Second Order Equations

Solving second order linear non-homogeneous differential equations

Objectives

Students should be able to do the following:

- To solve second order, linear, non-homogeneous differential equations with simple sources.
- To compute the Laplace transform of simple functions.
- To use the Laplace transform to solve second order, linear differential equations.

Recitation Worksheet Problems: Sections 2.3, 3.1, 3.2

(1) Use the **undetermined coefficients method** to find the general solution of

$$y'' + 5y' + 6y = 3\sin(2t).$$

(2) Solve the initial value problem

$$y'' + 5y' + 6y = e^{-3t}, \qquad y(0) = 0, \qquad y'(0) = 0.$$

using

(2.1) the **undetermined coefficients** method;

(2.2) the **Laplace transform** method.

Note: When using the Laplace transform method, expand your solution using partial fractions. To save time, you do not need to find the exact values of the constants in this expansion, just name them a, b, and c. Your final solution for $y(t)$ could involve general constants a, b, and c.