

$$\begin{aligned}
& \text{restart} \\
& KCLn1 := \text{diff}(vc(t), t) = 10 - 1 \cdot il(t) \\
& \qquad KCLn1 := \frac{d}{dt} vc(t) = 10 - il(t) \tag{1} \\
& KCLn2a := \text{diff}(il(t), t) = -5 \cdot il(t) + 4 \cdot vc(t) \\
& \qquad KCLn2a := \frac{d}{dt} il(t) = -5 il(t) + 4 vc(t) \tag{2} \\
& KCLn2b := \text{diff}(il(t), t) = -5 \cdot il(t) + 4 \cdot vc(t) + 3 \\
& \qquad KCLn2b := \frac{d}{dt} il(t) = -5 il(t) + 4 vc(t) + 3 \tag{3} \\
& eqnsa := KCLn1, KCLn2a \\
& \qquad eqnsa := \frac{d}{dt} vc(t) = 10 - il(t), \frac{d}{dt} il(t) = -5 il(t) + 4 vc(t) \tag{4} \\
& solna := \text{dsolve}(\{eqnsa, vc(0) = 1, il(0) = 3\}, [vc(t), il(t)]) \\
& \qquad solna := \left\{ il(t) = 6 e^{-4t} - 13 e^{-t} + 10, vc(t) = \frac{3 e^{-4t}}{2} - 13 e^{-t} + \frac{25}{2} \right\} \tag{5} \\
& \text{simplify(solna)} \\
& \qquad \left\{ il(t) = 6 e^{-4t} - 13 e^{-t} + 10, vc(t) = \frac{3 e^{-4t}}{2} - 13 e^{-t} + \frac{25}{2} \right\} \tag{6} \\
& eqnsb := KCLn1, KCLn2b \\
& \qquad eqnsb := \frac{d}{dt} vc(t) = 10 - il(t), \frac{d}{dt} il(t) = -5 il(t) + 4 vc(t) + 3 \tag{7} \\
& solnb := \text{dsolve}(\{eqnsb, vc(0) = 1, il(0) = 3\}, [vc(t), il(t)]) \\
& \qquad solnb := \left\{ il(t) = 5 e^{-4t} - 12 e^{-t} + 10, vc(t) = \frac{5 e^{-4t}}{4} - 12 e^{-t} + \frac{47}{4} \right\} \tag{8} \\
& \text{simplify(solnb)} \\
& \qquad \left\{ il(t) = 5 e^{-4t} - 12 e^{-t} + 10, vc(t) = \frac{5 e^{-4t}}{4} - 12 e^{-t} + \frac{47}{4} \right\} \tag{9}
\end{aligned}$$