1. Find the Laplace transforms of the following waveforms:
   a) \( \cos(\omega t)u\left(t - \frac{1}{\omega}\right), \quad \omega > 0 \)
   b) \( \frac{d}{dt}[e^{-at}\sin(\omega t)] \)
   c) \( f(t) = ate^{-at} \)
   d) \( \int_0^t e^{-at} \, dt \)

2. Show that the following identity is valid for \( a > 0 \):
   \[
   \mathcal{L}\{f(at)\} = \frac{1}{a} F\left(\frac{s}{a}\right)
   \]

3. Find the inverse Laplace transform for each of the following expressions:
   a) \( F(s) = \frac{4s + 11}{s^2 + 3s + 2} \)
   b) \( F(s) = \frac{2s^2 - 26}{s^2 + 10s + 169} \)
   c) \( F(s) = -\frac{3s^2 + 3}{s^4} \)
   d) \( F(s) = \frac{9s^2 + 35s + 49}{(s + 2)(s^2 + 2s + 5)} \)

4. Find the inverse Laplace transform of \( \frac{1}{(s + a)^n} \).