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[> restart: with(inttrans) : with(LinearAlgebra) :
[> A := Matrix([[0, -1, 0, -1], [1, 0, 0, 0], [0, 1, 0, 0], [0, 0, 1, 0]]) :
[> f0 := Vector([1, 0, 2, 1]) : # we willen de vierde component calculeren
[> f := simplify(MatrixExponential(A, t) • f0)[4]

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$$f := \frac{2\sqrt{3} \left(e^{-\frac{t}{2}} + \frac{3e^{\frac{t}{2}}}{2} \right) \sin\left(\frac{\sqrt{3}t}{2}\right)}{3} + e^{-\frac{t}{2}} \cos\left(\frac{\sqrt{3}t}{2}\right) \quad (1)$$

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[> # ii
[> f0 := Vector([1, 0, 2, 1, 1]) :
[> A := Matrix([[0, -1, 0, -1, 2], [1, 0, 0, 0, 0], [0, 1, 0, 0, 0], [0, 0, 1, 0, 0], [0, 0, 0,
0, 0]]) :
[> f := simplify(MatrixExponential(A, t) • f0)[4]

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$$f := \left(e^{-\frac{t}{2}} + \frac{2e^{\frac{t}{2}}}{3} \right) \sqrt{3} \sin\left(\frac{\sqrt{3}t}{2}\right) - e^{\frac{t}{2}} \cos\left(\frac{\sqrt{3}t}{2}\right) + 2 \quad (2)$$