

Practice

§6.1: 5,12,13,14

§6.2: 1,3,8,12,13,19

§6.3: 9,10,20,22

Hand In

37) Calculate $\mathcal{L}(e^{at} \sinh(bt))$ (for $a, b \in \mathbb{R}$).

38) Find a function $f(t)$ such that

$$\mathcal{L}(f(t)) = \frac{3s + 2}{(s^2 + 2s + 3)(s - 1)^2(s + 3)}$$

39) Using the Laplace transform, find a solution of the initial value problem:

$$y'' - 4y = e^{-t}, \quad y(0) = y'(0) = 1$$

40) For $n \in \mathbb{N}$ let

$$f_n(t) = u_0(t) + 2 \sum_{k=1}^n (-1)^k u_{k\pi}(t)$$

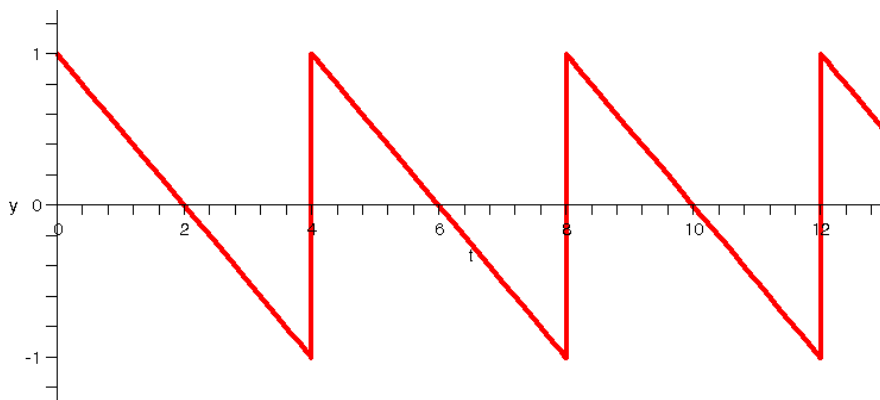
a) Sketch $f_5(t)$.

b) Determine $\mathcal{L}(f_n(t))$.

c*) For $n = 4$, determine a solution to the initial value problem

$$y'' + y = f_n(t)$$

41) Let $f(t)$ be the periodic function given by the following graph:



a) Write down an expression for $f(t)$, using Heaviside functions.

b) Calculate $\mathcal{L}(f(t))$.

Problems marked with a * are bonus problems for extra credit.