

DEN: lab #11 (coronaversion)

Today we will look at two types of problems that will not be on the exam, but we should know that they can be handled by appropriate algorithms.

1. Transform the equation $y'' - 6y' + 9y = 0$ into a system of equations of order 1, and then solve this system using the matrix approach.
2. Consider the non-homogeneous system

$$\begin{aligned}y_1' &= 2y_1 - y_2 + 4e^{4x} \\ y_2' &= -2y_1 + y_2 + 2e^x.\end{aligned}$$

In the previous homework we found the solution of the associated homogeneous version, namely

$$\begin{aligned}y_{1h}(x) &= a + b e^{3x}, \\ y_{2h}(x) &= 2a - b e^{3x}.\end{aligned}$$

Find a general solution of the given system

- a) using the row version of the method of variation;
- b) using the guessing method (of undetermined coefficients).