$$\underset{\omega}{\mathfrak{G}}|_{\upsilon}\mathbb{L} = \underset{\omega}{\mathfrak{G}}^{O}_{1}|_{\upsilon}\mathbb{L} \times \underset{\omega}{\mathfrak{G}}^{O}_{-}|_{\upsilon}\mathbb{L} \times \sum_{\P \neq 0} \underset{\omega}{\mathfrak{G}}^{\P}|_{\upsilon}\mathbb{L}$$

$$= \underset{\omega}{\mathfrak{G}}^{O}|_{\upsilon}\mathbb{L} \times \sum_{1 \leqslant i < j \leqslant r} \underset{\omega}{\mathfrak{G}}^{\varkappa}_{j-i}|_{\upsilon}\mathbb{L} \times \sum_{0 \leqslant i \leqslant j \leqslant r} \underset{\omega}{\mathfrak{G}}^{\varkappa}_{j+i}|_{\upsilon}\mathbb{L}$$

$$\underset{\omega}{\mathfrak{G}}^{O}_{-}|_{\upsilon}\mathbb{L} = \mathbb{R}\frac{\overbrace{e_k - z e_k^* z}\,\partial_z}{1 \leqslant k \leqslant r} \xrightarrow{\P} \mathbb{R}$$

$$\underset{\omega}{\mathfrak{G}}^{O}_{1}|_{\upsilon}\mathbb{L} = \frac{\delta \in \Theta(X)}{e_k \delta = 0}$$

$$\underset{\omega}{\mathfrak{G}}^{\varkappa}_{j-i}|_{\upsilon}\mathbb{L} = \frac{X_a^- + 2\varkappa \underbrace{\overset{*}{a} e_j - \overset{*}{e}_j a}}{a = \overset{*}{a} \in {}^{i}\mathbb{L}_j} : \quad 0 < i < j$$

$$\overset{*}{a}\, e_j - \overset{*}{e}_j a = \overset{*}{e}_i a - \overset{*}{a}\, e_i = \underbrace{e_i \overset{*}{-} e_j}\, a = \overset{*}{a}\, \underbrace{e_j - e_i}$$

$$\underset{\omega}{\mathfrak{G}}^{\varkappa}_{j+i}|_{\upsilon}\mathbb{L} = \frac{X_a^- + 2\varkappa \underbrace{\overset{*}{a} e_j - \overset{*}{e}_j a}}{a = -\overset{*}{a} \in {}^{i}\mathbb{L}_j} : \quad i < j$$

$$\overset{*}{a}\, e_j - \overset{*}{e}_j a = \overset{*}{a}\, e_i - \overset{*}{e}_i a = \overset{*}{a}\, \underbrace{e_j + e_i} = -\underbrace{e_j \overset{*}{+} e_i}\, a = \overset{*}{a} e = -\overset{*}{e} a$$

$$\underset{\omega}{\mathfrak{G}}^{\varkappa}_{2j}|_{\upsilon}\mathbb{L} = \frac{X_a^- + \varkappa \underbrace{\overset{*}{a} e_j - \overset{*}{e}_j a}}{a = -\overset{*}{a} \in {}^{j}\mathbb{L}_j}$$

$$\overset{*}{a}\, e_j - \overset{*}{e}_j a = 2\overset{*}{a}\, e_j = -2\overset{*}{e}_j a = 2\overset{*}{a} e = -2\overset{*}{e} a$$

$$\mathfrak{E}^{\varkappa}_{\varpi\, j}\,|\,{}_{\mho}\mathbb{I} \;=\; \frac{X^{-}_{a} + 2\varkappa\,\underbrace{\mathring{a}^{*}e_{j} - \mathring{e}^{*}_{j}a}}{a \in {}^{0}\mathbb{L}_{j}} \colon \quad 0 = i < j$$

$$\mathring{a}^{*}\,e_{j} - \mathring{e}^{*}_{j}\,a = \mathring{a}^{*}\,e - \mathring{e}^{*}\,a$$

$$\mathfrak{E}^{\P}_{\varpi}\,|\,{}_{\mho}\mathbb{I} \;=\; \frac{\mathfrak{b} \in \mathfrak{E}_{\varpi}|_{\mho}\mathbb{I}}{\mathfrak{b} \times \underbrace{e_{k} - \mathring{e}^{*}_{k}} \;=\; \overbrace{\underbrace{e_{k} - \mathring{e}^{*}_{k}}\P}\,\mathfrak{b}}$$

$$\mathfrak{E}^{\varkappa}_{\varpi\, j\,-\,\varepsilon i}\,|\,{}_{\mho}\mathbb{I} \;=\; \mathfrak{E}_{\varpi}^{\varkappa\,\overbrace{\delta^{j} - \varepsilon\delta^{i}}}\,|\,{}_{\mho}\mathbb{I} \;=\; \frac{X^{-}_{a} + \varepsilon i \natural j\,\underbrace{\mathring{a}^{*}e_{j} - \mathring{e}^{*}_{j}a}}{a \in {}^{i}\mathbb{L}_{j} \colon \quad \mathring{a}^{*} = \varepsilon i} \colon \quad \varepsilon = 1{:}0{:} - 1$$

$$\underbrace{e_{k} - \mathring{e}^{*}_{k}}\P = \varkappa\,\underbrace{\partial^{j}_{k} - \varepsilon\delta^{i}_{k}}$$

$$X^{-}_{a} \times X^{-}_{b} = 2\,\underbrace{\mathring{a}^{*}b - \mathring{b}^{*}a}$$

$$X^{-}_{a} \times \underbrace{\mathring{b}^{*}c - \mathring{c}^{*}b} \;=\; X^{-}_{\underbrace{a\mathring{b}^{*}c - a\mathring{c}^{*}b}}$$

$$\overbrace{X^{-}_{a} + \varepsilon i \natural j\,\underbrace{\mathring{a}^{*}e_{j} - \mathring{e}^{*}_{j}a}} \times X^{-}_{e_{k}} = 2\,\underbrace{\mathring{a}^{*}e_{k} - \mathring{e}^{*}_{k}a} + \varepsilon i \natural j\,X^{-}_{\underbrace{e_{k}\mathring{e}^{*}_{j}a - e_{k}\mathring{a}^{*}e_{j}}}$$

$$1 \leqslant i < j \leqslant r \Longrightarrow \text{ RHS } = 2\,\overbrace{\delta^{i}_{k}\underbrace{\mathring{a}^{*}e_{i} - \mathring{e}^{*}_{i}a} + \delta^{j}_{k}\underbrace{\mathring{a}^{*}e_{j} - \mathring{e}^{*}_{j}a}} + 2\varkappa\,X^{-}_{\underbrace{\delta^{j}_{k}e_{j}\mathring{e}^{*}_{j}a - \delta^{i}_{k}e_{i}\mathring{e}^{*}_{i}a}} =$$

$$2\,\overbrace{\delta^{i}_{k}\underbrace{\mathring{e}^{*}_{j}\mathring{a}^{*} - \mathring{a}^{*}e_{j}} + \delta^{j}_{k}\underbrace{\mathring{a}^{*}e_{j} - \mathring{e}^{*}_{j}a}} + \varkappa\,X^{-}_{\underbrace{\delta^{j}_{k}a - \delta^{i}_{k}\mathring{a}^{*}}} = \varkappa\,\underbrace{\partial^{j}_{k} - \varepsilon\delta^{i}_{k}}\,\overbrace{X^{-}_{a} + 2\varkappa\,\underbrace{\mathring{a}^{*}e_{j} - \mathring{e}^{*}_{j}a}}$$

$$1 \leqslant i = j \leqslant r \Longrightarrow \text{ RHS } = 2\,\delta^{j}_{k}\,\underbrace{\mathring{a}^{*}e_{j} - \mathring{e}^{*}_{j}a} + \varkappa\,X^{-}_{\underbrace{\delta^{j}_{k}e_{j}\mathring{e}^{*}_{j}a - \delta^{j}_{k}e_{j}\mathring{a}^{*}e_{j}}} =$$

$$2\,\delta^{j}_{k}\,\underbrace{\mathring{a}^{*}e_{j} - \mathring{e}^{*}_{j}a} + \varkappa\,\delta^{j}_{k}\,X^{-}_{\underbrace{a - \mathring{a}^{*}}} = 2\varkappa\,\delta^{j}_{k}\,\overbrace{X^{-}_{a} + \varkappa\,\underbrace{\mathring{a}^{*}e_{j} - \mathring{e}^{*}_{j}a}}$$

$$0 = i < j \Longrightarrow \text{ RHS } = 2\,\delta^{j}_{k}\,\underbrace{\mathring{a}^{*}e_{j} - \mathring{e}^{*}_{j}a} + 2\varkappa\,X^{-}_{\underbrace{\delta^{j}_{k}e_{j}\mathring{e}^{*}_{j}a}} = 2\,\delta^{j}_{k}\,\underbrace{\mathring{a}^{*}e_{j} - \mathring{e}^{*}_{j}a} + \varkappa\,\delta^{j}_{k}\,X^{-}_{a} = \varkappa\,\delta^{j}_{k}\,\overbrace{X^{-}_{a} + 2\varkappa\,\underbrace{\mathring{a}^{*}e_{j} - \mathring{e}^{*}_{j}a}}$$

$$\mathfrak{E}_{\varpi}\,|\,{}_{\in}\mathbb{I} \;=\; \mathfrak{E}^{O}_{\varpi\,1}\,|\,{}_{\in}\mathbb{I} \times \mathfrak{E}^{O}_{\varpi\,-}\,|\,{}_{\in}\mathbb{I} \times \sum_{\P \neq 0} \mathfrak{E}^{\P}_{\varpi}\,|\,{}_{\in}\mathbb{I}$$

$$= \;\mathfrak{E}^{O}_{\varpi}\,|\,{}_{\in}\mathbb{I} \times \sum_{1 \leqslant i < j \leqslant r} \mathfrak{E}^{\varkappa}_{\varpi\, j\,-\,i}\,|\,{}_{\in}\mathbb{I} \times \sum_{0 \leqslant i \leqslant j \leqslant r} \mathfrak{E}^{\varkappa}_{\varpi\, j\,+\,i}\,|\,{}_{\in}\mathbb{I}$$

$$\underset{\omega}{\Theta}^{O}_{\_}\,|_{\in}\mathbb{L} =< 2z\,e^{*}_{k}\,e_{\blacktriangle}\,l_{z}\,{}_{\leqslant}|k \leqslant r > \xrightarrow{\dashv} \mathbb{R}$$

$$\underset{\omega}{\Theta}^{O}_{1}|_{\in}\mathbb{L} = \frac{\delta \in \Theta\,(X)}{e_{k}\delta = 0}$$

$$\underset{\omega}{\Theta}^{1}_{j\,-\,i}|_{\in}\mathbb{L} = \frac{\left(z\mathring{a}e_{j}\right)\partial_{z} = \left(z\overset{*}{e}_{i}a\right)\partial_{z}}{a = \overset{*}{a} \in {}^{i}\mathbb{L}_{j}} : \quad 0 < i < j$$

$$\underset{\omega}{\Theta}^{-}_{j\,-\,i}|_{\in}\mathbb{L} = \frac{\left(z\mathring{a}e_{i}\right)\partial_{z} = \left(z\overset{*}{e}_{j}a\right)\partial_{z}}{a = \overset{*}{a} \in {}^{i}\mathbb{L}_{j}} : \quad 0 < i < j$$

$$\underset{\omega}{\Theta}^{1}_{j\,+\,i}|_{\in}\mathbb{L} = \frac{a\partial_{z}}{a = -\overset{*}{a} \in {}^{i}\mathbb{L}_{j}} : \quad i \leqslant j$$

$$\underset{\omega}{\Theta}^{-}_{j\,+\,i}|_{\in}\mathbb{L} = \frac{z\overset{*}{a}z\partial_{z}}{a = -\overset{*}{a} \in {}^{i}\mathbb{L}_{j}} : \quad i \leqslant j$$

$$\underset{\omega}{\Theta}^{1}_{j}|_{\in}\mathbb{L} = \frac{\left(b + 2z\overset{*}{b}e\right)\partial_{z}}{b \in {}^{0}\mathbb{L}_{j}} : \quad 0 = i < j$$

$$\underset{\omega}{\Theta}^{-}_{j}|_{\in}\mathbb{L} = \frac{\left(z\overset{*}{b}z + 2z\overset{*}{e}b\right)\partial_{z}}{b \in {}^{0}\mathbb{L}_{j}} : \quad 0 = i < j$$

$$\underset{\omega}{\Theta}^{\dashv}|_{\in}\mathbb{L} = \frac{\mathfrak{b} \in \underset{\omega}{\Theta}|_{\in}\mathbb{L}}{2\mathfrak{b} \times \left(\overset{*}{e}_{k}e_{k}\right) = \overbrace{\left(2\overset{*}{e}_{k}e_{k}\right)}\dashv\mathfrak{b}}$$

$$\underset{\omega}{\Theta}^{\varkappa}_{j\,-\,i}|_{\in}\mathbb{L} = \underset{\omega}{\Theta}^{\varkappa\,\underbrace{\delta^{j}\,-\,\delta^{i}}}|_{\in}\mathbb{L}$$

$$2\left(\overset{*}{e}_{k}e_{k}\right)\dashv = \varkappa\underbrace{\delta^{j}_{k} - \delta^{i}_{k}}$$

$$a \in {}^{m}\mathbb{L}_{n}$$

$$1 \leqslant m \neq n \leqslant r \Longrightarrow \left(\overset{*}{a}e_{n}\right) \times \left(2\overset{*}{e}_{k}e_{k}\right) = 2\,\overset{*}{a}\,\left(e_{n}\overset{*}{e}_{k}e_{k}\right) - 2\left(e_{k}\overset{*}{\overset{*}{e}}_{k}a\right)e_{n} = 2\,\delta^{n}_{k}\,\overset{*}{a}\,e_{n} - \left(\delta^{m}_{k} + \delta^{n}_{k}\right)\overset{*}{a}\,e_{n} = \left(\delta^{n}_{k} - \delta^{m}_{k}\right)\overset{*}{a}\,e_{n}$$

$$\underset{\omega}{\Theta}^{\varkappa}_{j\,+\,i}|_{\in}\mathbb{L} = \underset{\omega}{\Theta}^{\varkappa\,\underbrace{\delta^{j}\,+\,\delta^{i}}}|_{\in}\mathbb{L}$$

$$2\left(\overset{*}{e}_{k}e_{k}\right)\dashv = \varkappa\underbrace{\delta^{j}_{k} + \delta^{i}_{k}}$$

$$a \ast \left(2z\mathring{e}_k e_k\right) = 2a\,\mathring{e}_k\, e_k \;=\; \underbrace{\delta^j_k + \delta^i_k}\, a$$

$$\left(2z\mathring{e}_k e_k\right) \ast \left(z\mathring{a}z\right) = 4\left(z\mathring{e}_k e_k\right)\,\mathring{a}\,z - 2\left(z\mathring{a}z\right)\,\mathring{e}_k\, e_k \;= 2z\left(e_k\mathring{\mathring{e}}_k a\right) z = \underbrace{\delta^j_k + \delta^i_k} z < \mathring{a}\, z$$

$$\mathfrak{S}^{\varkappa}_{\omega\, j} \,|\, {}_{\in}\mathbb{L} \;=\; \mathfrak{S}^{\varkappa\delta^j}_{\omega} \,|\, {}_{\in}\mathbb{L}$$

$$2\left(\mathring{e}_k e_k\right) \P = \varkappa\,\delta^j_k$$

$$\left(b + 2\mathring{b}e\right) \underset{\mathring{e}_k e_k}{\ast} = 2b \ast \left(\mathring{e}_k e_k\right) + 4\left(\mathring{b}e\right) \ast \left(\mathring{e}_k e_k\right) = 2b\,\mathring{e}_k\, e_k + 4\left(\mathring{b}\left(e\mathring{e}_k e_k\right) - \left(e_k\mathring{\mathring{e}}_k b\right) e\right)$$

$$= \;\delta^j_k b + 4\left(\mathring{b}\delta^j_k e_j - \delta^j_k \mathring{b}e/2\right) = \;\delta^j_k\;\left(b + 2\mathring{b}e\right)$$

$$2\left(z\mathring{e}_k e_k\right) \ast \left(z\mathring{b}z + 2z\mathring{e}b\right) = 4\left(z\mathring{e}_k e_k\right)\,\mathring{b}\,z - 2\left(z\mathring{b}z\right)\,\mathring{e}_k\, e_k + 4\left(\mathring{e}_k e_k\right) \ast \left(\mathring{e}b\right) =$$

$$2z\left(e_k\mathring{\mathring{e}}_k b\right) z + 4\left(\mathring{e}_k\left(e_k\mathring{e}b\right) - \left(e\mathring{\mathring{b}}e_k\right) e_k\right) = \;\delta^j_k z\,\mathring{b}\,z + 4\,\delta^j_k\,\mathring{e}_k\, b/2 = \;\delta^j_k\;\left(z\mathring{b}z + 2z\mathring{e}b\right)$$

$$\left(2\mathring{e}_k e_k\right) \underset{\mathcal{G}}{\ast} \left(2\mathring{e}_\ell e_\ell\right) = 4p\,\delta_{k:l}$$

$$\mathrm{tr}\;\;\ast_{\mathcal{G}}\;\left(2\mathring{e}_k e_k\right)\;\ast_{\mathcal{G}}\;\left(2\mathring{e}_\ell e_\ell\right) = \sum_{i<j}\left(\delta^j_k - \delta^i_k\right)\;\left(\delta^j_\ell \underset{a}{-} \delta^i_\ell\right) + \sum_{i<j}\left(\delta^j_k + \delta^i_k\right)\;\left(\delta^j_\ell \underset{a}{+} \delta^i_\ell\right)$$

$$+ \sum_j 2\,\delta^j_k 2\,\delta^j_\ell 2 + \sum_j\;\delta^j_k\;\delta^j_\ell 4b = 4a\sum_{i<j}\left(\delta^j_k\delta^j_\ell + \delta^i_k\delta^i_\ell\right) + 4\sum_j\;\delta^j_k\;\delta^j_\ell\;(2+b) =$$

$$\begin{cases} 4a\sum\limits_{i<j}\left(\delta^j_k + \delta^i_k\right) + 4\sum\limits_j \delta^j_k\,(2+b) = 4a\left(\sum\limits_{k<j} 1 + \sum\limits_{i<k} 1 + 4\,(2+b)\right) = 4\left(a\,(r-1) + 2 + b\right) = 4p & k = \ell \\ 0 & k \neq \ell \end{cases}$$

$$M^\sharp_{e_1}$$

$$\text{prim pos roots}\;\begin{cases} \dfrac{M^\sharp_{e_2} - M^\sharp_{e_1}}{2} \cdots \dfrac{M^\sharp_{e_r} M^\sharp_{e_{r-1}}}{2} & b = 0 \\ \dfrac{M^\sharp_{e_1}}{2} : \dfrac{M^\sharp_{e_2} - M^\sharp_{e_1}}{2} \cdots \dfrac{M^\sharp_{e_r} M^\sharp_{e_{r-1}}}{2} & b > 0 \end{cases}$$