Q.1 Find the fourier transform of $x(t) = \sin(8t + 0.1\pi)$

Sol^n =

Let, $x_1(t) = \sin(t + 0.1\pi)$

$\therefore x_1(8t) = \sin(8t + 0.1\pi) = x(t)$

We know,

$$F(\sin t) = j\pi[\delta(\omega+1) - \delta(\omega-1)]$$

Using time shifting property [i.e.

$x(t-t_0) \xleftrightarrow{F.T} e^{-j\omega t_0} X(\omega)$] we have,

$$F[\sin(t + 0.1\pi)] = e^{j\omega(0.1\pi)} F(\sin t)$$

$$= e^{j\omega(0.1\pi)} j\pi[\delta(\omega+1) - \delta(\omega-1)]$$

Using time scaling property

[i.e. $x(at) \xleftrightarrow{F.T} \frac{1}{|a|} X(\omega/a)$], we have

$$F[\sin(8t + 0.1\pi)] = \frac{1}{|8|} F[\sin(t + 0.1\pi)]\Big|_{\omega=\omega/8}$$

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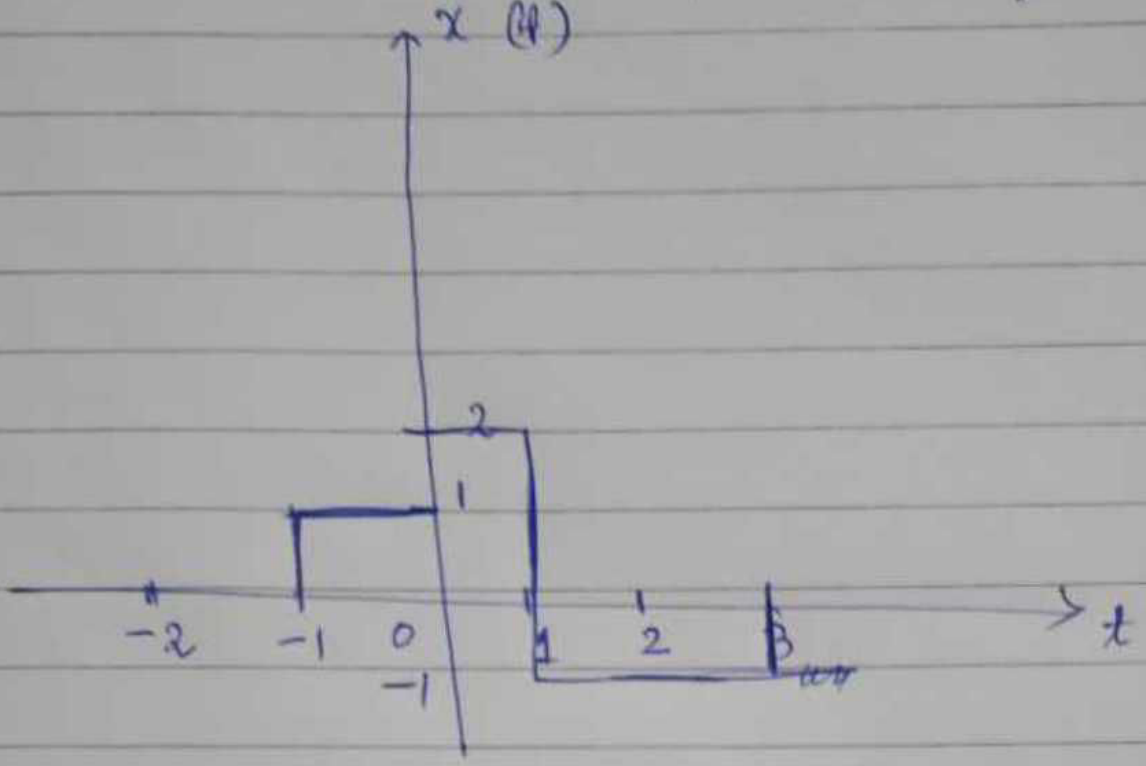
Q2. Compute the Fourier Tx for the s/g x(t)



Q3. Compute the Fourier Tx of the signal

$$x(t) = \begin{cases} 1+\cos \pi t & , |t| < 1 \\ 0 & |t| > 1 \end{cases}$$

Q4. Find the Fourier Tx of s/g $x(t) = 5\cos^2 3t$.

Q5. Find inverse Fourier Tx of $X(\omega) = e^{-4\omega} u(\omega)$