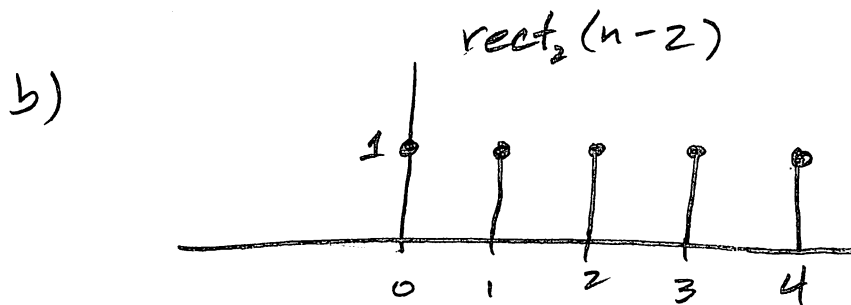


ECE 312 HW #6

(1)

a) yes. the $(u[n] - u[n-3])$ term makes $h[n] = 0 \forall n < 0$.



⊗

$$h[n] = (-0.7)^n [u[n] - u[n-3]]$$

note:

$$h[0] = 1$$

$$h[1] = -0.7$$

$$h[2] = (-0.7)^2 = 0.49$$

$$h[n] = 0 \quad \forall n \neq 0, 1, 2$$

$$y[n] = \text{rect}_2(n-2) * h[n]$$

$$y[0] = 1$$

$$y[3] = 0.79$$

$$y[1] = 0.3$$

$$y[4] = 0.79$$

$$y[2] = 0.79$$

$$y[5] = -0.21$$

$$y[6] = 0.49$$

(1)

$$c) \quad H(z) = h[0] + h[1]z^{-1} + h[2]z^{-2}$$

$$(2) \quad y[n] = x[n] - 2x[n-1]$$

$$a) \quad h[n] = \delta[n] - 2\delta[n-1]$$

$$b) \quad H(\theta) = \sum_{n=-\infty}^{\infty} h[n]e^{-jn\theta}$$

$$= \sum_{n=-\infty}^{\infty} (\delta[n] - 2\delta[n-1])e^{-jn\theta}$$

$$= 1 - 2e^{-j\theta}$$

3)

$$H(\theta) = 1 - 2e^{-j\theta} + \frac{1}{2}e^{-j4\theta}$$