Section 5.6 : Discontinuous Forcing Functions

Chapter 5 : The Laplace Transform

Math 2552 Differential Equations
Topics
We will cover these topics in this section.

1. Constant coefficient second order differential equations with discontinuous forcing functions.

Objectives
For the topics covered in this section, students are expected to be able to do the following.

1. Solve IVPs with discontinuous forcing functions using the Laplace Transform
Examples

Solve the following IVPs using the Laplace Transform.

1. \( y'' + 4y = g, \quad y(0) = y'(0) = 0, \quad g(t) = \begin{cases} 1 & 0 \leq t < 1 \\ -1 & 1 \leq t < 2 \\ 0 & \text{else} \end{cases} \)

2. \( y'' + 4y' + 4y = g, \quad y(0) = y'(0) = 0, \quad g(t) = u_{\pi} - u_{2\pi} \)