MASSACHUSETTS INSTITUTE OF TECHNOLOGY
Department of Electrical Engineering and Computer Science

6.003: Signals and Systems — Spring 2004

Tutorial 2 Solutions

Tuesday, February 17, 2004

Problem 2.1

(a) $y[n] = \begin{cases} -\frac{3}{15} & n = 4k \\ -\frac{3}{30} & n = 4k+1 \\ \frac{3}{15} & n = 4k+2 \\ \frac{3}{30} & n = 4k+3 \end{cases}$

(b) $y[n] = \begin{cases} \frac{n}{2}+1 & n \geq 0, even \\ \frac{n+1}{2} & n \geq 0, odd \\ 0 & n < 0 \end{cases}$

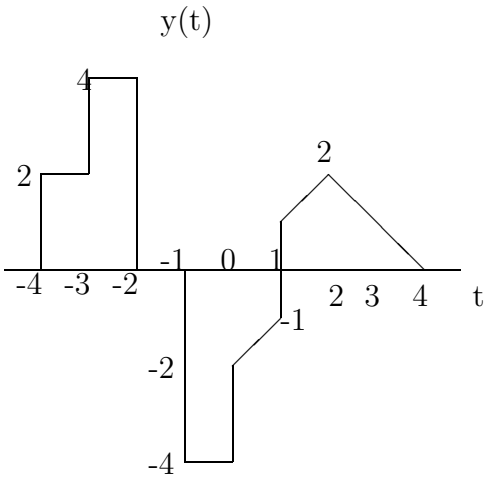
(c) $y[n] = \begin{cases} 0 & n < -5 \\ 1 & n = -5 \\ 3 & n = -4 \\ 1 & n = -3 \\ 2 & n = -2 \\ 5 & n = -1 \\ -5 & n = 0 \\ 2 & n = 1 \\ 3 & n = 2 \\ -5 & n = 3 \\ -2 & n = 4 \\ 0 & n > 4 \end{cases}$

Problem 2.2

(a) $y(t) = (t-1)u(t-1)$

(b) $y(t) = \begin{cases} 3 & t < 0 \\ 3-t & 0 < t < 3 \\ 0 & t > 3 \end{cases}$

(c) $y(t)$ as given below:



Problem 2.3

(a) $h[n] = 2\delta[n] + 3\delta[n-1] + 4\delta[n-2]$

(b) $h[n] = u[n]$

(c) $h(t) = u(t-7)$

Problem 2.5

(a) causal, unstable

(b) not causal, unstable

(c) not causal, stable

(d) not causal, unstable

(e) not causal, stable