Read each problem **very carefully** before starting to solve it and do only what is asked. Each problem is worth around 5 points. It is necessary to show **all** your work. Correct answers without explanations are worth 0 points. GOOD LUCK!!

1. [6 points]

   (a) Compute from scratch $\mathcal{L}\{t\}$ (the Laplace transform of $f(t) = t$).

   (b) Let $f(t) = \begin{cases} 5, & \text{if } 0 \leq t < 1 \\ 5t, & \text{if } t \geq 1 \end{cases}$. Compute from scratch $\mathcal{L}\{f(t)\}$.

2. [6 points] Solve using Laplace Transforms the initial value problem

$$y'' + y = 5t, \quad y(0) = 0, \ y'(0) = -3.$$

In this case, you are, of course, allowed to consult your tables.