

$$q \frac{u \mid v_1}{v_2 \mid w} = \frac{a \mid b}{c \mid d} \frac{u \mid v_1}{v_2 \mid w} \frac{\alpha \mid \beta}{\gamma \mid \delta}$$

$$qU = U \Leftrightarrow qz = \frac{a \mid b}{0 \mid d} z \frac{\alpha \mid 0}{\gamma \mid \delta}$$

$$\frac{\dot{u} \mid 0}{0 \mid 0} = q \frac{u \mid 0}{0 \mid 0} = \frac{a \mid b}{c \mid d} \frac{u \mid 0}{0 \mid 0} \frac{\alpha \mid \beta}{\gamma \mid \delta} = \frac{au \mid 0}{cu \mid 0} \frac{\alpha \mid \beta}{\gamma \mid \delta} = \frac{au\alpha \mid au\beta}{cu\alpha \mid cu\beta} \Rightarrow \begin{cases} a \text{ inv } \alpha \\ c = 0 = \beta \end{cases}$$

$$\overset{*}{q}z = \frac{\overset{*}{a} \mid 0}{\overset{*}{b} \mid \overset{*}{d}} z \frac{\overset{*}{\alpha} \mid \overset{*}{\gamma}}{0 \mid \overset{*}{\delta}}$$

$$P_1 \overset{*}{q} = P_1 \overset{*}{q} P_1$$

$$\frac{\overset{*}{a} \mid 0}{\overset{*}{b} \mid \overset{*}{d}} \frac{u \mid v_1}{v_2 \mid w} \frac{\overset{*}{\alpha} \mid \overset{*}{\gamma}}{0 \mid \overset{*}{\delta}} = \frac{\overset{*}{a}u \mid x}{x \mid x} \frac{\overset{*}{\alpha} \mid \overset{*}{\gamma}}{0 \mid \overset{*}{\delta}} = \frac{\overset{*}{a}u\overset{*}{\alpha} \mid x}{x \mid x}$$

$$\Delta_1 (P_1 \overset{*}{q}u) = \overline{\Delta_1 (qe)} \Delta_1 (u)$$

$$qu = au\alpha \Rightarrow \Delta_1 (qu) = \Delta (au\alpha) = \Delta_1 (a\alpha) \Delta_1 (u)$$

$$P_1 \overset{*}{q}u = \overset{*}{a}u\overset{*}{\alpha}$$

$$\Delta_1 (P_1 \overset{*}{q}u) = \Delta_1 (\overset{*}{a}u\overset{*}{\alpha}) = \Delta_1 (\overset{*}{a}\overset{*}{\alpha}) \Delta_1 (u)$$

$$\Delta_1 (\overset{*}{a}\overset{*}{\alpha}) = \Delta_1 (\overset{*}{\alpha}\overset{*}{a}) = \Delta_1 \left(\overline{\overset{*}{a\alpha}} \right) = \overline{\Delta_1 (a\alpha)} = \overline{\Delta_1} (qe)$$

$$\Delta_1 (P_1 \overset{*}{q}z) = \Delta_1 (P_1 \overset{*}{q}P_1 z) = \overline{\Delta_1} (qe) \Delta_1 (P_1 z)$$

$$\tilde{\phi}(h) = {}^{he}K_b^m = {}^eK_{\overset{*}{hb}}^m = {}^eK_{P_1 \overset{*}{hb}}^m = \overline{\Delta_1}^m (P_1 \overset{*}{hb})$$

$$\tilde{\phi}(hq) = \Delta_1^m(qe) \tilde{\phi}(h)$$

$$\text{LHS} = \bar{\Delta}_1^m \left(P_1 \widehat{hqb}^* \right) = \bar{\Delta}_1^m \left(P_1 \dot{q}^* \dot{h}^* b \right) = \Delta_1^m(qe) \bar{\Delta}_1^m \left(P_1 \dot{h}^* b \right) = \text{RHS}$$