Worksheet 03/30

Today we will explore free oscillations with damping.

To do List

1. Check solutions to worksheet (04/03)

2. Watch the videos on damped systems, take detailed notes then and attempt the problem below.

3. Start Homework 8.

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. Understand how the second order constant coefficients ODE models a spring mass system with damping.

2. Understand the difference between *overdamped, underdamped* and *critically damped* systems.

Problem

1. For each of the following spring-mass equations, determine whether the system is undamped, under-damped, critically damped, or overdamped and whether it is forced or unforced.

(a) $2y'' + 4y' + 6y = 0$

(b) $y'' + 5y = 0$

(c) $3y'' + y' + \frac{1}{2}y = \sin(t)$

(d) $y'' + 4y' + 4y = 1$

(e) $2y'' + 10y' + y = e^t$

(f) $100y'' + 10y' + 0.02y = 0$

Reading

Pages 152-156.