Ex: Find the Laplace transforms of the following waveform:
\[ \frac{e^{-2t}}{t} \]

Sol'n: We apply the identity for "divide by \( t \)":
\[
L\left[ \frac{v(t)}{t} \right] = \int_{s}^{\infty} V(s) \, ds
\]
This translates into the following equation:
\[
L\left[ \frac{e^{-at}}{t} \right] = \int_{s}^{\infty} L\left[ e^{-at} \right] \, ds = \int_{s}^{\infty} \frac{1}{s + a} \, ds = \ln s_{s}^{\infty} = \infty - s = \infty
\]
We observe that the Laplace transform does not exist. The explanation for this result is that the function we are transforming goes to infinity at \( t = 0 \), and the area under this function is infinite near \( t = 0 \). (The function behaves like \( 1/t \) near \( t = 0 \), and the integral evaluates to \( \ln(-\infty) \) at \( t = 0 \).)