

ME = MatrixExp;

Simplify[

$$\text{ME}[\tau_1 \rho t] \cdot \text{ME}[\eta_1 \rho y] \cdot \text{ME}[\alpha_1 \rho a] \cdot \text{ME}[\xi_1 \rho x] \cdot \text{ME}[\tau_2 \rho t] \cdot$$

$$\text{ME}[\eta_2 \rho y] \cdot \text{ME}[\alpha_2 \rho a] \cdot \text{ME}[\xi_2 \rho x] ==$$

$$\text{ME}[\tau_0 \rho t] \cdot \text{ME}[\eta_0 \rho y] \cdot \text{ME}[\alpha_0 \rho a] \cdot \text{ME}[\xi_0 \rho x] / .$$

$$\left\{ \tau_0 \rightarrow -\frac{\text{Log}[1 - \epsilon \eta_2 \xi_1]}{\epsilon} + \tau_1 + \tau_2, \eta_0 \rightarrow \eta_1 + \frac{e^{-\alpha_1} \eta_2}{1 - \epsilon \eta_2 \xi_1}, \right.$$

$$\left. \alpha_0 \rightarrow 2 \text{Log}[1 - \epsilon \eta_2 \xi_1] + \alpha_1 + \alpha_2, \xi_0 \rightarrow \frac{e^{-\alpha_2} \xi_1}{1 - \epsilon \eta_2 \xi_1} + \xi_2 \right\}]$$

True