1. (4) Using pencil and paper (Maple can be used for intermediate calculations) and the Laplace transform solve

\[ \frac{d^2y}{dt^2} + 3 \frac{dy}{dt} - 4y = e^t, \quad y(0) = 1, \quad y'(0) = 2. \]

2. (2) Write an analytical expression for the function whose graph is depicted below. Use the notation \( u(t) \) for the Heaviside function.

3. (4) Using pencil and paper (Maple can be used for intermediate calculations) and the Laplace transform solve

\[ \frac{d^2y}{dt^2} + \frac{dy}{dt} + y = [u(t - 2) - u(t - 3)] \sin(2\pi(t - 2)), \quad y(0) = 0, \quad y'(0) = 0. \]