

Week 5

- **Method of undetermined coefficients**

- Find the general form of the solution (with abstract coefficients) and use the stability result to determine they will have a globally stable solution.

1. $y'' - 2y' - 3y = 3e^{2t}$,

2. $y'' - y' - 2y = -2t + 4t^2$,

3. $y'' + 2y' + y = 3 + 4\sin(2t)$

- Find the solution (with explicit coefficients) of the given IVP:

$$y'' + y' - 2y = 2t, y(0) = 0, y'(0) = 1.$$

- **Variation of parameters**

- Below you are given the fundamental solutions y_1, y_2 of the homogeneous problem. Use them to find the solution of the nonhomogeneous one.

1. $t^2y'' - 2y = 3t^2 - 1$ with $y_1 = t^2, y_2 = t^{-1}$,

2. $t^2y'' - t(t+2)y' + (t+2)y = 2t^3$ with $y_1 = t, y_2 = te^t$.