

# Example

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The signal  $x(t) = \sum_{n=-\infty}^{\infty} \text{rect}(t - 1/2 - 2n)$  is passed through a filter with frequency response  $H(\omega) = 3 \text{rect}(\omega/\pi)$ . Determine the output signal  $y(t)$ .

(Selected from Midterm Exam 2 of Summer 2014)

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Consider the following cascade of LTI systems:

$$x(t) \rightarrow \boxed{h_1(t)} \rightarrow \boxed{h_2(t)} \rightarrow y(t),$$

where  $h_1(t) = e^{-t}u(t)$  and  $h_2(t) = e^{-3t}u(t)$ .

- 1 Find the frequency response of the overall system.
- 2 Find the linear constant coefficient differential equation that describes this system.

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