To do List

1. Watch videos on the Introduction to the Variation of Parameters, the general case and the Example and make detailed notes.

2. Attempt the problems below

3. **NOTE:** I will not collect the worksheet problems. These problems are meant to check your understanding and generate questions to ask me during office hours if you get stuck.

Objectives

By the end of this lecture you should be able to

1. Use the **variation of parameters** technique to solve second order problems with a right hand side that does not fit into categories of the method of undetermined coefficients.

Find the general solution for

1. $y'' - 2y' + y = \dfrac{e^t}{1 + t^2}$ *Your solution should be:*

$$y(t) = c_1 e^t + c_2 t e^t - \frac{1}{2} e^t \ln\left(1 + t^2\right) + t e^t \arctan(t)$$

2. $4y'' + y = 2\sec(t/2), \; -\pi < t < \pi$ *Your solution should be:*

$$y(t) = c_1 \cos(t/2) + c_2 \sin(t/2) + 2\cos(t/2) \ln(cos(t/2)) + t \sin(t/2)$$

Additional Reading/ Examples

Section 3.6 pages 142-143 (Example 1)