

$$\begin{aligned} > \text{ode1} := \text{diff}(x1(t), t) = D - (k01 + k21) \cdot x1(t) + k12 \cdot x2(t) \\ \text{ode1} := \frac{d}{dt} x1(t) = D - (k01 + k21) x1(t) + k12 x2(t) \end{aligned} \quad (1)$$

$$\begin{aligned} > \text{ode2} := \text{diff}(x2(t), t) = k21 \cdot x1(t) - k12 \cdot x2(t) \\ \text{ode2} := \frac{d}{dt} x2(t) = k21 x1(t) - k12 x2(t) \end{aligned} \quad (2)$$

$$\begin{aligned} > \text{ics} := D = 1000, x1(0) = 20, x2(0) = 0 \\ \text{ics} := D = 1000, x1(0) = 20, x2(0) = 0 \end{aligned} \quad (3)$$

$$\begin{aligned} > \text{odes} := \{\text{ode1}, \text{ode2}\} \\ \text{odes} := \left\{ \frac{d}{dt} x1(t) = D - (k01 + k21) x1(t) + k12 x2(t), \frac{d}{dt} x2(t) = k21 x1(t) - k12 x2(t) \right\} \end{aligned} \quad (4)$$

$$\begin{aligned} > \text{dsolve}(\text{odes}) \\ \left\{ x2(t) = -\frac{1}{2} \frac{1}{k12 k01} \left( -2 D k21 \right. \right. \end{aligned} \quad (5)$$

$$- k01^2 \_C1 e^{\left( -\frac{1}{2} k01 - \frac{1}{2} k21 - \frac{1}{2} k12 - \frac{1}{2} \sqrt{k01^2 + 2 k01 k21 - 2 k12 k01 + k21^2 + 2 k21 k12 + k12^2} \right) t}$$

$$- \_C1 k21 e^{\left( -\frac{1}{2} k01 - \frac{1}{2} k21 - \frac{1}{2} k12 - \frac{1}{2} \sqrt{k01^2 + 2 k01 k21 - 2 k12 k01 + k21^2 + 2 k21 k12 + k12^2} \right) t} k01$$

$$+ \_C1 e^{\left( -\frac{1}{2} k01 - \frac{1}{2} k21 - \frac{1}{2} k12 - \frac{1}{2} \sqrt{k01^2 + 2 k01 k21 - 2 k12 k01 + k21^2 + 2 k21 k12 + k12^2} \right) t} k12 k01$$

$$+ \_C1 \sqrt{k01^2 + 2 k01 k21 - 2 k12 k01 + k21^2 + 2 k21 k12 + k12^2}$$

$$e^{\left( -\frac{1}{2} k01 - \frac{1}{2} k21 - \frac{1}{2} k12 - \frac{1}{2} \sqrt{k01^2 + 2 k01 k21 - 2 k12 k01 + k21^2 + 2 k21 k12 + k12^2} \right) t} k01$$

$$- k01^2 \_C2 e^{\left( -\frac{1}{2} k01 - \frac{1}{2} k21 - \frac{1}{2} k12 + \frac{1}{2} \sqrt{k01^2 + 2 k01 k21 - 2 k12 k01 + k21^2 + 2 k21 k12 + k12^2} \right) t}$$

$$- \_C2 k21 e^{\left( -\frac{1}{2} k01 - \frac{1}{2} k21 - \frac{1}{2} k12 + \frac{1}{2} \sqrt{k01^2 + 2 k01 k21 - 2 k12 k01 + k21^2 + 2 k21 k12 + k12^2} \right) t} k01$$

$$+ \_C2 e^{\left( -\frac{1}{2} k01 - \frac{1}{2} k21 - \frac{1}{2} k12 + \frac{1}{2} \sqrt{k01^2 + 2 k01 k21 - 2 k12 k01 + k21^2 + 2 k21 k12 + k12^2} \right) t} k12 k01$$

$$- \_C2 \sqrt{k01^2 + 2 k01 k21 - 2 k12 k01 + k21^2 + 2 k21 k12 + k12^2}$$

$$e^{\left( -\frac{1}{2} k01 - \frac{1}{2} k21 - \frac{1}{2} k12 + \frac{1}{2} \sqrt{k01^2 + 2 k01 k21 - 2 k12 k01 + k21^2 + 2 k21 k12 + k12^2} \right) t} k01 \Big), x1(t) = \frac{1}{k01} \left( D \right.$$

$$+ k01 \_C1 e^{\left( -\frac{1}{2} k01 - \frac{1}{2} k21 - \frac{1}{2} k12 - \frac{1}{2} \sqrt{k01^2 + 2 k01 k21 - 2 k12 k01 + k21^2 + 2 k21 k12 + k12^2} \right) t}$$

$$+ k01 \_C2 e^{\left( -\frac{1}{2} k01 - \frac{1}{2} k21 - \frac{1}{2} k12 + \frac{1}{2} \sqrt{k01^2 + 2 k01 k21 - 2 k12 k01 + k21^2 + 2 k21 k12 + k12^2} \right) t} \Big\}$$

