

### To do List

1. Check solutions to worksheet (03/23)
2. This is a catch up lecture. Review material from Chapter 3.5 and start working on **Homework 7**
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. Catch up on material from Chapter 3.5. The **summary** sheet gives a good overview of how to handle the different cases we have covered for the non-homogeneous problems.
  2. Start **Homework 7**
  3. I have attached an additional example below
1. **Example:** Find the form for a particular solution to

$$y'' + 2y' + 2y = 5te^t \cos(t)$$

#### Solution

The characteristic polynomial  $r^2 + 2r + 2 = 0$  has complex roots  $r_1 = 1 + i, r_2 = 1 - i$  therefore the complimentary solution  $y_c(t) = e^t \cos(t) + e^t \sin(t)$ . Since the right hand side involves  $e^t \cos(t)$  we can are in **case (c) of our summary list** and  $s = 1$  and

$$y_p(t) = t(A_0 + A_1t)e^t \cos(t) + t(B_0 + B_1t)e^t \sin(t)$$

### Additional Reading/ Examples

Section 3.5 pages 138 –141