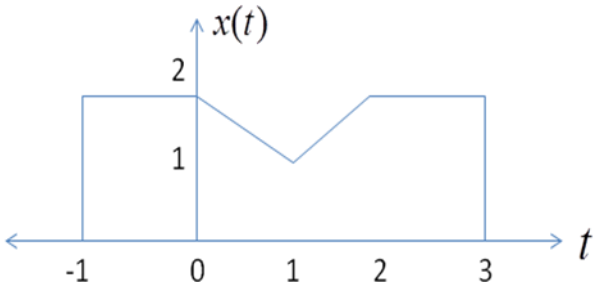
TUTORIAL-6

Q.1 For the signal $x(t)$ shown below, find



a) $X(0)$

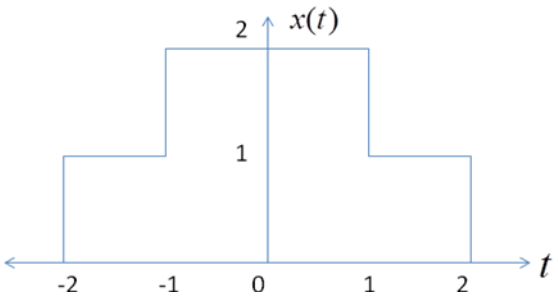
b) $\int_{-\infty}^{+\infty} X(f)df$

Q.2 Find the Fourier Transform of the following signals (using properties):

a) $x(t) = \dfrac{2a}{a^2 + t^2}$

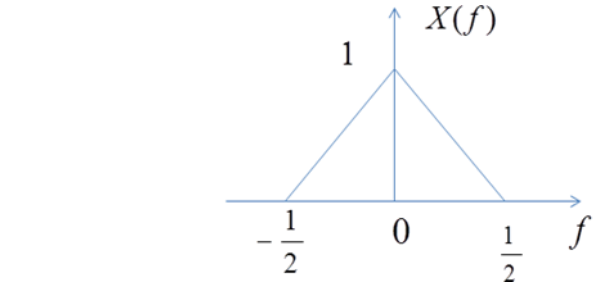
b) $x(t) = rect\left[\dfrac{(t-1)}{2}\right]$

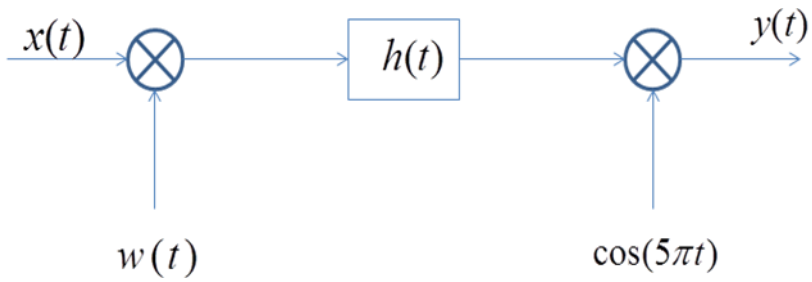
c)



Q.3 Consider the system shown below. The FT of the input signal $X(f)$ is also shown in figure.

Find the FT of the output $y(t)$ given that $w(t)=\cos(5\pi t)$ and $h(t)=\dfrac{\sin(6\pi t)}{\pi t}$.





Q.4 Given $y(t)=x(t)*h(t)$ and $g(t)=x(3t)*h(3t)$, such that $g(t)=Ay(Bt)$, What is the value of A and B?

Q.5 A causal and Stable LTI system has the frequency response

$$H(f)=\frac{j2\pi f+4}{6-(2\pi f)^2+j10\pi f}.$$

a) Find the Impulse Response.

b) What is the output when the input applied is

$$x(t)=e^{-4t}u(t)-te^{-4t}u(t).$$