1. [12 points] Find each of the following.

    a. [7 points] Use the integral definition of the Laplace transform to find $F(s) = \mathcal{L}\{f(t)\}$, where

$$f(t) = \begin{cases} e^{-1}, & 0 < t \le 1 \\ e^{-t}, & 1 < t < \infty. \end{cases}$$

    b. [5 points] Give another function $g(t)$ for which $\mathcal{L}\{g(t)\} = F(s)$. Explain your answer briefly.