

Homework 7

All initial value problems are to be solved using the Laplace transform.

1. $y' + 4y = e^{-4t}$, $y(0) = 2$,

2. $y'' - 6y' + 9y = t$, $y(0) = 0, y'(0) = 1$,

3. $y'' - y' = e^t \cos t$, $y(0) = 0, y'(0) = 0$.

4. $y' + 2y = f(t)$, $y(0) = 0$, where

$$f(t) = \begin{cases} t, & 0 \leq t < 1 \\ 0, & t \geq 1. \end{cases}$$

5. $y'' + 4y = \sin t \mathcal{U}(t - 2\pi)$, $y(0) = 1, y'(0) = 0$.