Aufgabe 3

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

Aufgabe 3

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

Aufgabe 3

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

$$\stackrel{\text{Dekomp.}}{\Rightarrow} \left\{ \begin{pmatrix} \gamma(x_3) \\ \gamma(x_3) \end{pmatrix}, \begin{pmatrix} \gamma(\gamma(\alpha)) \\ \gamma(x_3) \end{pmatrix}, \begin{pmatrix} \sigma(\gamma(x_2), x_1) \\ \sigma(\gamma(\alpha), \gamma(\gamma(x_2))) \end{pmatrix} \right\}$$

Aufgabe 3

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

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

$$\overset{\text{Dekomp.}}{\Rightarrow} \left\{ \begin{pmatrix} x_3 \\ x_3 \end{pmatrix}, \begin{pmatrix} \gamma(\alpha)) \\ x_3 \end{pmatrix}, \begin{pmatrix} \gamma(x_2) \\ \gamma(\alpha) \end{pmatrix}, \begin{pmatrix} x_1 \\ \gamma(\gamma(x_2)) \end{pmatrix} \right\}$$

Aufgabe 3

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

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

$$\overset{\text{Dekomp.}}{\Rightarrow} \left\{ \begin{pmatrix} x_3 \\ x_3 \end{pmatrix}, \begin{pmatrix} \gamma(\alpha)) \\ x_3 \end{pmatrix}, \begin{pmatrix} \gamma(x_2) \\ \gamma(\alpha) \end{pmatrix}, \begin{pmatrix} x_1 \\ \gamma(\gamma(x_2)) \end{pmatrix} \right\}$$

$$\overset{\text{Elim.}}{\Rightarrow} \left\{ \begin{pmatrix} \gamma(\alpha)) \\ x_3 \end{pmatrix}, \begin{pmatrix} \gamma(x_2) \\ \gamma(\alpha) \end{pmatrix}, \begin{pmatrix} x_1 \\ \gamma(\gamma(x_2)) \end{pmatrix} \right\}$$

Aufgabe 3

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

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

$$\overset{\text{Dekomp.}}{\Rightarrow} \left\{ \begin{pmatrix} x_3 \\ x_3 \end{pmatrix}, \begin{pmatrix} \gamma(\alpha)) \\ x_3 \end{pmatrix}, \begin{pmatrix} \gamma(x_2) \\ \gamma(\alpha) \end{pmatrix}, \begin{pmatrix} x_1 \\ \gamma(\gamma(x_2)) \end{pmatrix} \right\}$$

$$\overset{\text{Elim.}}{\Rightarrow} \left\{ \begin{pmatrix} \gamma(\alpha)) \\ x_3 \end{pmatrix}, \begin{pmatrix} \gamma(x_2) \\ \gamma(\alpha) \end{pmatrix}, \begin{pmatrix} x_1 \\ \gamma(\gamma(x_2)) \end{pmatrix} \right\}$$

$$\overset{\text{Vert.}}{\Rightarrow} \left\{ \begin{pmatrix} x_3 \\ \gamma(\alpha)) \end{pmatrix}, \begin{pmatrix} \gamma(x_2) \\ \gamma(\alpha) \end{pmatrix}, \begin{pmatrix} x_1 \\ \gamma(\gamma(x_2)) \end{pmatrix} \right\}$$

Aufgabe 3

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

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

$$\overset{\text{Dekomp.}}{\Rightarrow} \left\{ \begin{pmatrix} x_3 \\ x_3 \end{pmatrix}, \begin{pmatrix} \gamma(\alpha)) \\ x_3 \end{pmatrix}, \begin{pmatrix} \gamma(x_2) \\ \gamma(\alpha) \end{pmatrix}, \begin{pmatrix} x_1 \\ \gamma(\gamma(x_2)) \end{pmatrix} \right\}$$

$$\overset{\text{Elim.}}{\Rightarrow} \left\{ \begin{pmatrix} \gamma(\alpha)) \\ x_3 \end{pmatrix}, \begin{pmatrix} \gamma(x_2) \\ \gamma(\alpha) \end{pmatrix}, \begin{pmatrix} x_1 \\ \gamma(\gamma(x_2)) \end{pmatrix} \right\}$$

$$\overset{\text{Vert.}}{\Rightarrow} \left\{ \begin{pmatrix} x_3 \\ \gamma(\alpha)) \end{pmatrix}, \begin{pmatrix} \gamma(x_2) \\ \gamma(\alpha) \end{pmatrix}, \begin{pmatrix} x_1 \\ \gamma(\gamma(x_2)) \end{pmatrix} \right\}$$

$$\overset{\text{Dekomp.}}{\Rightarrow} \left\{ \begin{pmatrix} x_3 \\ \gamma(\alpha)) \end{pmatrix}, \begin{pmatrix} x_2 \\ \alpha \end{pmatrix}, \begin{pmatrix} x_1 \\ \gamma(\gamma(x_2)) \end{pmatrix} \right\}$$

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

Aufgabe 3 (cont.)

$$\left\{ \binom{x_3}{\gamma(\alpha))}, \binom{x_2}{\alpha}, \binom{x_1}{\gamma(\gamma(x_2))} \right\}$$

$$\stackrel{\text{Subst.}}{\Rightarrow} \left\{ \binom{x_3}{\gamma(\alpha))}, \binom{x_2}{\alpha}, \binom{x_1}{\gamma(\gamma(\alpha))} \right\}$$

Aufgabe 3 (cont.)

$$\left\{ \binom{x_3}{\gamma(\alpha))}, \binom{x_2}{\alpha}, \binom{x_1}{\gamma(\gamma(x_2))} \right\}$$

$$\stackrel{\text{Subst.}}{\Rightarrow} \left\{ \binom{x_3}{\gamma(\alpha))}, \binom{x_2}{\alpha}, \binom{x_1}{\gamma(\gamma(\alpha))} \right\}$$

$$x_1 \mapsto \gamma(\gamma(\alpha)) \qquad x_2 \mapsto \alpha \qquad x_3 \mapsto \gamma(\alpha)$$