$$\underline{G}^{\pi} \ni \psi$$

$$\psi \star \phi = \int\limits_{da} {}^{a}\bar{\psi}\; {}^{a}\phi$$

$$ {}^{a}\overbrace{k^{\pi}\psi} = \int\limits_{db} {}^{a}k^{\pi}_{b}\; {}^{b}\psi$$

$$\int\limits_{da} {}^{a}\bar{k}^{\pi}_{b}\; {}^{a}k^{\pi}_{c} = {}^{b}\delta_{c}$$

$$\underline{G}^{\pi} \xleftarrow[K\ \mathrm{inv}]{\mathcal{I}} H\neg K \,\triangle^{2}\,\mathbb{C}$$

$$ {}^{u}\overbrace{k^{\varrho}\eta} = {}^{uk}\eta$$

$$\mathcal{I}\underbrace{k^{\varrho}\eta} = k^{\pi}\,\underbrace{\mathcal{I}\eta}$$

$$\eta \underset{\pi}{\star} \theta = \underbrace{\mathcal{I}\eta}\star\underbrace{\mathcal{I}\theta}$$

$$ {}^{a}\overbrace{\mathcal{I}\eta} = \int\limits_{du}^{H\neg K} {}^{a}\mathcal{I}_{u}\; {}^{u}\eta$$

$$ {}^{a}\mathcal{I}_{uk^{-1}} = \int\limits_{db} {}^{a}k^{\pi}_{b}\; {}^{b}\mathcal{I}_{u}$$

$$\int\limits_{du}^{H\neg K} {}^{a}\mathcal{I}_{uk^{-1}}\; {}^{u}\eta = \int\limits_{dv}^{H\neg K} {}^{a}\mathcal{I}_{v}\; {}^{vk}\eta = \int\limits_{dv}^{H\neg K} {}^{a}\mathcal{I}_{v}\; {}^{v}\overbrace{k^{\varrho}\eta} = {}^{a}\overbrace{\mathcal{I}\underbrace{k^{\varrho}\eta}}$$

$$= {}^{a}\overbrace{k^{\pi}\underbrace{\mathcal{I}\eta}} = \int\limits_{db} {}^{a}k^{\pi}_{b}\; {}^{b}\overbrace{\mathcal{I}\eta} = \int\limits_{db} {}^{a}k^{\pi}_{b} \int\limits_{du}^{H\neg K} {}^{b}\mathcal{I}_{u}\; {}^{u}\eta = \int\limits_{du}^{H\neg K} \int\limits_{db} {}^{a}k^{\pi}_{b}\; {}^{b}\mathcal{I}_{u}\; {}^{u}\eta$$

$$ {}^{u}\mathcal{I}_{v} = \int\limits_{da} {}^{a}\bar{\mathcal{I}}_{u}\; {}^{a}\mathcal{I}_{v} = \int\limits_{da} {}^{u}\mathcal{I}_{a}\; {}^{a}\mathcal{I}_{v}$$

$$\urcorner \underset{\pi}{\bowtie} \daleth = \int\limits_{du}^{H\neg K} \int\limits_{dv}^{H\neg K} {}^{u}\bar{\urcorner}\, {}^{u}\mathcal{I}_{v}\, {}^{v}\daleth$$

$$\text{LHS } = \underbrace{\mathcal{I}\urcorner} \bowtie \underbrace{\mathcal{I}\daleth} = \int\limits_{da} {}^{a}\overline{\mathcal{I}\urcorner}\; {}^{a}\overset{\frown}{\mathcal{I}\daleth} = \int\limits_{da} \int\limits_{du}^{H\neg K} \overline{{}^{a}\mathcal{I}_{u}\, {}^{u}\urcorner} \int\limits_{dv}^{H\neg K} {}^{a}\mathcal{I}_{v}\, {}^{v}\daleth = \int\limits_{du}^{H\neg K} {}^{u}\bar{\urcorner} \int\limits_{dv}^{H\neg K} {}^{v}\daleth \int\limits_{da} {}^{a}\bar{\mathcal{I}}_{u}\, {}^{a}\mathcal{I}_{v} = \text{ RHS}$$

$${}^{uk}\mathcal{I}_{vk} = {}^{u}\mathcal{I}_{v}$$

$${}^{uk^{-1}}\mathcal{I}_{vk^{-1}} = \int\limits_{da} {}^{a}\bar{\mathcal{I}}_{uk^{-1}}\, {}^{a}\mathcal{I}_{vk^{-1}} = \int\limits_{da} \overline{\int\limits_{db} {}^{a}k_{b}^{\pi\, b}\mathcal{I}_{u}} \int\limits_{dc} {}^{a}k_{c}^{\pi}\, {}^{c}\mathcal{I}_{v}$$

$$= \int\limits_{da} \int\limits_{db} {}^{a}\bar{k}_{b}^{\pi}\, {}^{b}\bar{\mathcal{I}}_{u} \int\limits_{dc} {}^{a}k_{c}^{\pi}\, {}^{c}\mathcal{I}_{v} = \int\limits_{db} \int\limits_{dc} \frac{\int\limits_{da} {}^{a}\bar{k}_{b}^{\pi\, a}k_{c}^{\pi}}{2} \left(= {}^{b}\delta_{c}\right) {}^{b}\bar{\mathcal{I}}_{u}\, {}^{c}\mathcal{I}_{v} = \int\limits_{db} {}^{b}\bar{\mathcal{I}}_{u}\, {}^{b}\mathcal{I}_{v} = {}^{u}\mathcal{I}_{v}$$

$${}^{u}\overset{\frown}{\mathcal{I}_{o}} = {}^{u}\mathcal{I}_{o} = \int\limits_{da} {}^{u}\mathcal{I}_{a}\, {}^{a}\mathcal{I}_{o}$$

$$\bigwedge_{H}^{h} {}^{uh}\mathcal{I}_{o} = {}^{u}\mathcal{I}_{o}$$

$${}^{uh}\mathcal{I}_{o} = {}^{uh}\mathcal{I}_{oh} = {}^{u}\mathcal{I}_{o}$$

$$v = ok = o\acute{k} \Longrightarrow {}^{u}\mathcal{I}_{v} = {}^{uk^{-1}}\mathcal{I}_{o} = {}^{u/v}\mathcal{I}_{o}$$

$${}^{u}\mathcal{I}_{v} = {}^{u}\mathcal{I}_{ok} = {}^{uk^{-1}}\mathcal{I}_{o}$$

$$v = ok = o\acute{k} \Longrightarrow \acute{k} = hk \Longrightarrow u\acute{k}^{-1} = u\,k^{-1}\,h^{-1} \Longrightarrow {}^{u\acute{k}^{-1}}\mathcal{I}_{o} = {}^{uk^{-1}h^{-1}}\mathcal{I}_{o} = {}^{uk^{-1}}\mathcal{I}_{o}$$

$$
{}^{u}\overbrace{\mathcal{I}_o \ast \urcorner} = \int\limits_{dk}^{K} {}^{uk^{-1}}\mathcal{I}_o{}^{ok}\urcorner \underset{v\,=\,ok}{=} \int\limits_{dv}^{H\urcorner K} {}^{u}\mathcal{I}_v{}^{v}\urcorner
$$

$$
\urcorner \Join \underbrace{\mathcal{I}_o \ast \intercal} = \urcorner \underset{\pi}{\Join} \intercal
$$

$$
\text{LHS} = \int\limits_{du}^{H\urcorner K} {}^{u^{-}}\urcorner\, {}^{u}\overbrace{\mathcal{I}_o \ast \intercal} = \int\limits_{du}^{H\urcorner K} {}^{u^{-}}\urcorner \int\limits_{dv}^{H\urcorner K} {}^{u}\mathcal{I}_v{}^{v}\intercal = \int\limits_{du}^{H\urcorner K} \int\limits_{dv}^{H\urcorner K} {}^{u^{-}}\urcorner\, {}^{u}\mathcal{I}_v{}^{v}\intercal = \text{RHS}
$$

$$
{}^{u}\mathcal{I}_o = H \underset{\lambda}{\overset{u}{\urcorner}} K \, \underset{\sim}{\mathcal{I}}{}_o^{\lambda} \int\limits_{H \overset{\sharp}{\urcorner} K}^{d\lambda}
$$

$$
\underset{\sim}{\mathcal{I}}{}_o^{\lambda} = \int\limits_{du}^{H\urcorner K} \overline{H \underset{\lambda}{\overset{u}{\urcorner}} K}\, {}^{u}\mathcal{I}_o
$$