

Math 2080: Differential Equations

Worksheet 5.1: What is a Laplace transform?

NAME:

The *Laplace transform* of a function $f(t)$ is the function $F(s) := \mathcal{L}\{f(t)\}(s) = \int_0^{\infty} f(t)e^{-st} dt$.

1. Let $f(t) = \begin{cases} 1, & 3 \leq t \leq 5 \\ 0, & \text{otherwise.} \end{cases}$ Sketch a graph of $f(t)$ and compute its Laplace transform.

2. Let $f(t) = \begin{cases} t, & 0 \leq t \leq 3, \\ 3, & t > 3. \end{cases}$ Sketch a graph of $f(t)$ and compute its Laplace transform.