

$$\begin{aligned} > la1 := -\frac{1 \cdot ((k01 + k21 + k12) - ((k01 + k21 + k12)^2 - 4 \cdot k01 \cdot k12)^{0.5})}{2} \\ la1 := -\frac{1}{2} k01 - \frac{1}{2} k21 - \frac{1}{2} k12 + \frac{1}{2} ((k01 + k21 + k12)^2 - 4 k01 k12)^{0.5} \end{aligned} \quad (1)$$

$$\begin{aligned} > la2 := -\frac{1 \cdot ((k01 + k21 + k12) + ((k01 + k21 + k12)^2 - 4 \cdot k01 \cdot k12)^{0.5})}{2} \\ la2 := -\frac{1}{2} k01 - \frac{1}{2} k21 - \frac{1}{2} k12 - \frac{1}{2} ((k01 + k21 + k12)^2 - 4 k01 k12)^{0.5} \end{aligned} \quad (2)$$

$$\begin{aligned} > a := \frac{(k01 + k21 + la1)}{k12} \\ a := \frac{\frac{1}{2} k01 + \frac{1}{2} k21 - \frac{1}{2} k12 + \frac{1}{2} ((k01 + k21 + k12)^2 - 4 k01 k12)^{0.5}}{k12} \end{aligned} \quad (3)$$

$$\begin{aligned} > b := \frac{k21}{(k12 + la2)} \\ b := \frac{k21}{\frac{1}{2} k12 - \frac{1}{2} k01 - \frac{1}{2} k21 - \frac{1}{2} ((k01 + k21 + k12)^2 - 4 k01 k12)^{0.5}} \end{aligned} \quad (4)$$

$$\begin{aligned} > x1s := \frac{\left(\frac{Dose}{\tau}\right)}{k01} \\ x1s := \frac{Dose}{\tau k01} \end{aligned} \quad (5)$$

$$\begin{aligned} > x2s := x1s \cdot \left(\frac{k21}{k12}\right) \\ x2s := \frac{Dose k21}{\tau k01 k12} \end{aligned} \quad (6)$$

$$\begin{aligned} > y1s := \frac{\rho}{k01} \\ y1s := \frac{\rho}{k01} \end{aligned} \quad (7)$$

$$\begin{aligned} > y2s := y1s \cdot \left(\frac{k21}{k12}\right) \\ y2s := \frac{\rho k21}{k01 k12} \end{aligned} \quad (8)$$

$$\begin{aligned} > M1 := \frac{((x10 - x1s) \cdot b - (x20 - x2s))}{(b - a)} \\ M1 := \frac{\left(x10 - \frac{Dose}{\tau k01}\right) k21}{\frac{1}{2} k12 - \frac{1}{2} k01 - \frac{1}{2} k21 - \frac{1}{2} ((k01 + k21 + k12)^2 - 4 k01 k12)^{0.5}} - x20 \end{aligned} \quad (9)$$

$$\begin{aligned}
& \left. + \frac{Dose k21}{\tau k01 k12} \right) \Bigg/ \\
& \left. \left(\frac{k21}{\frac{1}{2} k12 - \frac{1}{2} k01 - \frac{1}{2} k21 - \frac{1}{2} \sqrt{(k01 + k21 + k12)^2 - 4 k01 k12}} \right)^{0.5} \right. \\
& \left. - \frac{\frac{1}{2} k01 + \frac{1}{2} k21 - \frac{1}{2} k12 + \frac{1}{2} \sqrt{(k01 + k21 + k12)^2 - 4 k01 k12}}{k12} \right) \Bigg/ \\
\Rightarrow M2 := & \frac{((x20 - x2s) - (x10 - x1s) \cdot a)}{(b - a)} \\
M2 := & \left(x20 - \frac{Dose k21}{\tau k01 k12} \right. \\
& - \frac{1}{k12} \left(\left(x10 - \frac{Dose}{\tau k01} \right) \left(\frac{1}{2} k01 + \frac{1}{2} k21 - \frac{1}{2} k12 + \frac{1}{2} \sqrt{(k01 + k21 + k12)^2 - 4 k01 k12} \right)^{0.5} \right) \Bigg) \Bigg/ \\
& \left. \left(\frac{k21}{\frac{1}{2} k12 - \frac{1}{2} k01 - \frac{1}{2} k21 - \frac{1}{2} \sqrt{(k01 + k21 + k12)^2 - 4 k01 k12}} \right)^{0.5} \right. \\
& \left. - \frac{\frac{1}{2} k01 + \frac{1}{2} k21 - \frac{1}{2} k12 + \frac{1}{2} \sqrt{(k01 + k21 + k12)^2 - 4 k01 k12}}{k12} \right) \Bigg/ \\
\Rightarrow x1tau := & M1 \cdot \exp(la1 \cdot \tau) + M2 \cdot \exp(la2 \cdot \tau) + x1s \\
x1tau := & \left(\left(\frac{\left(x10 - \frac{Dose}{\tau k01} \right) k21}{\frac{1}{2} k12 - \frac{1}{2} k01 - \frac{1}{2} k21 - \frac{1}{2} \sqrt{(k01 + k21 + k12)^2 - 4 k01 k12}} \right)^{0.5} - x20 \right. \\
& \left. + \frac{Dose k21}{\tau k01 k12} \right) e^{\left(-\frac{1}{2} k01 - \frac{1}{2} k21 - \frac{1}{2} k12 + \frac{1}{2} \sqrt{(k01 + k21 + k12)^2 - 4 k01 k12} \right) \tau} \Bigg)
\end{aligned} \tag{10}$$

$$\begin{aligned}
& \left(\frac{k_{21}}{\frac{1}{2} k_{12} - \frac{1}{2} k_{01} - \frac{1}{2} k_{21} - \frac{1}{2} \sqrt{(k_{01} + k_{21} + k_{12})^2 - 4 k_{01} k_{12}}} \right)^{0.5} \\
& - \frac{\frac{1}{2} k_{01} + \frac{1}{2} k_{21} - \frac{1}{2} k_{12} + \frac{1}{2} \sqrt{(k_{01} + k_{21} + k_{12})^2 - 4 k_{01} k_{12}}} {k_{12}} \Bigg) \\
& + \left(\left(x_{20} - \frac{Dose k_{21}}{\tau k_{01} k_{12}} - \frac{\left(x_{10} - \frac{Dose}{\tau k_{01}} \right) \left(\frac{1}{2} k_{01} + \frac{1}{2} k_{21} - \frac{1}{2} k_{12} + \frac{1}{2} \sqrt{(k_{01} + k_{21} + k_{12})^2 - 4 k_{01} k_{12}} \right)} {k_{12}} \right. \right. \\
& \left. \left. \left(\frac{k_{21}}{\frac{1}{2} k_{12} - \frac{1}{2} k_{01} - \frac{1}{2} k_{21} - \frac{1}{2} \sqrt{(k_{01} + k_{21} + k_{12})^2 - 4 k_{01} k_{12}}} \right)^{0.5} \right. \right. \\
& \left. \left. - \frac{\frac{1}{2} k_{01} + \frac{1}{2} k_{21} - \frac{1}{2} k_{12} + \frac{1}{2} \sqrt{(k_{01} + k_{21} + k_{12})^2 - 4 k_{01} k_{12}}} {k_{12}} \right) \right) + \frac{Dose}{\tau k_{01}}
\end{aligned}$$

> $x2tau := M1 \cdot a \cdot \exp(la1 \cdot \tau) + M2 \cdot b \cdot \exp(la2 \cdot \tau) + x2s$

$$x2tau := \left(\left(\frac{\left(x_{10} - \frac{Dose}{\tau k_{01}} \right) k_{21}}{\left(\frac{1}{2} k_{12} - \frac{1}{2} k_{01} - \frac{1}{2} k_{21} - \frac{1}{2} \sqrt{(k_{01} + k_{21} + k_{12})^2 - 4 k_{01} k_{12}} \right)^{0.5}} - x_{20} \right. \right. \\
+ \frac{Dose k_{21}}{\tau k_{01} k_{12}} \Bigg) \left(\frac{1}{2} k_{01} + \frac{1}{2} k_{21} - \frac{1}{2} k_{12} + \frac{1}{2} \sqrt{(k_{01} + k_{21} + k_{12})^2 - 4 k_{01} k_{12}} \right. \\
\left. \left. \left. - 4 k_{01} k_{12} \right)^{0.5} \right) e^{\left(-\frac{1}{2} k_{01} - \frac{1}{2} k_{21} - \frac{1}{2} k_{12} + \frac{1}{2} \sqrt{(k_{01} + k_{21} + k_{12})^2 - 4 k_{01} k_{12}} \right) \tau} \right) \Bigg) \\
\left(\left(\frac{k_{21}}{\frac{1}{2} k_{12} - \frac{1}{2} k_{01} - \frac{1}{2} k_{21} - \frac{1}{2} \sqrt{(k_{01} + k_{21} + k_{12})^2 - 4 k_{01} k_{12}}} \right)^{0.5} \right. \\
\left. \left. - \frac{\frac{1}{2} k_{01} + \frac{1}{2} k_{21} - \frac{1}{2} k_{12} + \frac{1}{2} \sqrt{(k_{01} + k_{21} + k_{12})^2 - 4 k_{01} k_{12}}} {k_{12}} \right) k_{12} \right)$$

$$-\frac{\frac{1}{2} k_{01} + \frac{1}{2} k_{21} - \frac{1}{2} k_{12} + \frac{1}{2} ((k_{01} + k_{21} + k_{12})^2 - 4 k_{01} k_{12})^{0.5}}{k_{12}} \Bigg)$$

$$+ \left(x_{20} - \frac{Dose k_{21}}{\tau k_{01} k_{12}} - \frac{\left(x_{10} - \frac{Dose}{\tau k_{01}} \right) \left(\frac{1}{2} k_{01} + \frac{1}{2} k_{21} - \frac{1}{2} k_{12} + \frac{1}{2} ((k_{01} + k_{21} + k_{12})^2 - 4 k_{01} k_{12})^{0.5} \right)}{k_{12}} \right.$$

$$\left. \frac{k_{21}}{\frac{1}{2} k_{12} - \frac{1}{2} k_{01} - \frac{1}{2} k_{21} - \frac{1}{2} ((k_{01} + k_{21} + k_{12})^2 - 4 k_{01} k_{12})^{0.5}} \right)$$

$$-\frac{\frac{1}{2} k_{01} + \frac{1}{2} k_{21} - \frac{1}{2} k_{12} + \frac{1}{2} ((k_{01} + k_{21} + k_{12})^2 - 4 k_{01} k_{12})^{0.5}}{k_{12}} \Bigg) + \frac{Dose}{\tau k_{01}}$$

$$-\frac{\rho}{k_{01}} \Bigg) k_{21} \Bigg) \quad \left(\frac{1}{2} k_{12} - \frac{1}{2} k_{01} - \frac{1}{2} k_{21} - \frac{1}{2} ((k_{01} + k_{21} + k_{12})^2 - 4 k_{01} k_{12})^{0.5} \right)$$

$$- 4 k01 k12 \Big)^{0.5} \Big)$$

$$- \left(\left(\frac{\left(x10 - \frac{Dose}{\tau k01} \right) k21}{\frac{1}{2} k12 - \frac{1}{2} k01 - \frac{1}{2} k21 - \frac{1}{2} ((k01 + k21 + k12)^2 - 4 k01 k12)^{0.5}} - x20 + \frac{Dose k21}{\tau k01 k12} \right) \left(\frac{1}{2} k01 + \frac{1}{2} k21 - \frac{1}{2} k12 + \frac{1}{2} ((k01 + k21 + k12)^2 - 4 k01 k12)^{0.5} \right) \right)$$

$$- 4 k01 k12 \Big)^{0.5} \Big) e^{\left(- \frac{1}{2} k01 - \frac{1}{2} k21 - \frac{1}{2} k12 + \frac{1}{2} ((k01 + k21 + k12)^2 - 4 k01 k12)^{0.5} \right) \tau} \Bigg)$$

$$\left(\left(\frac{k21}{\frac{1}{2} k12 - \frac{1}{2} k01 - \frac{1}{2} k21 - \frac{1}{2} ((k01 + k21 + k12)^2 - 4 k01 k12)^{0.5}} \right. \right.$$

$$\left. \left. - \frac{\frac{1}{2} k01 + \frac{1}{2} k21 - \frac{1}{2} k12 + \frac{1}{2} ((k01 + k21 + k12)^2 - 4 k01 k12)^{0.5}}{k12} \right) k12 \right)$$

$$- \left(\left(x20 - \frac{Dose k21}{\tau k01 k12} - \frac{\left(x10 - \frac{Dose}{\tau k01} \right) \left(\frac{1}{2} k01 + \frac{1}{2} k21 - \frac{1}{2} k12 + \frac{1}{2} ((k01 + k21 + k12)^2 - 4 k01 k12)^{0.5} \right)}{k12} \right) \right)$$

$$\left(\left(\begin{array}{c}
\frac{k_{21}}{\frac{1}{2}k_{12} - \frac{1}{2}k_{01} - \frac{1}{2}k_{21} - \frac{1}{2}\sqrt{(k_{01} + k_{21} + k_{12})^2 - 4k_{01}k_{12}}} \\
- \frac{\frac{1}{2}k_{01} + \frac{1}{2}k_{21} - \frac{1}{2}k_{12} + \frac{1}{2}\sqrt{(k_{01} + k_{21} + k_{12})^2 - 4k_{01}k_{12}}}{k_{12}} \end{array} \right) \left(\frac{1}{2}k_{12} \right. \right. \\
\left. \left. - \frac{1}{2}k_{01} - \frac{1}{2}k_{21} - \frac{1}{2}\sqrt{(k_{01} + k_{21} + k_{12})^2 - 4k_{01}k_{12}} \right) \right) - \frac{Dose k_{21}}{\tau k_{01}k_{12}} \\
+ \frac{\rho k_{21}}{k_{01}k_{12}} \Bigg)$$

$$\left(\left(\begin{array}{c}
\frac{k_{21}}{\frac{1}{2}k_{12} - \frac{1}{2}k_{01} - \frac{1}{2}k_{21} - \frac{1}{2}\sqrt{(k_{01} + k_{21} + k_{12})^2 - 4k_{01}k_{12}}} \\
- \frac{\frac{1}{2}k_{01} + \frac{1}{2}k_{21} - \frac{1}{2}k_{12} + \frac{1}{2}\sqrt{(k_{01} + k_{21} + k_{12})^2 - 4k_{01}k_{12}}}{k_{12}} \end{array} \right) \right)$$

> N2 := $\frac{(x2tau - y2s) - \frac{(x1tau - y1s) \cdot a}{1}}{(b - a)}$

$$N2 := \left(\left(\frac{\left(x10 - \frac{Dose}{\tau k01} \right) k21}{\frac{1}{2} k12 - \frac{1}{2} k01 - \frac{1}{2} k21 - \frac{1}{2} ((k01 + k21 + k12)^2 - 4 k01 k12)^{0.5}} - x20 \right. \right.$$

$$\left. \left. + \frac{Dose k21}{\tau k01 k12} \right) \left(\frac{1}{2} k01 + \frac{1}{2} k21 - \frac{1}{2} k12 + \frac{1}{2} ((k01 + k21 + k12)^2 - 4 k01 k12)^{0.5} \right. \right)$$

$$\left. \left. e^{\left(-\frac{1}{2} k01 - \frac{1}{2} k21 - \frac{1}{2} k12 + \frac{1}{2} ((k01 + k21 + k12)^2 - 4 k01 k12)^{0.5} \right) \tau} \right) \right)$$

$$\left(\left(\frac{k_{21}}{\frac{1}{2} k_{12} - \frac{1}{2} k_{01} - \frac{1}{2} k_{21} - \frac{1}{2} \sqrt{(k_{01} + k_{21} + k_{12})^2 - 4 k_{01} k_{12}}} \right)^{0.5} \right.$$

$$- \left. \frac{\frac{1}{2} k_{01} + \frac{1}{2} k_{21} - \frac{1}{2} k_{12} + \frac{1}{2} \sqrt{(k_{01} + k_{21} + k_{12})^2 - 4 k_{01} k_{12}}}{k_{12}} \right)^{0.5} \Bigg) k_{12} \Bigg)$$

$$+ \left(\left(x_{20} - \frac{Dose k_{21}}{\tau k_{01} k_{12}} - \frac{\left(x_{10} - \frac{Dose}{\tau k_{01}} \right) \left(\frac{1}{2} k_{01} + \frac{1}{2} k_{21} - \frac{1}{2} k_{12} + \frac{1}{2} \sqrt{(k_{01} + k_{21} + k_{12})^2 - 4 k_{01} k_{12}}}{k_{12}} \right)^{0.5}}{k_{12}} \right)^{0.5} \right)$$

$$\left(\left(\frac{k_{21}}{\frac{1}{2} k_{12} - \frac{1}{2} k_{01} - \frac{1}{2} k_{21} - \frac{1}{2} \sqrt{(k_{01} + k_{21} + k_{12})^2 - 4 k_{01} k_{12}}} \right)^{0.5} \right)$$

$$-\frac{\frac{1}{2} k01 + \frac{1}{2} k21 - \frac{1}{2} k12 + \frac{1}{2} ((k01 + k21 + k12)^2 - 4 k01 k12)^{0.5}}{k12} \left(\frac{1}{2} k12 \right)$$

$$-\frac{1}{2} k01 - \frac{1}{2} k21 - \frac{1}{2} ((k01 + k21 + k12)^2 - 4 k01 k12)^{0.5} \right) + \frac{Dose k21}{\tau k01 k12}$$

$$-\frac{\rho k21}{k01 k12}$$

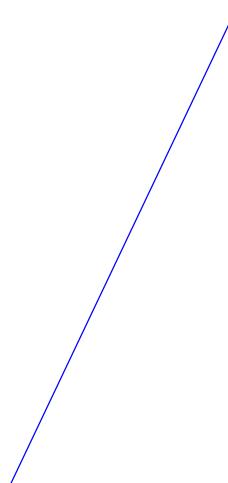
$$-\frac{1}{k12} \left(\left(\frac{x10 - \frac{Dose}{\tau k01} k21}{\frac{1}{2} k12 - \frac{1}{2} k01 - \frac{1}{2} k21 - \frac{1}{2} ((k01 + k21 + k12)^2 - 4 k01 k12)^{0.5}} \right) \right.$$

$$\left. -x20 + \frac{Dose k21}{\tau k01 k12} \right) e^{\left(-\frac{1}{2} k01 - \frac{1}{2} k21 - \frac{1}{2} k12 + \frac{1}{2} ((k01 + k21 + k12)^2 - 4 k01 k12)^{0.5} \right) \tau}$$

$$\left. - \frac{\frac{1}{2} k_{01} + \frac{1}{2} k_{21} - \frac{1}{2} k_{12} + \frac{1}{2} \left((k_{01} + k_{21} + k_{12})^2 - 4 k_{01} k_{12} \right)^{0.5}}{k_{12}} \right\}$$

$$+ \left(\left(x_{20} - \frac{Dose k_{21}}{\tau k_{01} k_{12}} - \frac{\left(x_{10} - \frac{Dose}{\tau k_{01}} \right) \left(\frac{1}{2} k_{01} + \frac{1}{2} k_{21} - \frac{1}{2} k_{12} + \frac{1}{2} \left((k_{01} + k_{21} + k_{12})^2 - 4 k_{01} k_{12} \right)^{0.5} \right)}{k_{12}} \right. \right.$$

$$\left. \left. - \frac{\frac{1}{2} k_{01} + \frac{1}{2} k_{21} - \frac{1}{2} k_{12} + \frac{1}{2} \left((k_{01} + k_{21} + k_{12})^2 - 4 k_{01} k_{12} \right)^{0.5}}{k_{12}} \right) + \frac{Dose}{\tau k_{01}} \right. \\ \left. - \frac{\rho}{k_{01}} \right) \left(\frac{1}{2} k_{01} + \frac{1}{2} k_{21} - \frac{1}{2} k_{12} + \frac{1}{2} \left((k_{01} + k_{21} + k_{12})^2 - 4 k_{01} k_{12} \right)^{0.5} \right) \right)$$



$$\left\{ \begin{array}{l} \frac{k_{21}}{\frac{1}{2}k_{12} - \frac{1}{2}k_{01} - \frac{1}{2}k_{21} - \frac{1}{2}\left((k_{01} + k_{21} + k_{12})^2 - 4k_{01}k_{12}\right)^{0.5}} \\ - \frac{\frac{1}{2}k_{01} + \frac{1}{2}k_{21} - \frac{1}{2}k_{12} + \frac{1}{2}\left((k_{01} + k_{21} + k_{12})^2 - 4k_{01}k_{12}\right)^{0.5}}{k_{12}} \end{array} \right\}$$

> $eq1 := NI = 190.862$

$$eq1 := \left(\left(\left(\frac{\left(x10 - \frac{Dose}{\tau k_{01}}\right) k_{21}}{\frac{1}{2}k_{12} - \frac{1}{2}k_{01} - \frac{1}{2}k_{21} - \frac{1}{2}\left((k_{01} + k_{21} + k_{12})^2 - 4k_{01}k_{12}\right)^{0.5}} - x20 \right. \right. \right. \right. \\ \left. \left. \left. \left. + \frac{Dose k_{21}}{\tau k_{01} k_{12}} \right) e^{\left(-\frac{1}{2}k_{01} - \frac{1}{2}k_{21} - \frac{1}{2}k_{12} + \frac{1}{2}\left((k_{01} + k_{21} + k_{12})^2 - 4k_{01}k_{12}\right)^{0.5}\right)\tau} \right) \right)$$

$$\left\{ \begin{array}{l} \frac{k_{21}}{\frac{1}{2}k_{12} - \frac{1}{2}k_{01} - \frac{1}{2}k_{21} - \frac{1}{2}\left((k_{01} + k_{21} + k_{12})^2 - 4k_{01}k_{12}\right)^{0.5}} \\ - \frac{\frac{1}{2}k_{01} + \frac{1}{2}k_{21} - \frac{1}{2}k_{12} + \frac{1}{2}\left((k_{01} + k_{21} + k_{12})^2 - 4k_{01}k_{12}\right)^{0.5}}{k_{12}} \end{array} \right\}$$

$$+ \left(x_{20} - \frac{Dose k_{21}}{\tau k_{01} k_{12}} - \frac{\left(x_{10} - \frac{Dose}{\tau k_{01}} \right) \left(\frac{1}{2} k_{01} + \frac{1}{2} k_{21} - \frac{1}{2} k_{12} + \frac{1}{2} ((k_{01} + k_{21} + k_{12})^2 - 4 k_{01} k_{12})^{0.5} \right)}{k_{12}} \right)$$

$$\left(\frac{k_{21}}{\frac{1}{2} k_{12} - \frac{1}{2} k_{01} - \frac{1}{2} k_{21} - \frac{1}{2} ((k_{01} + k_{21} + k_{12})^2 - 4 k_{01} k_{12})^{0.5}} \right)$$

$$- \frac{\frac{1}{2} k_{01} + \frac{1}{2} k_{21} - \frac{1}{2} k_{12} + \frac{1}{2} ((k_{01} + k_{21} + k_{12})^2 - 4 k_{01} k_{12})^{0.5}}{k_{12}} \right) + \frac{Dose}{\tau k_{01}}$$

$$\left. \left(\frac{1}{2} k_{12} - \frac{1}{2} k_{01} - \frac{1}{2} k_{21} - \frac{1}{2} ((k_{01} + k_{21} + k_{12})^2 - 4 k_{01} k_{12})^{0.5} \right) k_{21} \right)$$

$$- 4 k_{01} k_{12})^{0.5} \right)$$

$$-\left(\left(\frac{x10 - \frac{Dose}{\tau k01} k21}{\frac{1}{2} k12 - \frac{1}{2} k01 - \frac{1}{2} k21 - \frac{1}{2} ((k01 + k21 + k12)^2 - 4 k01 k12)^{0.5}} - x20 + \frac{Dose k21}{\tau k01 k12} \right) \left(\frac{1}{2} k12 - \frac{1}{2} k01 - \frac{1}{2} k21 - \frac{1}{2} ((k01 + k21 + k12)^2 - 4 k01 k12)^{0.5} \right)^{0.5} \right)$$

$$\left(\left(\frac{k21}{\frac{1}{2} k12 - \frac{1}{2} k01 - \frac{1}{2} k21 - \frac{1}{2} ((k01 + k21 + k12)^2 - 4 k01 k12)^{0.5}} - 4 k01 k12 \right)^{0.5} e^{\left(-\frac{1}{2} k01 - \frac{1}{2} k21 - \frac{1}{2} k12 + \frac{1}{2} ((k01 + k21 + k12)^2 - 4 k01 k12)^{0.5} \right) \tau} \right)$$

$$\left(\left(\frac{k21}{\frac{1}{2} k12 - \frac{1}{2} k01 - \frac{1}{2} k21 - \frac{1}{2} ((k01 + k21 + k12)^2 - 4 k01 k12)^{0.5}} - 4 k01 k12 \right)^{0.5} \right)$$

$$\left(\left(\frac{\frac{1}{2} k01 + \frac{1}{2} k21 - \frac{1}{2} k12 + \frac{1}{2} ((k01 + k21 + k12)^2 - 4 k01 k12)^{0.5}}{k12} \right) k12 \right)$$

$$-\left(\left(x20 - \frac{Dose k21}{\tau k01 k12} - \frac{\left(x10 - \frac{Dose}{\tau k01} \right) \left(\frac{1}{2} k01 + \frac{1}{2} k21 - \frac{1}{2} k12 + \frac{1}{2} ((k01 + k21 + k12)^2 - 4 k01 k12)^{0.5} \right)}{k12} \right) \left(\frac{1}{2} k12 - \frac{1}{2} k01 - \frac{1}{2} k21 - \frac{1}{2} ((k01 + k21 + k12)^2 - 4 k01 k12)^{0.5} \right)^{0.5} \right)$$

$$\left(\left(\frac{k21}{\frac{1}{2} k12 - \frac{1}{2} k01 - \frac{1}{2} k21 - \frac{1}{2} ((k01 + k21 + k12)^2 - 4 k01 k12)^{0.5}} - 4 k01 k12 \right)^{0.5} \right) \left(\frac{1}{2} k12 - \frac{1}{2} k01 - \frac{1}{2} k21 - \frac{1}{2} ((k01 + k21 + k12)^2 - 4 k01 k12)^{0.5} \right)^{0.5}$$

$$\begin{aligned}
& \left. \left(-\frac{1}{2} k_{01} I - \frac{1}{2} k_{21} I - \frac{1}{2} \left((k_{01} + k_{21} + k_{12})^2 - 4 k_{01} k_{12} \right)^{0.5} \right) \right) - \frac{Dose k_{21}}{\tau k_{01} k_{12}} \\
& + \frac{\rho k_{21}}{k_{01} k_{12}} \right) \\
& \left. \left(\frac{k_{21}}{\frac{1}{2} k_{12} - \frac{1}{2} k_{01} - \frac{1}{2} k_{21} - \frac{1}{2} \left((k_{01} + k_{21} + k_{12})^2 - 4 k_{01} k_{12} \right)^{0.5}} \right. \right. \\
& \left. \left. - \frac{\frac{1}{2} k_{01} + \frac{1}{2} k_{21} - \frac{1}{2} k_{12} + \frac{1}{2} \left((k_{01} + k_{21} + k_{12})^2 - 4 k_{01} k_{12} \right)^{0.5}}{k_{12}} \right) \right) = 190.862
\end{aligned}$$

> $eq2 := N2 = 195.523$

$$eq2 := \left(\left(\frac{x10 - \frac{Dose}{\tau k_{01}} k_{21}}{\frac{1}{2} k_{12} - \frac{1}{2} k_{01} - \frac{1}{2} k_{21} - \frac{1}{2} \left((k_{01} + k_{21} + k_{12})^2 - 4 k_{01} k_{12} \right)^{0.5}} - x20 \right) \right)$$

$$+ \frac{Dose k_{2I}}{\tau k_{0I} k_{12}} \Bigg) \left(\frac{1}{2} k_{0I} + \frac{1}{2} k_{2I} - \frac{1}{2} k_{12} + \frac{1}{2} ((k_{0I} + k_{2I} + k_{12})^2 \right.$$

$$\left. - 4 k_{0I} k_{12})^{0.5} \right) e^{\left(-\frac{1}{2} k_{0I} - \frac{1}{2} k_{2I} - \frac{1}{2} k_{12} + \frac{1}{2} ((k_{0I} + k_{2I} + k_{12})^2 - 4 k_{0I} k_{12})^{0.5} \right) \tau} \Bigg)$$

$$\left(\left(\frac{k_{2I}}{\frac{1}{2} k_{12} - \frac{1}{2} k_{0I} - \frac{1}{2} k_{2I} - \frac{1}{2} ((k_{0I} + k_{2I} + k_{12})^2 - 4 k_{0I} k_{12})^{0.5}} \right) \right)$$

$$\begin{aligned}
& - \left. \frac{\frac{1}{2} k_{01} + \frac{1}{2} k_{21} - \frac{1}{2} k_{12} + \frac{1}{2} ((k_{01} + k_{21} + k_{12})^2 - 4 k_{01} k_{12})^{0.5}}{k_{12}} \right) k_{12} \\
& + \left(\left(x_{20} - \frac{Dose k_{21}}{\tau k_{01} k_{12}} - \frac{\left(x_{10} - \frac{Dose}{\tau k_{01}} \right) \left(\frac{1}{2} k_{01} + \frac{1}{2} k_{21} - \frac{1}{2} k_{12} + \frac{1}{2} ((k_{01} + k_{21} + k_{12})^2 - 4 k_{01} k_{12})^{0.5}}{k_{12}} \right. \right. \right. \right. \\
& \left. \left. \left. \left. \left(\frac{k_{21}}{\frac{1}{2} k_{12} - \frac{1}{2} k_{01} - \frac{1}{2} k_{21} - \frac{1}{2} ((k_{01} + k_{21} + k_{12})^2 - 4 k_{01} k_{12})^{0.5}} \right. \right. \right. \right. \\
& \left. \left. \left. \left. \left. \left(\frac{\frac{1}{2} k_{01} + \frac{1}{2} k_{21} - \frac{1}{2} k_{12} + \frac{1}{2} ((k_{01} + k_{21} + k_{12})^2 - 4 k_{01} k_{12})^{0.5}}{k_{12}} \right) \left(\frac{1}{2} k_{12} \right) \right) \right) \right) \right)
\end{aligned}$$

$$-\frac{1}{2} k01 - \frac{1}{2} k21 - \frac{1}{2} \left((k01 + k21 + k12)^2 - 4 k01 k12 \right)^{0.5} \right) \Bigg) + \frac{Dose k21}{\tau k01 k12}$$

$$-\frac{\rho k21}{k01 k12}$$

$$-\frac{1}{k12} \left(\left(\left(\frac{x10 - \frac{Dose}{\tau k01}}{\frac{1}{2} k12 - \frac{1}{2} k01 - \frac{1}{2} k21 - \frac{1}{2} \left((k01 + k21 + k12)^2 - 4 k01 k12 \right)^{0.5}} \right) k21 \right) \right)$$

$$-x20 + \frac{Dose k21}{\tau k01 k12} \right) e^{\left(-\frac{1}{2} k01 - \frac{1}{2} k21 - \frac{1}{2} k12 + \frac{1}{2} \left((k01 + k21 + k12)^2 - 4 k01 k12 \right)^{0.5} \right) \tau} \Bigg)$$

$$\left(\frac{k21}{\frac{1}{2} k12 - \frac{1}{2} k01 - \frac{1}{2} k21 - \frac{1}{2} \left((k01 + k21 + k12)^2 - 4 k01 k12 \right)^{0.5}} \right)$$

$$- \frac{\frac{1}{2} k_{01} + \frac{1}{2} k_{21} - \frac{1}{2} k_{12} + \frac{1}{2} ((k_{01} + k_{21} + k_{12})^2 - 4 k_{01} k_{12})^{0.5}}{k_{12}} \Bigg)$$

$$+ \left(x_{20} - \frac{Dose k_{21}}{\tau k_{01} k_{12}} - \frac{\left(x_{10} - \frac{Dose}{\tau k_{01}} \right) \left(\frac{1}{2} k_{01} + \frac{1}{2} k_{21} - \frac{1}{2} k_{12} + \frac{1}{2} ((k_{01} + k_{21} + k_{12})^2 - 4 k_{01} k_{12})^{0.5} \right)}{k_{12}} \right.$$

$$\left. - \frac{\frac{k_{21}}{\frac{1}{2} k_{12} - \frac{1}{2} k_{01} - \frac{1}{2} k_{21} - \frac{1}{2} ((k_{01} + k_{21} + k_{12})^2 - 4 k_{01} k_{12})^{0.5}}}{k_{12}} \right) + \frac{Dose}{\tau k_{01}}$$

$$- \frac{\rho}{k_{01}} \Bigg) \left(\frac{1}{2} k_{01} + \frac{1}{2} k_{21} - \frac{1}{2} k_{12} + \frac{1}{2} ((k_{01} + k_{21} + k_{12})^2 - 4 k_{01} k_{12})^{0.5} \right) \Bigg)$$

$$\left(\frac{\frac{k_{21}}{\frac{1}{2} k_{12} - \frac{1}{2} k_{01} - \frac{1}{2} k_{21} - \frac{1}{2} ((k_{01} + k_{21} + k_{12})^2 - 4 k_{01} k_{12})^{0.5}}}{k_{12}} \right. \\ \left. - \frac{\frac{1}{2} k_{01} + \frac{1}{2} k_{21} - \frac{1}{2} k_{12} + \frac{1}{2} ((k_{01} + k_{21} + k_{12})^2 - 4 k_{01} k_{12})^{0.5}}{k_{12}} \right) = 195.523$$

> $eq3 := lal = -6.298 \cdot 10^{-3}$

$$eq3 := -\frac{1}{2} k01 - \frac{1}{2} k21 - \frac{1}{2} k12 + \frac{1}{2} ((k01 + k21 + k12)^2 - 4 k01 k12)^{0.5} = \quad (17)$$

-0.006298000000

$$> eq4 := la2 = -0.052 \\ eq4 := -\frac{1}{2} k01 - \frac{1}{2} k21 - \frac{1}{2} k12 - \frac{1}{2} ((k01 + k21 + k12)^2 - 4 k01 k12)^{0.5} = -0.052 \quad (18)$$

$$> Dose := 2500; \tau := 1; \rho := 0; x10 := 0; x20 := 0 \\ Dose := 2500$$

$\tau := 1$

$\rho := 0$

$x10 := 0$

$x20 := 0$

(19)

$$> solve([eq1, eq2, eq3, eq4], [k01, k21, k12]) \\ [] \quad (20)$$

>