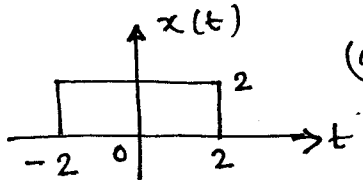
Signet Tutoria-4

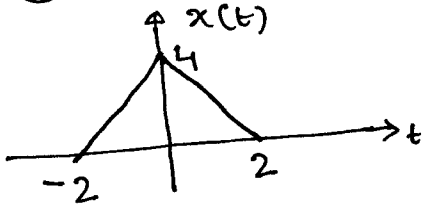
(1) 

(a) Obtain $\mathcal{F}\{x(t)\}$ ~~from~~ using basic equation of F.T. Sketch $|X(\omega)|$

(b) Sketch $\frac{dx}{dt}$ and get $\mathcal{F}\left\{\frac{dx}{dt}\right\}$ using basic equation of F.T.

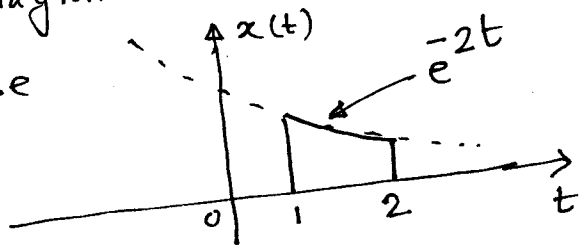
(c) Use result obtained in (b) to get $X(\omega)$. Compare the result with (a).

(2) Get the FT of the triangular pulse $x(t)$ as shown. It is better to use differentiation property to get $\mathcal{F}\{x(t)\}$.



(3) for $x(t) = e^{-at}u(t)$; a is real and +ve. Obtain $X(\omega)$ and sketch magnitude spectra.

(4) $x(t)$ is an exponential pulse as shown.



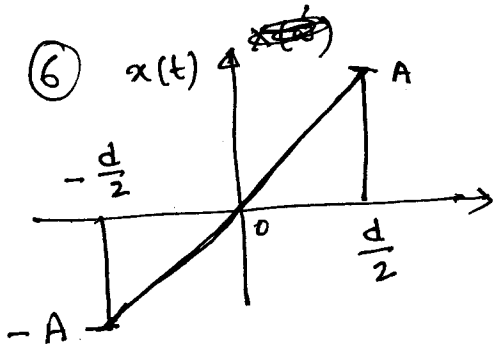
(a) Get $\mathcal{F}\{x(t)\}$ using basic equation of FT.

(b) Get $X(\omega)$ by using result of (3) and some properties of FT.

(5) Sketch $x(t) = e^{-a|t|}$ and (i) get $X(\omega)$ using basic equ^{n} of F.T

(ii) Also get $X(\omega)$ using result of (3) and some property of FT

(iii) Calculate energy associated with the signal in time domain and in frequency domain.

(6) 

Find $X(\omega)$.

(7) Find the convolution of the following signals using F.T.

(a) $x_1(t) = 2e^{-2t}u(t)$ and $x_2(t) = e^{-4t}u(t)$

(b) $x_1(t) = te^{-t}u(t)$ and $x_2(t) = e^{-2t}u(t)$.

(8) (a) If $X(\omega) = \frac{j\omega}{(j\omega+3)^2}$ then what is $x(t)$?

(b) If $X(\omega) = e^{-4\omega}u(\omega)$ then what is $x(t)$?

(9) Find the FT of the following signals.

(a) $e^{-3t}\sin 4t\, u(t)$

(b) $\delta(t+4) + \delta(t+2) + \delta(t-2) + \delta(t-4)$

(10) A system is described by

$$\frac{d^2y}{dt^2} + 7\frac{dy}{dt} + 10y = x(t)$$

Get $y(t)$ using F.T when

(a) $x(t) = \delta(t)$

(b) $x(t) = e^{-t}u(t)$

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