Math 3413.001: Physical Mathematics I

Homework 7, due March 12 (Thursday)

Lecture 15 (Mar 3) Due date 03/12/2020 : Section 7.5

1. Find the inverse Laplace transform $f(t)$ of $F(s) = \frac{e^{-2s}}{s-3}$, and sketch the graph of $f(t)$.
2. Let
$$f(t) = \begin{cases} 0 & \text{if } 0 \le t < 3; \\ 2 & \text{if } 3 \le t < 5; \\ 0 & \text{if } 5 \le t. \end{cases}$$
Sketch the graph of $f(t)$, rewrite $f(t)$ in terms of the step functions $u_a(t)$, and then find the Laplace transform of $f(t)$.
3. Let $f(t)$ be the periodic function with period 2 with $f(t) = 1$ for $0 \le t < 1$ and $f(t) = 0$ for $1 \le t < 2$. Sketch the graph of $f(t)$. Find the Laplace transform of $f(t)$.
4. Let $f(t)$ be the periodic function with period 2 with $f(t) = t$ for $0 \le t < 1$ and $f(t) = 0$ for $1 \le t < 2$. Sketch the graph of $f(t)$. Find the Laplace transform of $f(t)$.

Suggested problems from the book (DO NOT SUBMIT): Pg 482-483, #3, 8, 12, 16, 26, 28, 31