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> restart
> KCLn1 := diff(vc(t), t) = 10 - 1 · il(t)

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$$KCLn1 := \frac{d}{dt} vc(t) = 10 - il(t) \quad (1)$$

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> KCLn2a := diff(il(t), t) = -2 · il(t) + 5 · vc(t)

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$$KCLn2a := \frac{d}{dt} il(t) = -2 il(t) + 5 vc(t) \quad (2)$$

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> KCLn2b := diff(il(t), t) = -2 · il(t) + 5 · vc(t) + 3

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$$KCLn2b := \frac{d}{dt} il(t) = -2 il(t) + 5 vc(t) + 3 \quad (3)$$

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> eqnsa := KCLn1, KCLn2a

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$$eqnsa := \frac{d}{dt} vc(t) = 10 - il(t), \frac{d}{dt} il(t) = -2 il(t) + 5 vc(t) \quad (4)$$

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> solna := dsolve({eqnsa, vc(0) = 1, il(0) = 3}, [vc(t), il(t)])

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$$solna := \left\{ il(t) = 10 + e^{-t} (-4 \sin(2t) - 7 \cos(2t)), vc(t) = 4 - \frac{e^{-t} (-10 \sin(2t) + 15 \cos(2t))}{5} \right\} \quad (5)$$

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> simplify(solna)

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$$\{ il(t) = 10 + e^{-t} (-4 \sin(2t) - 7 \cos(2t)), vc(t) = 4 + (-3 \cos(2t) + 2 \sin(2t)) e^{-t} \} \quad (6)$$

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> eqnsb := KCLn1, KCLn2b

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$$eqnsb := \frac{d}{dt} vc(t) = 10 - il(t), \frac{d}{dt} il(t) = -2 il(t) + 5 vc(t) + 3 \quad (7)$$

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> solnb := dsolve({eqnsb, vc(0) = 1, il(0) = 3}, [vc(t), il(t)])

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$$solnb := \left\{ il(t) = 10 + e^{-t} \left(-\frac{5 \sin(2t)}{2} - 7 \cos(2t) \right), vc(t) = \frac{17}{5} - \frac{e^{-t} \left(-\frac{23 \sin(2t)}{2} + 12 \cos(2t) \right)}{5} \right\} \quad (8)$$

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> simplify(solnb)

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$$\left\{ il(t) = 10 + \frac{(-14 \cos(2t) - 5 \sin(2t)) e^{-t}}{2}, vc(t) = \frac{17}{5} + \frac{(-24 \cos(2t) + 23 \sin(2t)) e^{-t}}{10} \right\} \quad (9)$$

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