Ex: Find the Laplace transform of
\[ \int_0^t e^{-at} \, dt \]

SOL'N: We use the integral identity:
\[
\mathcal{L} \left\{ \int_0^t f(t) \, dt \right\} = \frac{F(s)}{s}
\]

From a table, we have \( F(s) \)
\[
F(s) = \mathcal{L} \left\{ e^{-at} \right\} = \frac{1}{(s + a)^2}
\]

To obtain our final answer, we need only divide by \( s \):
\[
\mathcal{L} \left\{ \int_0^t e^{-at} \, dt \right\} = \frac{1}{s(s + a)^2}
\]

NOTE: We could compute the integral first and then Laplace transform, but this would be more tedious.