stackrel{\text{tex}}{=}$ “PairSubset”]

[SamePair $\stackrel{\text{tex}}{=}$ “SamePair”]

[SameSingleton $\stackrel{\text{tex}}{=}$ “SameSingleton”]

[UnionSubset $\stackrel{\text{tex}}{=}$ “UnionSubset”]

[SameUnion $\stackrel{\text{tex}}{=}$ “SameUnion”]

[SeparationSubset $\stackrel{\text{tex}}{=}$ “SeparationSubset”]

[SameSeparation $\stackrel{\text{tex}}{=}$ “SameSeparation”]

[SameBinaryUnion $\stackrel{\text{tex}}{=}$ “SameBinaryUnion”]

[IntersectionSubset $\stackrel{\text{tex}}{=}$ “IntersectionSubset”]

[SameIntersection $\stackrel{\text{tex}}{=}$ “SameIntersection”]

[AutoMember $\stackrel{\text{tex}}{=}$ “AutoMember”]

[HelperEqSysNotØ $\stackrel{\text{tex}}{=}$ “HelperEqSysNot\O{}”]

[EqSysNotØ $\stackrel{\text{tex}}{=}$ “EqSysNot\O{}”]

[HelperEqSubset $\stackrel{\text{tex}}{=}$ “HelperEqSubset”]

[EqSubset $\stackrel{\text{tex}}{=}$ “EqSubset”]

[EqNecessary $\stackrel{\text{tex}}{=}$ “EqNecessary”]

[HelperEqNecessary $\stackrel{\text{tex}}{=}$ “HelperEqNecessary”]

[HelperNoneEqNecessary $\stackrel{\text{tex}}{=}$ “HelperNoneEqNecessary”]

[Helper(2)NoneEqNecessary $\stackrel{\text{tex}}{=}$ “Helper(2)NoneEqNecessary”]

[NoneEqNecessary $\stackrel{\text{tex}}{=}$ “NoneEqNecessary”]

[EqClassIsSubset $\stackrel{\text{tex}}{=}$ "EqClassIsSubset"]

[EqClassesAreDisjoint $\stackrel{\text{tex}}{=}$ "EqClassesAreDisjoint"]

[AllDisjoint $\stackrel{\text{tex}}{=}$ "AllDisjoint"]

[AllDisjointImply $\stackrel{\text{tex}}{=}$ "AllDisjointImply"]

[BSsubset $\stackrel{\text{tex}}{=}$ "BSsubset"]

[Union(BS/R)subset $\stackrel{\text{tex}}{=}$ "Union(BS/R)subset"]

[UnionIdentity $\stackrel{\text{tex}}{=}$ "UnionIdentity"]

[EqSysIsPartition $\stackrel{\text{tex}}{=}$ "EqSysIsPartition"]

[x/y $\stackrel{\text{tex}}{=}$ "#1.
/ #2."]

[$\mathsf{x} \cap \mathsf{y}$ $\stackrel{\text{tex}}{=}$ "#1.
\cap #2."]

[$\cup\mathsf{x}$ $\stackrel{\text{tex}}{=}$ "\cup #1."]

[$\mathsf{x} \cup \mathsf{y}$ $\stackrel{\text{tex}}{=}$ "#1.
\mathrel{\cup} #2."]

[P(x) $\stackrel{\text{tex}}{=}$ "P(#1.
)"]

[$\{\mathsf{x}\}$ $\stackrel{\text{tex}}{=}$ "\{#1.
\}"]

[$\{\mathsf{x}, \mathsf{y}\}$ $\stackrel{\text{tex}}{=}$ "\{#1.
, #2.
\}"]

[$\langle \mathsf{x}, \mathsf{y} \rangle$ $\stackrel{\text{tex}}{=}$ "\langle #1.
, #2.
\rangle"],

[$\mathsf{x} \in \mathsf{y}$ $\stackrel{\text{tex}}{=}$ "#1.
\mathrel{\in} #2."]

[$\mathsf{z}(\mathsf{x}, \mathsf{y})$ $\stackrel{\text{tex}}{=}$ "#3.
(#1.
, #2.
)"]

[ReflRel(r, x) $\stackrel{\text{tex}}{=}$ “ReflRel(#1.
, #2.
)”]

[SymRel(r, x) $\stackrel{\text{tex}}{=}$ “SymRel(#1.
, #2.
)”]

[TransRel(r, x) $\stackrel{\text{tex}}{=}$ “TransRel(#1.
, #2.
)”]

[EqRel(r, x) $\stackrel{\text{tex}}{=}$ “EqRel(#1.
, #2.
)”]

[$[x \in bs]_r$ $\stackrel{\text{tex}}{=}$ “[#1.
\mathrel{\in} #2.
]_{#3.
}”]

[Partition(x, y) $\stackrel{\text{tex}}{=}$ “Partition(#1.
, #2.
)”]

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

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

[$\dot{\neg}\,(x)$n $\stackrel{\text{tex}}{=}$ “\dot{\neg}\, (#1.
)n”]

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

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

[$x \mathrel{\dot{\wedge}} y$ $\stackrel{\text{tex}}{=}$ “#1.
\mathrel{\dot{\wedge}} #2.”]

[$x \mathrel{\dot{\vee}} y$ $\stackrel{\text{tex}}{=}$ “#1.
\mathrel{\dot{\vee}} #2.”]

[$x \mathrel{\dot{\Leftrightarrow}} y$ $\stackrel{\text{tex}}{=}$ “#1.
\mathrel{\dot{\Leftrightarrow}} #2.”]

[{ph ∈ x | a} $\overset{\text{tex}}{=}$ “ \{ ph \mathrel{\in} #1.
\mid #2.
\}”]

[x ⇒ y $\overset{\text{tex}}{=}$ “(i#1.
\Rightarrow #2.
)i”]

[Nat(x) $\overset{\text{tex}}{=}$ “Nat(#1.
)”]

[$\langle$x≡y|z:==u$\rangle_{\mathrm{Me}}$ $\overset{\text{tex}}{=}$ “\langle #1.
{\equiv} #2.
| #3.
{:==} #4.
\rangle_{Me}”]

[$\langle$x$\equiv^1$y|z:==u$\rangle_{\mathrm{Me}}$ $\overset{\text{tex}}{=}$ “\langle #1.
{\equiv}^1 #2.
| #3.
{:==} #4.
\rangle_{Me} ”]

[$\langle$x$\equiv^*$y|z:==u$\rangle_{\mathrm{Me}}$ $\overset{\text{tex}}{=}$ “\langle #1.
{\equiv}^∗ #2.
| #3.
{:==} #4.
\rangle_{Me} ”]

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

[(x1) $\overset{\text{tex}}{=}$ “(x1)”]

[(x2) $\overset{\text{tex}}{=}$ “(x2)”]

[(y1) $\overset{\text{tex}}{=}$ “(y1)”]

[(y2) $\overset{\text{tex}}{=}$ “(y2)”]

[(v1) $\overset{\text{tex}}{=}$ “(v1)”]

[(v2) $\overset{\text{tex}}{=}$ “(v2)”]

[(v3) $\overset{\text{tex}}{=}$ “(v3)”]

[(v4) $\overset{\text{tex}}{=}$ “(v4)”]

$[(\text{v2n}) \stackrel{\text{tex}}{=} \text{“(v2n)”}]$

$[(\text{n1}) \stackrel{\text{tex}}{=} \text{“(n1)”}]$

$[(\text{n2}) \stackrel{\text{tex}}{=} \text{“(n2)”}]$

$[(\text{n3}) \stackrel{\text{tex}}{=} \text{“(n3)”}]$

$[(\text{m1}) \stackrel{\text{tex}}{=} \text{“(m1)”}]$

$[(\text{m2}) \stackrel{\text{tex}}{=} \text{“(m2)”}]$

$[(\epsilon) \stackrel{\text{tex}}{=} \text{“(\textbackslash epsilon)”}]$

$[(\epsilon)_1 \stackrel{\text{tex}}{=} \text{“(\textbackslash epsilon)\_\{1\}”}]$

$[(\epsilon 2) \stackrel{\text{tex}}{=} \text{“(\textbackslash epsilon 2)”}]$

$[(\text{fx}) \stackrel{\text{tex}}{=} \text{“(fx)”}]$

$[(\text{fy}) \stackrel{\text{tex}}{=} \text{“(fy)”}]$

$[(\text{fz}) \stackrel{\text{tex}}{=} \text{“(fz)”}]$

$[(\text{fu}) \stackrel{\text{tex}}{=} \text{“(fu)”}]$

$[(\text{fv}) \stackrel{\text{tex}}{=} \text{“(fv)”}]$

$[(\text{fw}) \stackrel{\text{tex}}{=} \text{“(fw)”}]$

$[(\text{fep}) \stackrel{\text{tex}}{=} \text{“(fep)”}]$

$[(\text{rx}) \stackrel{\text{tex}}{=} \text{“(rx)”}]$

$[(\text{ry}) \stackrel{\text{tex}}{=} \text{“(ry)”}]$

$[(\text{rz}) \stackrel{\text{tex}}{=} \text{“(rz)”}]$

$[(\text{ru}) \stackrel{\text{tex}}{=} \text{“(ru)”}]$

$[(\text{sx}) \stackrel{\text{tex}}{=} \text{“(sx)”}]$

$[(\text{sx1}) \stackrel{\text{tex}}{=} \text{“(sx1)”}]$

$[(\text{sy}) \stackrel{\text{tex}}{=} \text{“(sy)”}]$

$[(\text{sy1}) \stackrel{\text{tex}}{=} \text{“(sy1)”}]$

$[(\text{sz}) \stackrel{\text{tex}}{=} \text{“(sz)”}]$

[(sz1) $\stackrel{\text{tex}}{=}$ "(sz1)"]

[(su) $\stackrel{\text{tex}}{=}$ "(su)"]

[(su1) $\stackrel{\text{tex}}{=}$ "(su1)"]

[(fxs) $\stackrel{\text{tex}}{=}$ "(fxs)"]

[(fys) $\stackrel{\text{tex}}{=}$ "(fys)"]

[(crs1) $\stackrel{\text{tex}}{=}$ "(crs1)"]

[(f1) $\stackrel{\text{tex}}{=}$ "(f1)"]

[(f2) $\stackrel{\text{tex}}{=}$ "(f2)"]

[(f3) $\stackrel{\text{tex}}{=}$ "(f3)"]

[(f4) $\stackrel{\text{tex}}{=}$ "(f4)"]

[(op1) $\stackrel{\text{tex}}{=}$ "(op1)"]

[(op2) $\stackrel{\text{tex}}{=}$ "(op2)"]

[(r1) $\stackrel{\text{tex}}{=}$ "(r1)"]

[(s1) $\stackrel{\text{tex}}{=}$ "(s1)"]

[(s2) $\stackrel{\text{tex}}{=}$ "(s2)"]

[X_1 $\stackrel{\text{tex}}{=}$ "X_{1}"]

[X_2 $\stackrel{\text{tex}}{=}$ "X_{2}"]

[Y_1 $\stackrel{\text{tex}}{=}$ "Y_{1}"]

[Y_2 $\stackrel{\text{tex}}{=}$ "Y_{2}"]

[V_1 $\stackrel{\text{tex}}{=}$ "V_{1}"]

[V_2 $\stackrel{\text{tex}}{=}$ "V_{2}"]

[V_3 $\stackrel{\text{tex}}{=}$ "V_{3}"]

[V_4 $\stackrel{\text{tex}}{=}$ "V_{4}"]

[V_{2n} $\stackrel{\text{tex}}{=}$ "V_{2n}"]

[ϵ $\stackrel{\text{tex}}{=}$ "\epsilon"]

[$M_1 \stackrel{\text{tex}}{=}$ “M_{1}”]

[$M_2 \stackrel{\text{tex}}{=}$ “M_{2}”]

[$N_1 \stackrel{\text{tex}}{=}$ “N_{1} ”]

[$N_2 \stackrel{\text{tex}}{=}$ “N_{2} ”]

[$N_3 \stackrel{\text{tex}}{=}$ “N_{3} ”]

[$\epsilon 1 \stackrel{\text{tex}}{=}$ “\epsilon 1”]

[$\epsilon 2 \stackrel{\text{tex}}{=}$ “\epsilon 2”]

[FX $\stackrel{\text{tex}}{=}$ “FX”]

[FY $\stackrel{\text{tex}}{=}$ “FY”]

[FZ $\stackrel{\text{tex}}{=}$ “FZ”]

[FU $\stackrel{\text{tex}}{=}$ “FU”]

[FV $\stackrel{\text{tex}}{=}$ “FV”]

[FW $\stackrel{\text{tex}}{=}$ “FW”]

[FEP $\stackrel{\text{tex}}{=}$ “FEP”]

[RX $\stackrel{\text{tex}}{=}$ “RX”]

[RY $\stackrel{\text{tex}}{=}$ “RY”]

[RZ $\stackrel{\text{tex}}{=}$ “RZ”]

[RU $\stackrel{\text{tex}}{=}$ “RU”]

[(SX) $\stackrel{\text{tex}}{=}$ “(SX)”]

[(SX1) $\stackrel{\text{tex}}{=}$ “(SX1)”]

[(SY) $\stackrel{\text{tex}}{=}$ “(SY)”]

[(SY1) $\stackrel{\text{tex}}{=}$ “(SY1)”]

[(SZ) $\stackrel{\text{tex}}{=}$ “(SZ)”]

[(SZ1) $\stackrel{\text{tex}}{=}$ “(SZ1)”]

[(SU) $\stackrel{\text{tex}}{=}$ “(SU)”]

$[\text{(SU1)} \overset{\text{tex}}{=} \text{“(SU1)”}]$

$[\text{FXS} \overset{\text{tex}}{=} \text{“FXS”}]$

$[\text{FYS} \overset{\text{tex}}{=} \text{“FYS”}]$

$[\text{(F1)} \overset{\text{tex}}{=} \text{“(F1)”}]$

$[\text{(F2)} \overset{\text{tex}}{=} \text{“(F2)”}]$

$[\text{(F3)} \overset{\text{tex}}{=} \text{“(F3)”}]$

$[\text{(F4)} \overset{\text{tex}}{=} \text{“(F4)”}]$

$[\text{(OP1)} \overset{\text{tex}}{=} \text{“(OP1)”}]$

$[\text{(OP2)} \overset{\text{tex}}{=} \text{“(OP2)”}]$

$[\text{(R1)} \overset{\text{tex}}{=} \text{“(R1)”}]$

$[\text{(S1)} \overset{\text{tex}}{=} \text{“(S1)”}]$

$[\text{(S2)} \overset{\text{tex}}{=} \text{“(S2)”}]$

$[\text{(EPob)} \overset{\text{tex}}{=} \text{“(EPob)”}]$

$[\text{(CRS1ob)} \overset{\text{tex}}{=} \text{“(CRS1ob)”}]$

$[\text{(F1ob)} \overset{\text{tex}}{=} \text{“(F1ob)”}]$

$[\text{(F2ob)} \overset{\text{tex}}{=} \text{“(F2ob)”}]$

$[\text{(F3ob)} \overset{\text{tex}}{=} \text{“(F3ob)”}]$

$[\text{(F4ob)} \overset{\text{tex}}{=} \text{“(F4ob)”}]$

$[\text{(N1ob)} \overset{\text{tex}}{=} \text{“(N1ob)”}]$

$[\text{(N2ob)} \overset{\text{tex}}{=} \text{“(N2ob)”}]$

$[\text{(OP1ob)} \overset{\text{tex}}{=} \text{“(OP1ob)”}]$

$[\text{(OP2ob)} \overset{\text{tex}}{=} \text{“(OP2ob)”}]$

$[\text{(R1ob)} \overset{\text{tex}}{=} \text{“(R1ob)”}]$

$[\text{(S1ob)} \overset{\text{tex}}{=} \text{“(S1ob)”}]$

$[\text{(S2ob)} \overset{\text{tex}}{=} \text{“(S2ob)”}]$

[Ex3 $\stackrel{\text{tex}}{=}$ "Ex3"]

[NAT $\stackrel{\text{tex}}{=}$ "NAT"]

[RATIONAL$_{\text{S}}$ERIES $\stackrel{\text{tex}}{=}$ "RATIONAL_SERIES"]

[SERIES $\stackrel{\text{tex}}{=}$ "SERIES"]

[SetOfReals $\stackrel{\text{tex}}{=}$ "SetOfReals"]

[SetOfFxs $\stackrel{\text{tex}}{=}$ "SetOfFxs"]

[N $\stackrel{\text{tex}}{=}$ "N"]

[Q $\stackrel{\text{tex}}{=}$ "Q"]

[X $\stackrel{\text{tex}}{=}$ "X"]

[xs $\stackrel{\text{tex}}{=}$ "xs"]

[xaF $\stackrel{\text{tex}}{=}$ "xaF"]

[ysF $\stackrel{\text{tex}}{=}$ "ysF"]

[us $\stackrel{\text{tex}}{=}$ "us"]

[usFoelge $\stackrel{\text{tex}}{=}$ "usFoelge"]

[0 $\stackrel{\text{tex}}{=}$ "0"]

[1 $\stackrel{\text{tex}}{=}$ "1"]

[(-1) $\stackrel{\text{tex}}{=}$ "(-1)"]

[2 $\stackrel{\text{tex}}{=}$ "2"]

[3 $\stackrel{\text{tex}}{=}$ "3"]

[1/2 $\stackrel{\text{tex}}{=}$ "1/2"]

[1/3 $\stackrel{\text{tex}}{=}$ "1/3"]

[2/3 $\stackrel{\text{tex}}{=}$ "2/3"]

[0f $\stackrel{\text{tex}}{=}$ "0f"]

[00 $\stackrel{\text{tex}}{=}$ "00"]

[$(--01)$ $\stackrel{\text{tex}}{=}$ "(--01)"]

[$02 \stackrel{\text{tex}}{=}$ “02”]

[$01//02 \stackrel{\text{tex}}{=}$ “01//02”]

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

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

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

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

[$\mathsf{x} <_{\mathrm{f}} \mathsf{y} \stackrel{\text{tex}}{=}$ “#1.
<_{f}#2.”]

[$\mathsf{x} \leq_{\mathrm{f}} \mathsf{y} \stackrel{\text{tex}}{=}$ “#1.
\leq_{f}#2.”]

[$\mathrm{SF}(\mathsf{x}, \mathsf{y}) \stackrel{\text{tex}}{=}$ “SF(#1.
, #2.
)”]

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

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

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

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

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

[$(-\mathrm{u}\mathsf{x}) \stackrel{\text{tex}}{=}$ “(-u#1.
)”]

[$-_{\mathrm{f}}\mathsf{x} \stackrel{\text{tex}}{=}$ “-_{f}#1.”]

$[(--\mathsf{x}) \stackrel{\text{tex}}{=}$ "(--#1.
)"]

$[1f/\mathsf{x} \stackrel{\text{tex}}{=}$ "1f/#1."]

$[01//\text{temp}\mathsf{x} \stackrel{\text{tex}}{=}$ "01//temp#1."]

$[(\mathsf{x}+\mathsf{y}) \stackrel{\text{tex}}{=}$ "(#1.
+#2.
)"]

$[(\mathsf{x}-\mathsf{y}) \stackrel{\text{tex}}{=}$ "(#1.
-#2.
)"]

$[(\text{fx}) +_{\text{f}} (\text{fy}) \stackrel{\text{tex}}{=}$ "#1.
+_{f}#2."]

$[(\text{fx}) -_{\text{f}} (\text{fy}) \stackrel{\text{tex}}{=}$ "#1.
-_{f}#2."]

$[(\text{fx}) *_{\text{f}} (\text{fy}) \stackrel{\text{tex}}{=}$ "#1.
*_{f}#2."]

$[\mathsf{x}++\mathsf{y} \stackrel{\text{tex}}{=}$ "#1.
++#2."]

$[\text{R}((\text{fx}))--\text{R}((\text{fy})) \stackrel{\text{tex}}{=}$ "R(#1.
) -- R(#2.
)"]

$[(\mathsf{x}*\mathsf{y}) \stackrel{\text{tex}}{=}$ "(#1.
*#2.
)"]

$[\mathsf{x}**\mathsf{y} \stackrel{\text{tex}}{=}$ "#1.
**#2."]

$[\mathsf{x}(\text{exp})\mathsf{y} \stackrel{\text{tex}}{=}$ " #1.
(exp) #2."]

$[\text{leqReflexivity} \stackrel{\text{tex}}{=}$ "leqReflexivity"]

$[\text{rec}\mathsf{x} \stackrel{\text{tex}}{=}$ "rec#1."]

$[|\mathsf{x}| \stackrel{\text{tex}}{=}$ "|#1.
|"]

$[\mathrm{StateExpand}(\mathsf{t},\mathsf{s},\mathsf{c}) \stackrel{\text{tex}}{=}$ "StateExpand(#1.
, #2.
, #3.
)"]

$[\mathrm{extractSeries}(\mathsf{t}) \stackrel{\text{tex}}{=}$ "extractSeries(#1.
)"]

$[|\mathrm{f}\mathsf{x}| \stackrel{\text{tex}}{=}$ "|f#1.
|"]

$[|\mathrm{r}\mathsf{x}| \stackrel{\text{tex}}{=}$ "|r#1.
|"]

$[\mathrm{SetOfSeries}(\mathsf{x}) \stackrel{\text{tex}}{=}$ "SetOfSeries(#1.
)"]

$[\mathrm{ExpandList}(\mathsf{x},\mathsf{y},\mathsf{z}) \stackrel{\text{tex}}{=}$ "ExpandList(#1.
, #2.
, #3.
)"]

$[* * \mathrm{Macro}(\mathsf{x}) \stackrel{\text{tex}}{=}$ "**Macro(#1.
)"]

$[+ + \mathrm{Macro}(\mathsf{x}) \stackrel{\text{tex}}{=}$ "++Macro(#1.
)"]

$[- - \mathrm{Macro}(\mathsf{x}) \stackrel{\text{tex}}{=}$ "--Macro(#1.
)"]

$[<< \mathrm{Macro}(\mathsf{x}) \stackrel{\text{tex}}{=}$ "<<Macro(#1.
)"]

$[||\mathrm{Macro}(\mathsf{x}) \stackrel{\text{tex}}{=}$ "||Macro(#1.
)"]

$[01//\mathrm{Macro}(\mathsf{x}) \stackrel{\text{tex}}{=}$ "01//Macro(#1.
)"]

$[\mathrm{Max}(\mathsf{x},\mathsf{y}) \stackrel{\text{tex}}{=}$ "Max(#1.
, #2.
)"]

$[\mathrm{Max}(\mathsf{x},\mathsf{y}) \stackrel{\text{tex}}{=}$ "Max(#1.
, #2.
)"]

[Limit$(\mathsf{x},\mathsf{y}) \stackrel{\text{tex}}{=}$ "Limit(#1.
, #2.
)"]

[Union$(\mathsf{x}) \stackrel{\text{tex}}{=}$ "Union(#1.
)"]

[if$(\mathsf{x},\mathsf{y},\mathsf{z}) \stackrel{\text{tex}}{=}$ "if(#1.
, #2.
, #3.
)"]

[IsOrderedPair$(\mathsf{x},\mathsf{y},\mathsf{z}) \stackrel{\text{tex}}{=}$ "IsOrderedPair(#1.
, #2.
, #3.
)"]

[IsRelation$(\mathsf{x},\mathsf{y},\mathsf{z}) \stackrel{\text{tex}}{=}$ "IsRelation(#1.
, #2.
, #3.
)"]

[isFunction$(\mathsf{x},\mathsf{y},\mathsf{z}) \stackrel{\text{tex}}{=}$ "isFunction(#1.
, #2.
, #3.
)"]

[TypeNat$(\mathsf{x}) \stackrel{\text{tex}}{=}$ "TypeNat(#1.
)"]

[TypeNat0$(\mathsf{x}) \stackrel{\text{tex}}{=}$ "TypeNat0(#1.
)"]

[TypeRational$(\mathsf{x}) \stackrel{\text{tex}}{=}$ "TypeRational(#1.
)"]

[TypeRational0$(\mathsf{x}) \stackrel{\text{tex}}{=}$ "TypeRational0(#1.
)"]

[TypeSeries$(\mathsf{x},\mathsf{y}) \stackrel{\text{tex}}{=}$ "TypeSeries(#1.
, #2.
)"]

[Typeseries0$(\mathsf{x},\mathsf{y}) \stackrel{\text{tex}}{=}$ "Typeseries0(#1.
, #2.
)"]

[UB(x, y) $\stackrel{\text{tex}}{=}$ "UB(#1.
, #2.
)"]

[LUB(x, y) $\stackrel{\text{tex}}{=}$ "LUB(#1.
, #2.
)"]

[BS(x, y) $\stackrel{\text{tex}}{=}$ "BS(#1.
, #2.
)"]

[UStelescope(x, y) $\stackrel{\text{tex}}{=}$ "UStelescope(#1.
, #2.
)"]

[(x) $\stackrel{\text{tex}}{=}$ "(#1.
)"]

[R(x) $\stackrel{\text{tex}}{=}$ "R(#1.
)"]

[− − R(x) $\stackrel{\text{tex}}{=}$ "--R(#1.
)"]

[IsSeries(x, y) $\stackrel{\text{tex}}{=}$ "IsSeries(#1.
, #2.
)"]

[IsNatural(xy, ∗) $\stackrel{\text{tex}}{=}$ "IsNatural(#1.
, #2.
)"]

[OrderedPair(x, y) $\stackrel{\text{tex}}{=}$ "OrderedPair(#1.
, #2.
)"]

[leqAntisymmetryAxiom $\stackrel{\text{tex}}{=}$ "leqAntisymmetryAxiom"]

[leqTransitivityAxiom $\stackrel{\text{tex}}{=}$ "leqTransitivityAxiom"]

[leqTotality $\stackrel{\text{tex}}{=}$ "leqTotality"]

[leqAdditionAxiom $\stackrel{\text{tex}}{=}$ "leqAdditionAxiom"]

[leqMultiplicationAxiom $\stackrel{\text{tex}}{=}$ "leqMultiplicationAxiom"]

[plusAssociativity $\stackrel{\text{tex}}{=}$ "plusAssociativity"] [plusCommutativity $\stackrel{\text{tex}}{=}$ “plusCommutativity”]

[Negative $\stackrel{\text{tex}}{=}$ “Negative”]

[plus0 $\stackrel{\text{tex}}{=}$ “plus0”]

[timesAssociativity $\stackrel{\text{tex}}{=}$ “timesAssociativity”]

[timesCommutativity $\stackrel{\text{tex}}{=}$ “timesCommutativity”]

[ReciprocalAxiom $\stackrel{\text{tex}}{=}$ “ReciprocalAxiom”]

[times1 $\stackrel{\text{tex}}{=}$ “times1”]

[plusAssociativity $\stackrel{\text{tex}}{=}$ “plusAssociativity”]

[plusCommutativity $\stackrel{\text{tex}}{=}$ “plusCommutativity”]

[Negative $\stackrel{\text{tex}}{=}$ “Negative”]

[Distribution $\stackrel{\text{tex}}{=}$ “Distribution”]

[0not1 $\stackrel{\text{tex}}{=}$ “0not1”]

[A4(Axiom) $\stackrel{\text{tex}}{=}$ “A4(Axiom)”]

[InductionAxiom $\stackrel{\text{tex}}{=}$ “InductionAxiom”]

[EqualityAxiom $\stackrel{\text{tex}}{=}$ “EqualityAxiom”]

[EqLeqAxiom $\stackrel{\text{tex}}{=}$ “EqLeqAxiom”]

[EqAdditionAxiom $\stackrel{\text{tex}}{=}$ “EqAdditionAxiom”]

[EqMultiplicationAxiom $\stackrel{\text{tex}}{=}$ “EqMultiplicationAxiom”]

[SENC1 $\stackrel{\text{tex}}{=}$ “SENC1”]

[SENC2 $\stackrel{\text{tex}}{=}$ “SENC2”]

[Cauchy $\stackrel{\text{tex}}{=}$ “Cauchy”]

[PlusF $\stackrel{\text{tex}}{=}$ “PlusF”]

[ReciprocalF $\stackrel{\text{tex}}{=}$ “ReciprocalF”]

[From ==$\stackrel{\text{tex}}{=}$ “From==”]

[To ==$\stackrel{\text{tex}}{=}$ “To==”]

[FromInR $\overset{\text{tex}}{=}$ "FromInR"]

[ReciprocalR(Axiom) $\overset{\text{tex}}{=}$ "ReciprocalR(Axiom)"]

[US0 $\overset{\text{tex}}{=}$ "US0"]

[NextXS(UpperBound) $\overset{\text{tex}}{=}$ "NextXS(UpperBound)"]

[NextXS(NoUpperBound) $\overset{\text{tex}}{=}$ "NextXS(NoUpperBound)"]

[NextUS(UpperBound) $\overset{\text{tex}}{=}$ "NextUS(UpperBound)"]

[NextUS(NoUpperBound) $\overset{\text{tex}}{=}$ "NextUS(NoUpperBound)"]

[ExpZero $\overset{\text{tex}}{=}$ "ExpZero"]

[ExpPositive $\overset{\text{tex}}{=}$ "ExpPositive"]

[ExpZero(R) $\overset{\text{tex}}{=}$ "ExpZero(R)"]

[ExpPositive(R) $\overset{\text{tex}}{=}$ "ExpPositive(R)"]

[LessMinus1(N) $\overset{\text{tex}}{=}$ "LessMinus1(N)"]

[Nonnegative(N) $\overset{\text{tex}}{=}$ "Nonnegative(N)"]

[BSzero $\overset{\text{tex}}{=}$ "BSzero"]

[BSpositive $\overset{\text{tex}}{=}$ "BSpositive"]

[UStelescope(Zero) $\overset{\text{tex}}{=}$ "UStelescope(Zero)"]

[UStelescope(Positive) $\overset{\text{tex}}{=}$ "UStelescope(Positive)"]

[EqAddition(R) $\overset{\text{tex}}{=}$ "EqAddition(R)"]

[FromLimit $\overset{\text{tex}}{=}$ "FromLimit"]

[ToUpperBound $\overset{\text{tex}}{=}$ "ToUpperBound"]

[FromUpperBound $\overset{\text{tex}}{=}$ "FromUpperBound"]

[USisUpperBound $\overset{\text{tex}}{=}$ "USisUpperBound"]

[0not1(R) $\overset{\text{tex}}{=}$ "0not1(R)"]

[ExpUnbounded(R) $\overset{\text{tex}}{=}$ "ExpUnbounded(R)"]

[FromLeq(Advanced)(N) $\overset{\text{tex}}{=}$ "FromLeq(Advanced)(N)"]

$[\text{FromLeastUpperBound} \stackrel{\text{tex}}{=} \text{“FromLeastUpperBound”}]$

$[\text{ToLeastUpperBound} \stackrel{\text{tex}}{=} \text{“ToLeastUpperBound”}]$

$[\text{XSisNotUpperBound} \stackrel{\text{tex}}{=} \text{“XSisNotUpperBound”}]$

$[\text{ysFGreater} \stackrel{\text{tex}}{=} \text{“ysFGreater”}]$

$[\text{ysFLess} \stackrel{\text{tex}}{=} \text{“ysFLess”}]$

$[\text{SmallInverse} \stackrel{\text{tex}}{=} \text{“SmallInverse”}]$

$[\text{MemberOfSeries(Imply)} \stackrel{\text{tex}}{=} \text{“MemberOfSeries(Imply)”}]$

$[\text{NatType} \stackrel{\text{tex}}{=} \text{“NatType”}]$

$[\text{RationalType} \stackrel{\text{tex}}{=} \text{“RationalType”}]$

$[\text{SeriesType} \stackrel{\text{tex}}{=} \text{“SeriesType”}]$

$[\text{JoinConjuncts(2conditions)} \stackrel{\text{tex}}{=} \text{“JoinConjuncts(2conditions)”}]$

$[\text{TND} \stackrel{\text{tex}}{=} \text{“TND”}]$

$[\text{FromNegatedImply} \stackrel{\text{tex}}{=} \text{“FromNegatedImply”}]$

$[\text{ToNegatedImply} \stackrel{\text{tex}}{=} \text{“ToNegatedImply”}]$

$[\text{FromNegated}(2 * \text{Imply}) \stackrel{\text{tex}}{=} \text{“FromNegated(2*Imply)”}]$

$[\text{FromNegatedAnd} \stackrel{\text{tex}}{=} \text{“FromNegatedAnd”}]$

$[\text{FromNegatedOr} \stackrel{\text{tex}}{=} \text{“FromNegatedOr”}]$

$[\text{ToNegatedOr} \stackrel{\text{tex}}{=} \text{“ToNegatedOr”}]$

$[\text{FromNegations} \stackrel{\text{tex}}{=} \text{“FromNegations”}]$

$[\text{From3Disjuncts} \stackrel{\text{tex}}{=} \text{“From3Disjuncts”}]$

$[\text{NegateDisjunct1} \stackrel{\text{tex}}{=} \text{“NegateDisjunct1”}]$

$[\text{NegateDisjunct2} \stackrel{\text{tex}}{=} \text{“NegateDisjunct2”}]$

$[\text{ExpandDisjuncts} \stackrel{\text{tex}}{=} \text{“ExpandDisjuncts”}]$

$[\text{From2} * \text{2Disjuncts} \stackrel{\text{tex}}{=} \text{“From2*2Disjuncts”}]$

$[\text{PlusR(Sym)} \stackrel{\text{tex}}{=} \text{“PlusR(Sym)”}]$

[LessLeq(R) $\stackrel{\text{tex}}{=}$ "LessLeq(R)"]

[LeqAntisymmetry(R) $\stackrel{\text{tex}}{=}$ "LeqAntisymmetry(R)"]

[LeqTransitivity(R) $\stackrel{\text{tex}}{=}$ "LeqTransitivity(R)"]

[Plus0(R) $\stackrel{\text{tex}}{=}$ "Plus0(R)"]

[lessAddition(R) $\stackrel{\text{tex}}{=}$ "lessAddition(R)"]

[leqAddition(R) $\stackrel{\text{tex}}{=}$ "leqAddition(R)"]

[PlusAssociativity(R)XX $\stackrel{\text{tex}}{=}$ "PlusAssociativity(R)XX"]

[PlusAssociativity(R) $\stackrel{\text{tex}}{=}$ "PlusAssociativity(R)"]

[Negative(R) $\stackrel{\text{tex}}{=}$ "Negative(R)"]

[PlusCommutativity(R) $\stackrel{\text{tex}}{=}$ "PlusCommutativity(R)"]

[Times1(R) $\stackrel{\text{tex}}{=}$ "Times1(R)"]

[TimesAssociativity(R) $\stackrel{\text{tex}}{=}$ "TimesAssociativity(R)"]

[TimesCommutativity(R) $\stackrel{\text{tex}}{=}$ "TimesCommutativity(R)"]

[Distribution(R) $\stackrel{\text{tex}}{=}$ "Distribution(R)"]

[$\exists \mathsf{x} \colon \mathsf{y}$ $\stackrel{\text{tex}}{=}$ "(AARRGGHH!-exist-bug!)"]

[constantRationalSeries(x) $\stackrel{\text{tex}}{=}$ "constantRationalSeries(#1.
)"]

[Power(x) $\stackrel{\text{tex}}{=}$ "Power(#1.
)"]

[cartProd(x) $\stackrel{\text{tex}}{=}$ "cartProd(#1.
)"]

[binaryUnion(x, y) $\stackrel{\text{tex}}{=}$ "binaryUnion(#1.
, #2.
)"]

[SetOfRationalSeries $\stackrel{\text{tex}}{=}$ "SetOfRationalSeries"]

[MemberOfSeries $\stackrel{\text{tex}}{=}$ "MemberOfSeries"]

[IsSubset(x, y) $\stackrel{\text{tex}}{=}$ "IsSubset(#1.
, #2.
)"]

[memberOfSeries(Type) $\stackrel{\text{tex}}{=}$ "memberOfSeries(Type)"]

[UniqueMember $\stackrel{\text{tex}}{=}$ "UniqueMember"]

[UniqueMember(Type) $\stackrel{\text{tex}}{=}$ "UniqueMember(Type)"]

[SameSeries $\stackrel{\text{tex}}{=}$ "SameSeries"]

[A4 $\stackrel{\text{tex}}{=}$ "A4"]

[(sx) $\stackrel{\text{tex}}{=}$ "(s#1.
)"]

[(px, y) $\stackrel{\text{tex}}{=}$ "(p#1.
, #2.
)"]

[SameMember $\stackrel{\text{tex}}{=}$ "SameMember"]

[Qclosed(Addition) $\stackrel{\text{tex}}{=}$ "Qclosed(Addition)"]

[Qclosed(Multiplication) $\stackrel{\text{tex}}{=}$ "Qclosed(Multiplication)"]

[FromCartProd(1) $\stackrel{\text{tex}}{=}$ "FromCartProd(1)"]

[FromCartProd(1) $\stackrel{\text{tex}}{=}$ "FromCartProd(1)"]

[Max $\stackrel{\text{tex}}{=}$ "Max"]

[Numerical $\stackrel{\text{tex}}{=}$ "Numerical"]

[NumericalF $\stackrel{\text{tex}}{=}$ "NumericalF"]

[Separation2formula(1) $\stackrel{\text{tex}}{=}$ "Separation2formula(1)"]

[Separation2formula(2) $\stackrel{\text{tex}}{=}$ "Separation2formula(2)"]

[QisClosed(Reciprocal)(Imply) $\stackrel{\text{tex}}{=}$ "QisClosed(Reciprocal)(Imply)"]

[QisClosed(Reciprocal) $\stackrel{\text{tex}}{=}$ "QisClosed(Reciprocal)"]

[QisClosed(Negative)(Imply) $\stackrel{\text{tex}}{=}$ "QisClosed(Negative)(Imply)"]

[QisClosed(Negative) $\stackrel{\text{tex}}{=}$ "QisClosed(Negative)"]

$[(\text{Adgic})\text{SameR} \stackrel{\text{tex}}{=} \text{“(Adgic)SameR”}]$