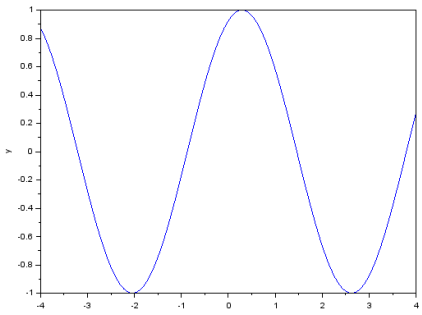
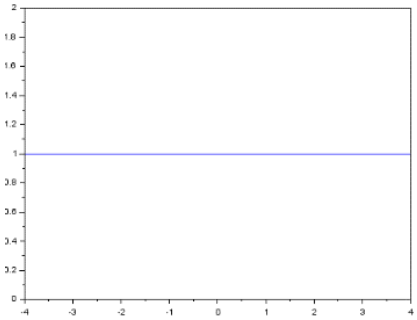
Jake T. Manlupig
BS CpE 5

Activity 2
DISCRETE-TIME SIGNALS AND SYSTEMS, PART 1

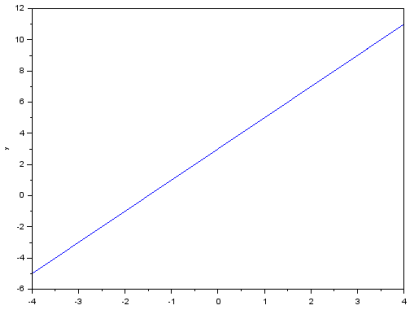
1. a) Yes, it is periodic with period 14.



b) No, it is not periodic.

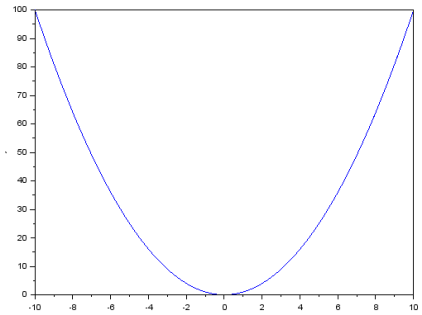


2. x(n) = -2δ (n + 3) -δ(n) + 3δ (n -1) + 2δ (n -3)
3. a) It is shift-invariant.



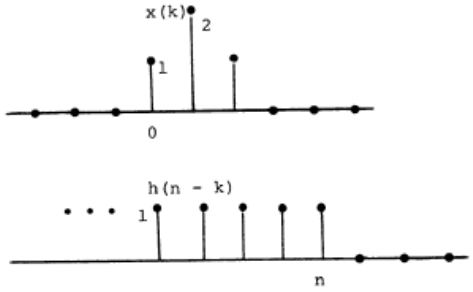
b) It is linear. Can't be graphed.

c) It is shift-invariant.

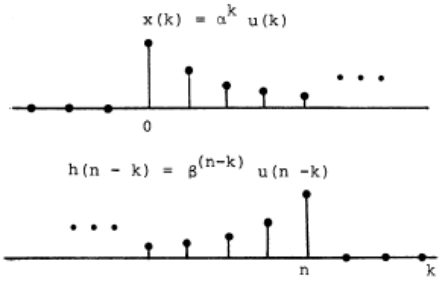


d) It is linear. Can't be graphed.

4. a) Evaluate the convolution sum

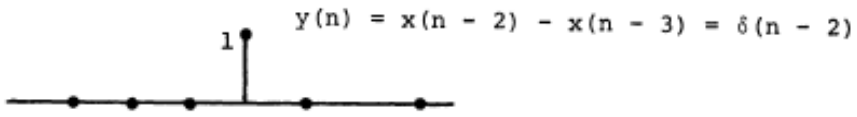


b)



c)

d)



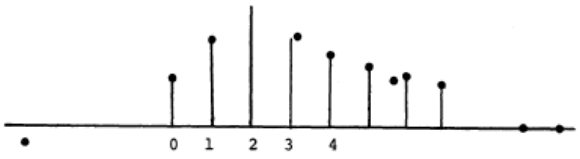
5.

a) For $n < 0$ $h_2(k)$ w $(n - k) = 0$

For $n = 0$ $y(n) = 1$

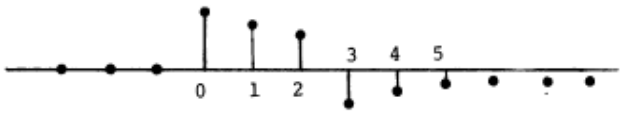
For $n = 1$ $y(n) = 1 + (.8)$

For $n > 2$ $y(n) = (.8)^{n-2} + (.8)^{n-1} + (.8)^n$



b) The convolution of h1 (n) and h_2 (n) is:

h(n) = h1 (n) * h2 (n) = (.8) ^n u(n) -(.8) ^ (n-3) u (n -3)



c) y(n) = 0 n < 0

y(0) = 1

y(l) = 1 + .8

y(2) = 1 + (.8) + (.8)2

y(3) = 1 + .8 + (.8)^2 + (.8)^3 -1 = .8 + (.8)^2 + (.8)^3

y(4) = 1 + .8 + (.8)^2 + [(.8)^3 -1] + L.8)^4 -.8]

= (.8)^2 + (.8)^3 + (.8)4

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6.