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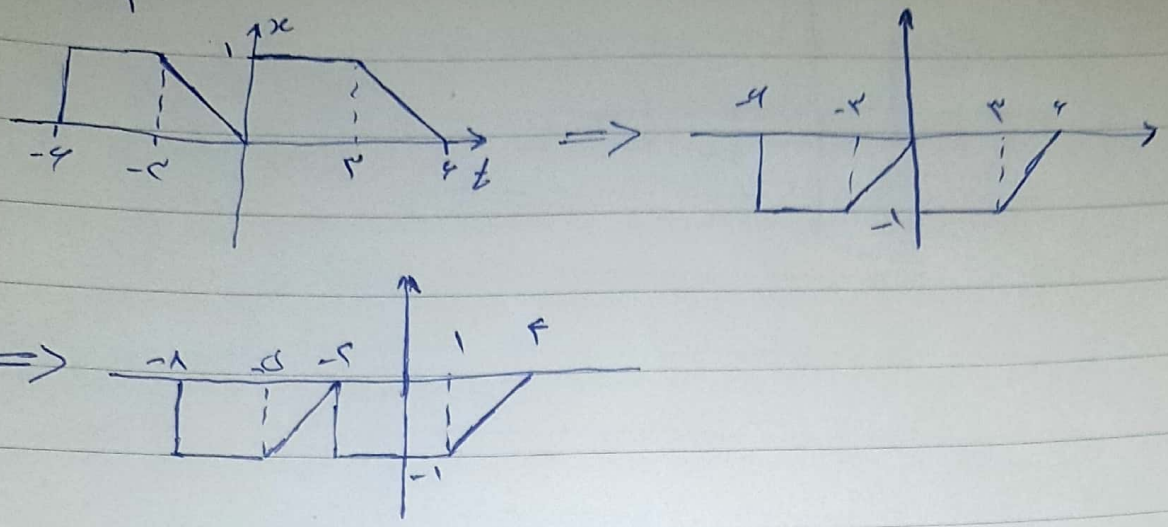
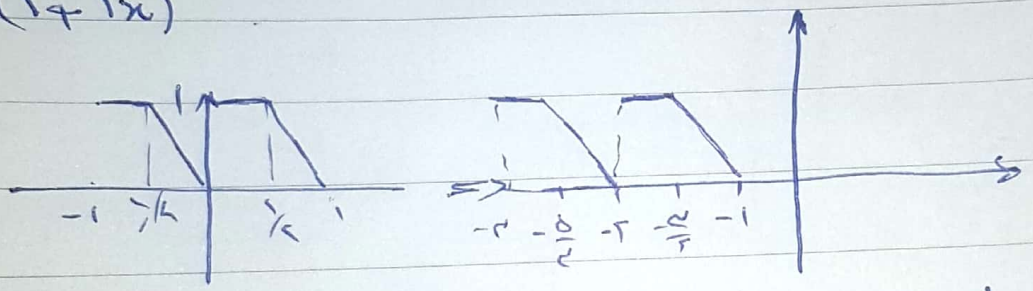
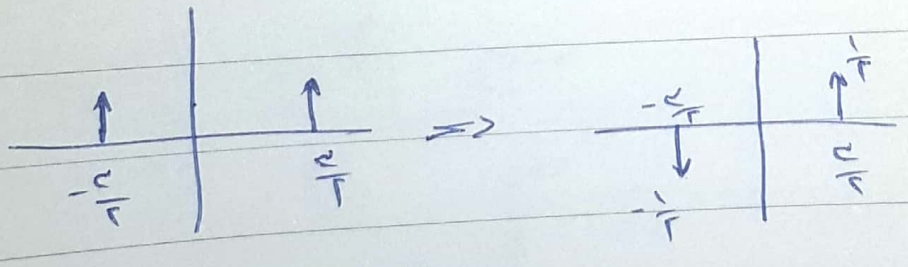
1) $x(2-\frac{t}{3})$ ①



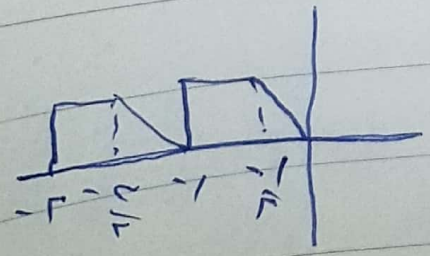
2) $x(2+2x)$



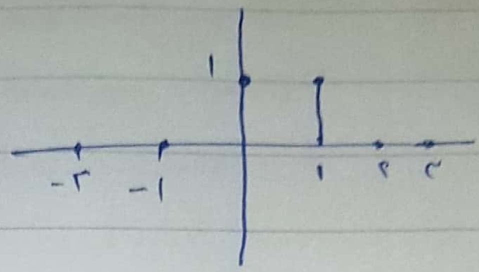
3) $x(t)\delta(t+\frac{3}{2})+x(t)\delta(t-\frac{3}{2})+x(-\frac{3}{2})\delta(t+\frac{3}{2})+x(\frac{3}{2})\delta(t-\frac{3}{2})$



4) $x(2t+1)u(t-\frac{1}{2})$



1) $x[3n]$



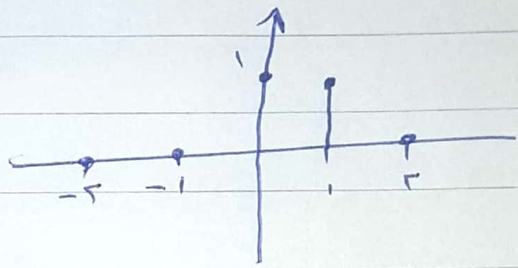
$n=0 \Rightarrow x[0]=1$

$n=1 \Rightarrow x[3]=1$

$n=2 \Rightarrow x[6]=0$

$n=-1 \Rightarrow x[-3]=0$

2) $x[n-3]$

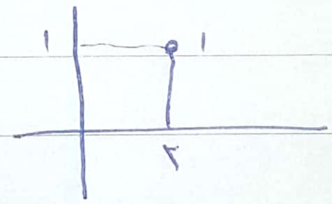


$n=-1 \Rightarrow x[-4]=0$

$n=1 \Rightarrow x[3]=1$

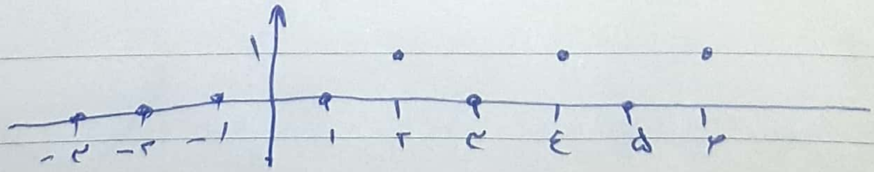
$n=0 \Rightarrow x[0]=1$

$n=2 \Rightarrow x[6]=0$



3) $x[n-2]\delta[n-2]$

4) $x[\frac{n}{2}] = \begin{cases} x[\frac{n}{2}] & \text{زوج} \\ 0 & \text{فرد} \end{cases}$



5) $x[(n-1)^2]$

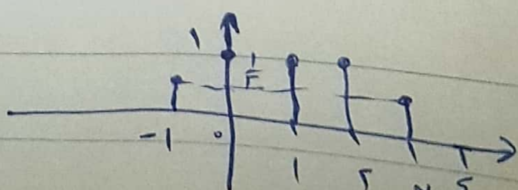
$n=-1 \Rightarrow x[4]=+\frac{1}{2}$

$n=0 \Rightarrow x[1]=1$

$n=1 \Rightarrow x[0]=1$

$n=3 \Rightarrow x[4]=\frac{1}{2}$

$n=2 \Rightarrow x[1]=1$



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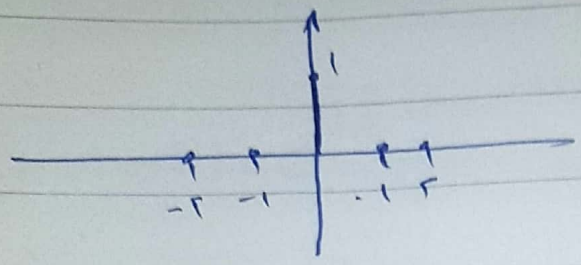
$E\{x(t)\} = \frac{x(t)+x(-t)}{2}$

$n=0 \Rightarrow x(0)=1$

$n=1 \Rightarrow x(1)=1 \quad x(-1)=-1 \quad E=0$

$n=2 \Rightarrow x(2)=1 \quad x(-2)=-1 \quad E=0$

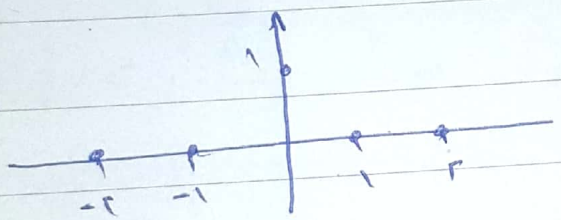
$od\{x(t)\} = \frac{x(t)-x(-t)}{2}$



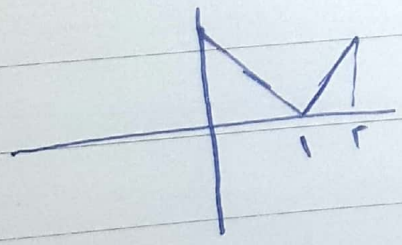
$n=0 \Rightarrow x(0)=1$

$n=1 \Rightarrow x(1)=1 \quad x(-1)=-1 \quad od=1$

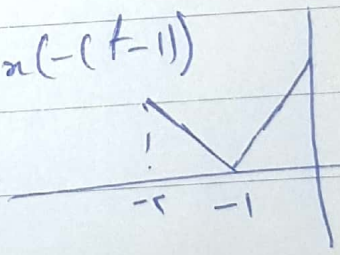
$n=2 \Rightarrow x(2)=1 \quad x(-2)=-1 \quad od=1$



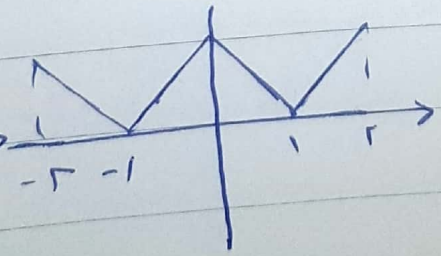
$x(t-1)$



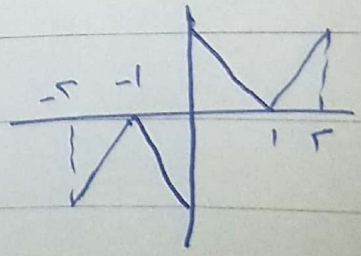
$x(-(t-1))$



زوج $\Rightarrow$



فرد



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b) $x(t) = \cos(\pi j t + 1) \Rightarrow x(t+T) = \cos((\pi j t + \pi j T) + 1)$ (۴

$T = \frac{2\pi}{\pi j}$

a) $x(T+t) = e^{(-j+1)(t+T)} = e^{t(-j+1)+T(-j+1)} \Rightarrow T = \frac{2\pi}{(-j+1)}$

3

c) $x(t+T) = \left[\cos((2t+2T) - \frac{\pi}{2})\right]^2 \qquad T = \frac{2\pi}{2}$

d) $x(n+N) = e^{-j\frac{\pi}{2}(n+N)} + e^{j\frac{2\pi}{2}(n+N)} = e^{-(N+n)} + e^{f(n+N)}$

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پریودیک نیست

f)

9

g) $x[n+N] = e^{(j\frac{n}{8} + \frac{Nj}{8}) + 0,1}$

h) $x[n+N] = e^{(j\frac{\pi n}{8} + \frac{Nj\pi}{8}) + 0,1}$

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$N = 16$

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(۴

$$x(t) = \begin{cases} re^{j(t+\tau)-t} & t \geq 0 \\ 0 & t < 0 \end{cases}$$

$$E = \int_0^\infty |re^{\tau j + t(j-1)}|^2 dt = \infty \qquad P_\infty = \frac{E_\infty}{\tau t} = 1$$

$$x[n] = \begin{cases} \left(\frac{1}{\tau} + j\frac{\sqrt{\tau}}{\tau}\right)^n & n \geq 0 \\ 0 & n < 0 \end{cases}$$

$$E = \sum_0^{n=1} \left|\left(\frac{1}{\tau} + j\frac{\sqrt{\tau}}{\tau}\right)^n\right|^\tau = 1 + \frac{1}{\tau} + j\frac{\sqrt{\tau}}{\tau} = \frac{\varepsilon}{\tau} + j\frac{\sqrt{\tau}}{\tau}$$

$$P = \frac{1}{\tau^{N+1}} \sum_0^{\frac{1}{\tau}} \left|\left(\frac{1}{\tau} + j\frac{\sqrt{\tau}}{\tau}\right)^n\right| = \left(1 + \frac{1}{\tau} + j\frac{\sqrt{\tau}}{\tau}\right) \frac{1}{\tau^{N+1}}$$

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a) $\delta[n^2-n] = \delta[n(n-1)] = \delta[n] + \delta[n-1]$

b) $u[-2n-1] \xrightarrow{u[n]=u[kn]} u[-n-1]$

c) $\sum_{n=2}^{5} \sin\frac{\pi}{4}n \times \delta[n-1] = 0$

d) $\sum_{k=2}^{\infty} \delta[n+1-k] = \delta[n-2] + \delta[n-3] + \dots = u[n-2]$

e) $\int_{t-3}^{t} \omega^2 \delta(2\omega-4)\,d\omega = \frac{9}{2}[u(t-2) - u(t-4)]$