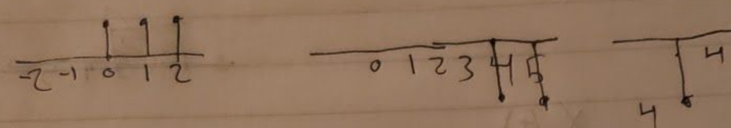
Hw4

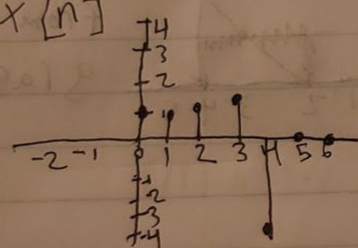
4.2

$$x[n] = u[n] - u[n-4] - 4\delta[n-4]$$

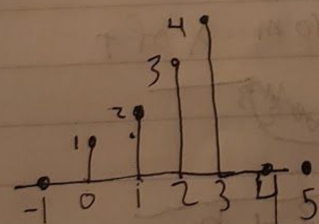
a. $u[n]$ $\quad - u[n-4]$ $\quad -4\delta[n-4]$



$x[n]$

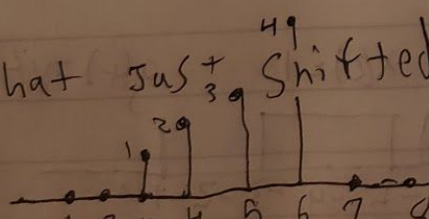


b.



from $x[n]$

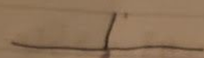
c. that just shifted 3 right



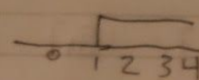
4.3

a.)

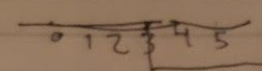
$\delta(t)$



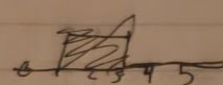
$u(t-1)$



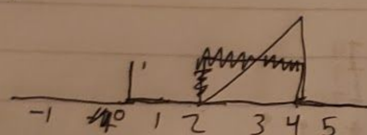
$-u[t-3]$



$u(t-1) - u[t-3]$



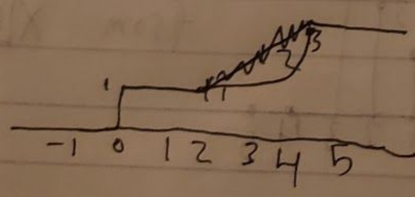
$x(t)$



from component graphs

b.)

$g(t)$ from x of t

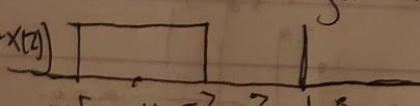


c

$x(2) = 1$

$g(t) = x(-t+1)$ flipped and right shifted

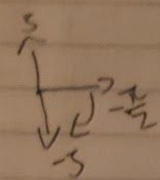
$x(-t + x(2))$



Q4.4 a $-j^5$ $5\%4=1$ $-j^5 = -j^1 = e^{-0.5\pi}$

$r = \sqrt{(-j)^2} = 1$

~~[illegible]~~ $\theta =$



True

b.) 2

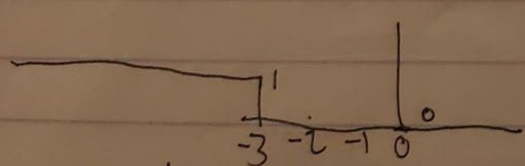
$r(t) = 1 + \cos(0.25\pi) + \sin(0.25)$

$r(T) = \cos(0\pi T) + \cos(0.25\pi t) + j\sin(0.25\pi t)$

$r(T) = 1 \cdot e^{0\pi t} + 1 \cdot e^{(j0.25\pi t)}$

c.) $f(t+3) = u(t)$

u(t) flipted and right shifted 3



d.) yes because p[0] is a constant multiple

4.5

1).

$$x(t) \xrightarrow{S_1} y(t) = x(t) \cdot x(0)$$

$$x_1 = (2) \rightarrow 2\,x_1(t)$$
$$x_2 = (-1) \rightarrow -x_2(t)$$
$$x_3(t) = 2 \cdot x(t) = 3$$
$$x_3(t) = 6$$

$$z = x_1 + x_2 = 1 \xrightarrow{S_1} z_1(t) = 1$$

$$z_1 \neq x_3(t)$$

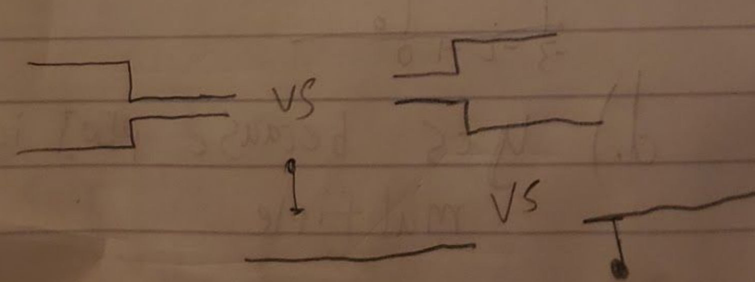
2.)

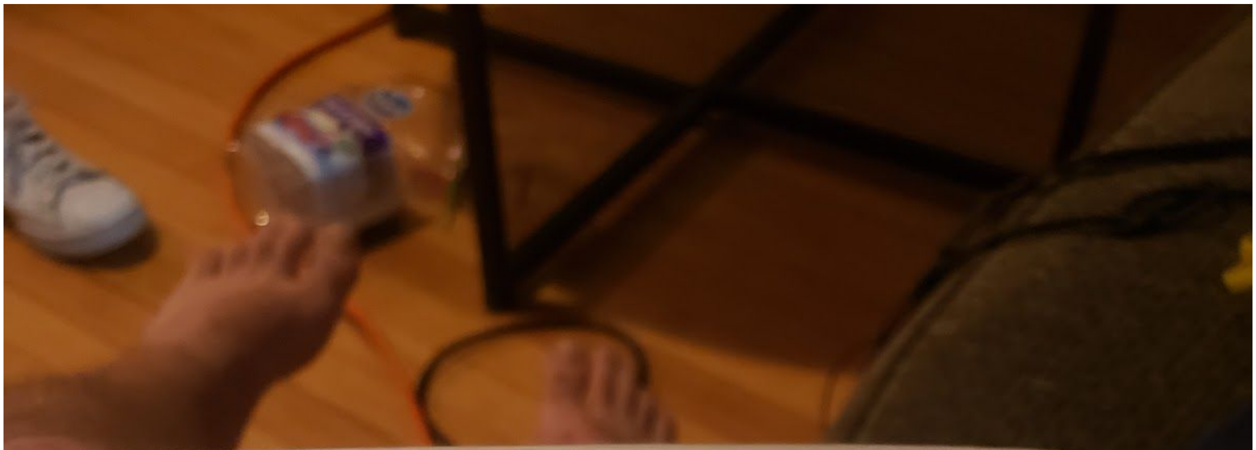
$$x(t) \xrightarrow{S_2} y(t)\ x(t) \cdot x(-t)$$

$$x_1(t) = u(t) \xrightarrow{S_2} y_1(t) = u(t) \cdot u(-t) = 0$$
$$x_2(t) = u(-t) \xrightarrow{S_2} y_2(t)\ u(-t) \cdot u(t) = 0$$

$$z_1 = x_1(t) + x_2(t) = 1$$
$$z_1 \xrightarrow{S_2} y_3(t) \cdot 1 = 1 \neq (y_1(t) + y_2(t) = 0)$$

3.)

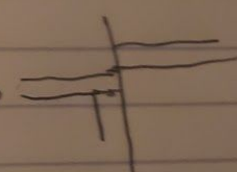




$x_1(t) = 1 \xrightarrow{S_3}$ $y_1(t) = \begin{cases} -1 & < 0 \\ 4 & \geq 0 \end{cases}$ $z_2 = \begin{cases} -\delta & < 0 \\ & > 0 \end{cases}$

$x_2(t)\ \delta(\ ) \xrightarrow{S_3}$ $y_2(t) = -\delta(t+t)$

$z(t) = 1 + \delta(t+1) \xrightarrow{S_3} y_3(t) = \begin{cases} -1 + \delta(t+1) & < 0 \\ 1 + \delta(t+1 & > 0 \end{cases} =$



$y_3(t) \neq z_2(t)$