

$x' = \{\{1, 3\}, \{4, 5\}\}x$ [Examples](#) [Random](#)

Input:

$$\vec{x}'(t) = \begin{pmatrix} 1 & 3 \\ 4 & 5 \end{pmatrix} \cdot \vec{x}(t)$$

ODE classification:

First-order system of linear differential equations

Differential equation solution:

$$\vec{x}(t) = \begin{pmatrix} \frac{1}{4} c_1 e^{-t} (e^{8t} + 3) + \frac{3}{8} c_2 e^{-t} (e^{8t} - 1) \\ \frac{1}{2} c_1 e^{-t} (e^{8t} - 1) + \frac{1}{4} c_2 e^{-t} (3 e^{8t} + 1) \end{pmatrix}$$