$$\delta(\gamma(x_3),\gamma(\gamma(\alpha)),\sigma(\gamma(x_2),x_1))\\ \delta(\gamma(x_3),\gamma(x_3),\sigma(\gamma(\alpha),\gamma(\gamma(x_2))))$$

$$\left\{ \begin{pmatrix} \delta(\gamma(x_3),\gamma(\gamma(\alpha)),\sigma(\gamma(x_2),x_1)) \\ \delta(\gamma(x_3),\gamma(x_3),\sigma(\gamma(\alpha),\gamma(\gamma(x_2)))) \end{pmatrix} \right\}$$

$$\begin{cases} \left(\begin{matrix} \delta(\gamma(x_3), \gamma(\gamma(\alpha)), \sigma(\gamma(x_2), x_1)) \\ \delta(\gamma(x_3), \gamma(x_3), \sigma(\gamma(\alpha), \gamma(\gamma(x_2)))) \end{matrix} \right) \\ \Rightarrow \left\{ \left(\begin{matrix} \gamma(x_3) \\ \gamma(x_3) \end{matrix} \right), \left(\begin{matrix} \gamma(\gamma(\alpha)) \\ \gamma(x_3) \end{matrix} \right), \left(\begin{matrix} \sigma(\gamma(x_2), x_1) \\ \sigma(\gamma(\alpha), \gamma(\gamma(x_2))) \end{matrix} \right) \right\} \end{cases}$$

$$\begin{cases} \left(\begin{array}{c} \delta(\gamma(x_3),\gamma(\gamma(\alpha)),\sigma(\gamma(x_2),x_1)) \\ \delta(\gamma(x_3),\gamma(x_3),\sigma(\gamma(\alpha),\gamma(\gamma(x_2)))) \end{array} \right) \\ \overset{\text{Dekomp.}}{\Rightarrow} \left\{ \left(\begin{array}{c} \gamma(x_3) \\ \gamma(x_3) \end{array} \right), \left(\begin{array}{c} \gamma(\gamma(\alpha)) \\ \gamma(x_3) \end{array} \right), \left(\begin{array}{c} \sigma(\gamma(x_2),x_1) \\ \sigma(\gamma(\alpha),\gamma(\gamma(x_2))) \end{array} \right) \right\} \\ \overset{\text{Dekomp.}}{\Rightarrow} \left\{ \left(\begin{array}{c} x_3 \\ x_3 \end{array} \right), \left(\begin{array}{c} \gamma(\alpha) \\ x_3 \end{array} \right), \left(\begin{array}{c} \gamma(x_2) \\ \gamma(\alpha) \end{array} \right), \left(\begin{array}{c} x_1 \\ \gamma(\gamma(x_2)) \end{array} \right) \right\} \end{cases}$$

$$\begin{cases} \left(\begin{array}{c} \delta(\gamma(x_3),\gamma(\gamma(\alpha)),\sigma(\gamma(x_2),x_1)) \\ \delta(\gamma(x_3),\gamma(x_3),\sigma(\gamma(\alpha),\gamma(\gamma(x_2)))) \end{array} \right) \\ \overset{\text{Dekomp.}}{\Rightarrow} \left\{ \left(\begin{array}{c} \gamma(x_3) \\ \gamma(x_3) \end{array} \right), \left(\begin{array}{c} \gamma(\gamma(\alpha)) \\ \gamma(x_3) \end{array} \right), \left(\begin{array}{c} \sigma(\gamma(x_2),x_1) \\ \sigma(\gamma(\alpha),\gamma(\gamma(x_2))) \end{array} \right) \right\} \\ \overset{\text{Dekomp.}}{\Rightarrow} \left\{ \left(\begin{array}{c} x_3 \\ x_3 \end{array} \right), \left(\begin{array}{c} \gamma(\alpha) \\ x_3 \end{array} \right), \left(\begin{array}{c} \gamma(x_2) \\ \gamma(\alpha) \end{array} \right), \left(\begin{array}{c} x_1 \\ \gamma(\gamma(x_2)) \end{array} \right) \right\} \\ \overset{\text{Elim.}}{\Rightarrow} \left\{ \left(\begin{array}{c} \gamma(\alpha) \\ x_3 \end{array} \right), \left(\begin{array}{c} \gamma(x_2) \\ \gamma(\alpha) \end{array} \right), \left(\begin{array}{c} x_1 \\ \gamma(\gamma(x_2)) \end{array} \right) \right\} \end{cases}$$

$$\begin{cases} \left(\begin{array}{c} \delta(\gamma(x_3),\gamma(\gamma(\alpha)),\sigma(\gamma(x_2),x_1)) \\ \delta(\gamma(x_3),\gamma(x_3),\sigma(\gamma(\alpha),\gamma(\gamma(x_2)))) \end{array} \right) \\ \stackrel{\text{Dekomp.}}{\Rightarrow} \left\{ \begin{pmatrix} \gamma(x_3) \\ \gamma(x_3) \end{pmatrix}, \begin{pmatrix} \gamma(\gamma(\alpha)) \\ \gamma(x_3) \end{pmatrix}, \begin{pmatrix} \sigma(\gamma(x_2),x_1) \\ \sigma(\gamma(\alpha),\gamma(\gamma(x_2))) \end{pmatrix} \right\} \\ \stackrel{\text{Dekomp.}}{\Rightarrow} \left\{ \begin{pmatrix} x_3 \\ x_3 \end{pmatrix}, \begin{pmatrix} \gamma(\alpha) \\ x_3 \end{pmatrix}, \begin{pmatrix} \gamma(\alpha) \\ \gamma(\alpha) \end{pmatrix}, \begin{pmatrix} \gamma(x_2) \\ \gamma(\alpha) \end{pmatrix}, \begin{pmatrix} x_1 \\ \gamma(\gamma(x_2)) \end{pmatrix} \right\} \\ \stackrel{\text{Elim.}}{\Rightarrow} \left\{ \begin{pmatrix} \gamma(\alpha) \\ x_3 \end{pmatrix}, \begin{pmatrix} \gamma(x_2) \\ \gamma(\alpha) \end{pmatrix}, \begin{pmatrix} x_1 \\ \gamma(\gamma(x_2)) \end{pmatrix} \right\} \\ \stackrel{\text{Vert.}}{\Rightarrow} \left\{ \begin{pmatrix} x_3 \\ \gamma(\alpha) \end{pmatrix}, \begin{pmatrix} \gamma(x_2) \\ \gamma(\alpha) \end{pmatrix}, \begin{pmatrix} x_1 \\ \gamma(\gamma(x_2)) \end{pmatrix} \right\} \end{cases}$$

$$\begin{cases} \left(\begin{array}{c} \delta(\gamma(x_3),\gamma(\gamma(\alpha)),\sigma(\gamma(x_2),x_1)) \\ \delta(\gamma(x_3),\gamma(x_3),\sigma(\gamma(\alpha),\gamma(\gamma(x_2)))) \end{array} \right) \\ \stackrel{\text{Dekomp.}}{\Rightarrow} \left\{ \begin{pmatrix} \gamma(x_3) \\ \gamma(x_3) \end{pmatrix}, \begin{pmatrix} \gamma(\gamma(\alpha)) \\ \gamma(x_3) \end{pmatrix}, \begin{pmatrix} \sigma(\gamma(x_2),x_1) \\ \sigma(\gamma(\alpha),\gamma(\gamma(x_2))) \end{pmatrix} \right\} \\ \stackrel{\text{Dekomp.}}{\Rightarrow} \left\{ \begin{pmatrix} x_3 \\ x_3 \end{pmatrix}, \begin{pmatrix} \gamma(\alpha) \\ x_3 \end{pmatrix}, \begin{pmatrix} \gamma(x_2) \\ \gamma(\alpha) \end{pmatrix}, \begin{pmatrix} x_1 \\ \gamma(\gamma(x_2)) \end{pmatrix} \right\} \\ \stackrel{\text{Elim.}}{\Rightarrow} \left\{ \begin{pmatrix} \gamma(\alpha) \\ x_3 \end{pmatrix}, \begin{pmatrix} \gamma(x_2) \\ \gamma(\alpha) \end{pmatrix}, \begin{pmatrix} x_1 \\ \gamma(\gamma(x_2)) \end{pmatrix} \right\} \\ \stackrel{\text{Vert.}}{\Rightarrow} \left\{ \begin{pmatrix} x_3 \\ \gamma(\alpha) \end{pmatrix}, \begin{pmatrix} \gamma(x_2) \\ \gamma(\alpha) \end{pmatrix}, \begin{pmatrix} x_1 \\ \gamma(\gamma(x_2)) \end{pmatrix} \right\} \\ \stackrel{\text{Dekomp.}}{\Rightarrow} \left\{ \begin{pmatrix} x_3 \\ \gamma(\alpha) \end{pmatrix}, \begin{pmatrix} x_2 \\ \alpha \end{pmatrix}, \begin{pmatrix} x_1 \\ \gamma(\gamma(x_2)) \end{pmatrix} \right\} \end{cases}$$

Aufgabe 3 (cont.)

$$\left\{ \begin{pmatrix} x_3 \\ \gamma(\alpha)) \end{pmatrix}, \begin{pmatrix} x_2 \\ \alpha \end{pmatrix}, \begin{pmatrix} x_1 \\ \gamma(\gamma(x_2)) \end{pmatrix} \right\}$$

Aufgabe 3 (cont.)

$$\begin{cases} \begin{pmatrix} x_3 \\ \gamma(\alpha) \end{pmatrix}, \begin{pmatrix} x_2 \\ \alpha \end{pmatrix}, \begin{pmatrix} x_1 \\ \gamma(\gamma(x_2)) \end{pmatrix} \end{cases}$$
 Subst.
$$\begin{cases} \begin{pmatrix} x_3 \\ \gamma(\alpha) \end{pmatrix}, \begin{pmatrix} x_2 \\ \alpha \end{pmatrix}, \begin{pmatrix} x_1 \\ \gamma(\gamma(\alpha)) \end{pmatrix} \end{cases}$$

Aufgabe 3 (cont.)

$$\begin{split} \left\{ \begin{pmatrix} x_3 \\ \gamma(\alpha) \end{pmatrix}, \begin{pmatrix} x_2 \\ \alpha \end{pmatrix}, \begin{pmatrix} x_1 \\ \gamma(\gamma(x_2)) \end{pmatrix} \right\} \\ & \stackrel{\text{Subst.}}{\Rightarrow} \left\{ \begin{pmatrix} x_3 \\ \gamma(\alpha) \end{pmatrix}, \begin{pmatrix} x_2 \\ \alpha \end{pmatrix}, \begin{pmatrix} x_1 \\ \gamma(\gamma(\alpha)) \end{pmatrix} \right\} \\ x_1 \mapsto \gamma(\gamma(\alpha)) \qquad x_2 \mapsto \alpha \qquad x_3 \mapsto \gamma(\alpha) \end{split}$$