HW#2

1. (Example 2.6)

Given $x(t) = u(t-1) - u(t-3)$ and $h(t) = u(t) - u(t-2)$ as depicted in Fig. 2-10.

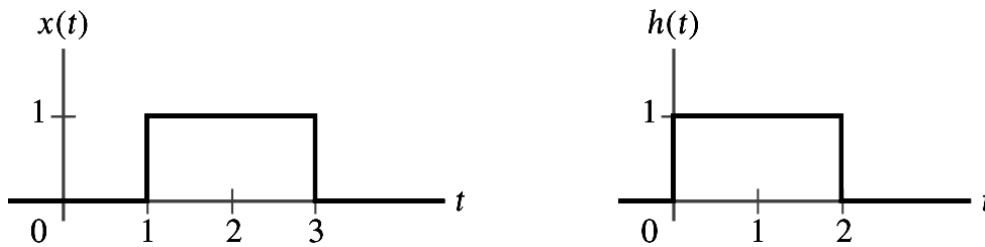Evaluate the convolution integral $y(t) = x(t) * h(t)$

Figure 2.10. Input signal and LTI system impulse response for Example 2.6.

2. (Example 2.7)

For the RC circuit in Fig. 2.12, the impulse response of this circuit is $h(t) = e^{-t} u(t)$.

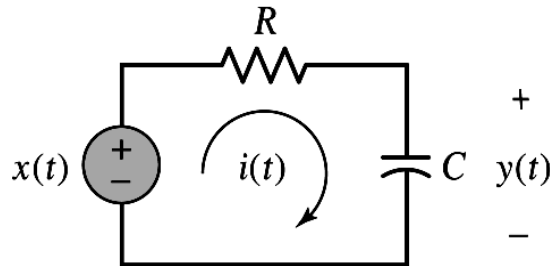Use convolution to determine the capacitor voltage, $y(t)$, resulting from an input voltage $x(t) = u(t) - u(t-2)$.

Figure 2.12. RC circuit system with the voltage source $x(t)$ as input and the voltage measured across the capacitor $y(t)$, as output.

3. (Example 2.8)

Suppose that the input $x(t)$ and impulse response $h(t)$ of an LTI system are, respectively, given by

$x(t) = (t-1)[u(t-1) - u(t-3)]$ and $h(t) = u(t+1) - 2u(t-2)$. Find the output of the system.