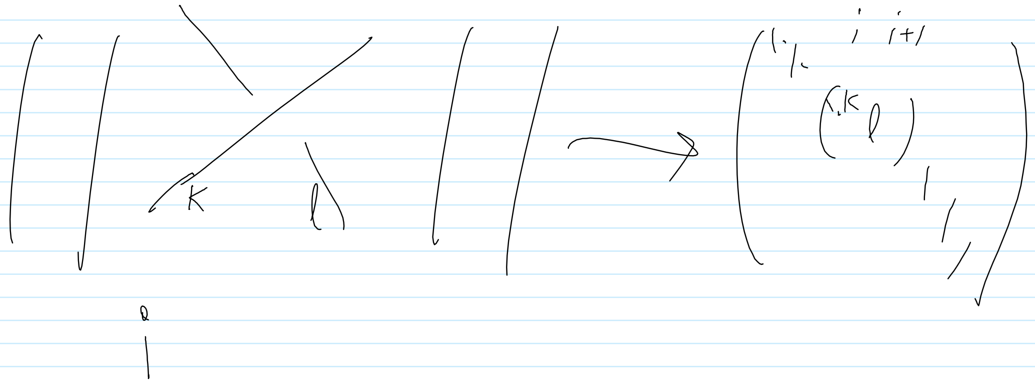
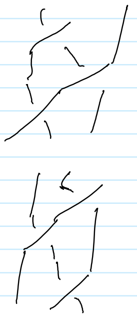
The most general Gassner invariant

July-14-14 6:14 AM





$$U_1(t_1,t_2)\,U_2(t_1,t_3)\,U_1(t_2,t_3)$$
$$=$$
$$U_2(t_2,t_3)\,U_1(t_1,t_3)\,U_2(t_1,t_2) \quad ?$$

where

$$U_1(u,v) = \begin{pmatrix} \alpha(u,v) & \beta(u,v) & 0 \\ \gamma(u,v) & \delta(u,v) & 0 \\ 0 & 0 & 1 \end{pmatrix} \quad \text{and} \quad U_2 = \begin{pmatrix} 1 & 0 & 0 \\ 0 & \alpha & \beta \\ 0 & \gamma & \delta \end{pmatrix}$$

$$\begin{array}{ccc} & \begin{pmatrix} 1 & 0 & 0 \\ 0 & \alpha_{13} & \beta_{13} \\ 0 & \gamma_{13} & \delta_{13} \end{pmatrix} & \begin{pmatrix} \alpha_{23} & \beta_{23} & 0 \\ \gamma_{23} & \delta_{23} & 0 \\ 0 & 0 & 1 \end{pmatrix} \\ \begin{pmatrix} \alpha_{12} & \beta_{12} & 0 \\ \gamma_{12} & \delta_{12} & 0 \\ 0 & 0 & 1 \end{pmatrix} & \begin{pmatrix} \alpha_{12} & \beta_{12}\alpha_{13} & \beta_{12}\beta_{13} \\ \gamma_{12} & \delta_{12}\alpha_{13} & \delta_{12}\beta_{13} \\ 0 & \gamma_{13} & \delta_{13} \end{pmatrix} & \begin{pmatrix} \alpha_{12}\alpha_{23}+\beta_{12}\alpha_{13}\gamma_{23} & \alpha_{12}\beta_{23}+\beta_{12}\alpha_{13}\delta_{23} & \beta_{12}\beta_{13} \\ \gamma_{12}\alpha_{23}+\delta_{12}\alpha_{13}\gamma_{23} & \gamma_{12}\beta_{23}+\delta_{12}\alpha_{13}\delta_{23} & \delta_{12}\beta_{13} \\ \gamma_{13}\gamma_{23} & \gamma_{13}\delta_{23} & \delta_{13} \end{pmatrix} \end{array}$$