

LECTURE 6 (267)

Practice Exam 3(Chapter 4)

Problem 1. Find a function $f(t)$ such that $\mathcal{L}\{f(t)\} = 2 \ln \frac{s^2+1}{(s+2)(s-3)}$.

Problem 2. Find a solution to the initial value problem

$$x'' + 2x' + x = \delta(t - 5) + \sin(t), \quad x(0) = 1, x'(0) = 0.$$

Problem 3. Find a nontrivial solution to the ordinary differential equation

$$tx'' - 4x' + tx = 0$$

such that $x(0) = 0$.

Problem 4. Solve the initial value problem

$$x'' + 2x' - 8x = e^{-5t} + 3u(t - 4), \quad x(0) = x'(0) = 1.$$