Quiz for April 1, 2010

The quiz is worth 5 points. **Remove EVERYTHING from your desk except this quiz and a pen or pencil. SHOW every step.** Express your work in a neat and coherent manner. $\boxed{\text{BOX}}$ your answer.

Compute the Laplace transform of the function $f(t)$ which is graphed below.

$$\mathcal{L}\left(f(t)\right) = \int_0^{\infty} e^{-\alpha t} f(t)\, dt = \int_0^1 e^{-\alpha t}\, dt$$

$$\text{since } f(t) = \begin{cases} 1 & \text{for } 0 \le t \le 1 \\ 0 & \text{for } 1 < t \end{cases}$$

$$= -\frac{1}{\alpha} e^{-\alpha t} \Big]_0^1 = \boxed{-\frac{1}{\alpha} e^{-\alpha} + \frac{1}{\alpha}}$$