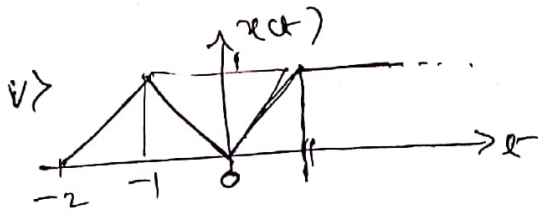


① Determine even and odd components of .

i) $x(t) = 1 + \tan t + t^2 \tan 2t$ ii) $x(n) = n^2 \left(\frac{1}{2}\right)^{n-2}$

iii) $x(t) = A \cos(t)$, $0 < t < 2$

iv) $x(n) = 1$ $0 \leq n \leq 3$
 $= -1$ $4 \leq n \leq 6$



② Determine following signals are energy @ power
determine power (average) P & Energy E in each case.

i) $x(t) = A$, $-\frac{T}{2} < t < \frac{T}{2}$
 $= 0$ o.w.

iii) $x(n) = \left(\frac{1}{4}\right)^n u(n)$

iv) $x(n) = u(n)$

ii) $x(t) = \text{rect}\left[\frac{t}{T_0}\right] \cos \omega_0 t$

③ Find and sketch the following signals and their derivatives.

i) $x(t) = u(t) - u(t-a)$, $a > 0$

ii) $x(t) = t(u(t) - u(t-a))$, $a > 0$

iii) $x(t) = u(t+3) + 2u(t+1) - 2u(t-1) + u(t-3)$

④ If $x(n) = (8-n)\{u(n) - u(n-8)\}$

Find and sketch i) $y_1(n) = x(4-n)$

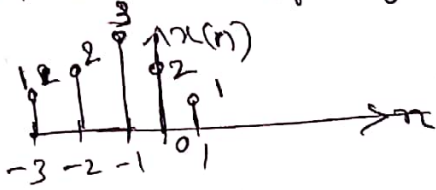
ii) $y_2(n) = x[2n-3]$

- ⑤ Check whether the signals are periodic or not & find fundamental period if periodic

$$x(t) = [\cos(2\pi t)]^2$$

$$x(n) = \cos(20\pi n) + \sin(30\pi n)$$

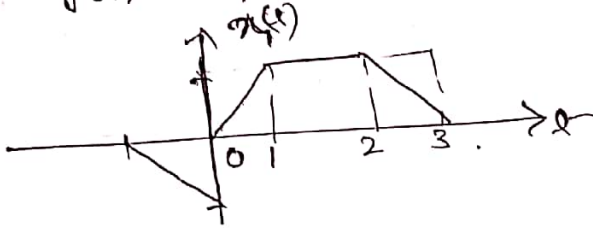
- ⑥ Find energy of the signal $x(2n-1)$



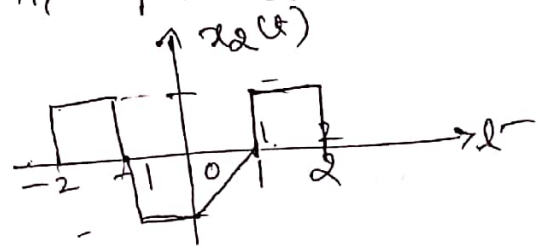
- ⑦ Find whether signals are periodic or not
i) $x(n) = \cos\left(\frac{n\pi}{8}\right) \sin\left(\frac{n\pi}{4}\right)$

- ⑧ Sketch the signals

i) $y(t) = x_1(t) \cdot x_2(t-1)$



ii) $x_1(t) \cdot x_2(-t-1)$

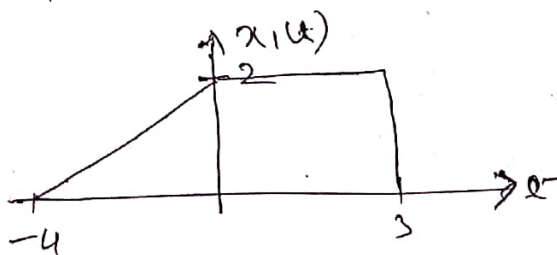


iii) $y(n) = \{1 \ 1 \ 1 \ 1 \ \frac{1}{2}\} \cdot x(2-n)$

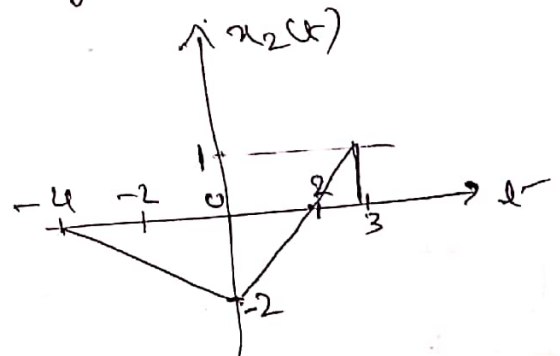
iii) $y(n)$ & $x(n) = \begin{cases} -(n+8) & -8 < n < -3 \\ 6 & n = -3 \\ -6 & -3 < n < 0 \\ n & -1 < n < 7 \\ 0 & \text{otherwise} \end{cases}$

$$y(n) = 3x\left[\frac{n}{2} + 1\right]$$

iv) $y_1(t) = x_1(t) + x_2(t)$

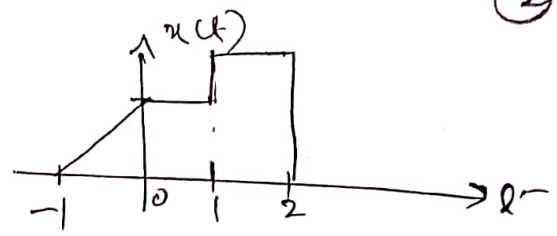


& $y_2(t) = x_1(t) \cdot x_2(t)$

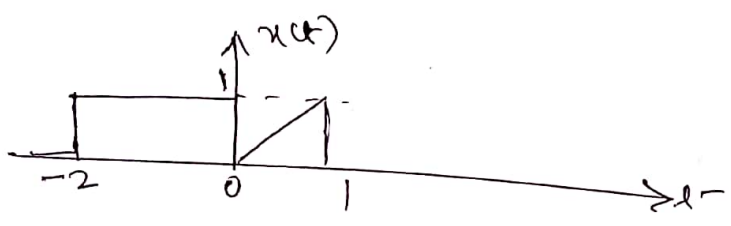


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- 9) Sketch
- i) $x(t)u(1-t)$
 - ii) $x(t)[u(t)-u(t-1)]$
 - iii) $x(t)[u(t+1)-u(t)]$
 - iv) $x(t)\delta(t-3/2)$



- 10) Sketch $x(-2t+2)$, $x(-2t-2)$ & $x(2t)$.



- 11) Find whether each of the signals are periodic or not. If periodic find fundamental period.

- i) $10 \sin(2n)$
- ii) $15 \cos(0.2\pi n)$
- iii) $5 \sin(6\pi/35)$
- iv) $(-1)^n$
- v) $\cos[\pi/8 n^2]$

If $x(n) = \{1, 2, 3, 4, 5, 6, 7\}$ find $x(2n-3)$ and $x(-2n+1)$

- 12) Express $x(t)$ in terms of $g(t)$

