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Cool! I'am really happy

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My friends are so mad that they do not know how I have all the high quality ebook which they do not!

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so many fake sites. this is the first one which worked! Many thanks

Example 1

The Fourier transform of

$$f(t) = \begin{cases} 1 & |t| \leq 1 \\ 0 & |t| > 1 \end{cases}$$

is

$$F\{f(t)\} = \int_{-1}^1 e^{-i\omega t} dt = \begin{cases} 2 \frac{\sin \omega}{\omega} & \omega \neq 0 \\ 2 & \omega = 0 \end{cases}$$

The inverse Fourier transform is

$$\begin{aligned} \frac{1}{2\pi} \int_{-\infty}^{\infty} e^{i\omega x} \frac{\sin \omega}{\omega} d\omega &= \frac{1}{\pi} \int_0^{\infty} \cos \omega x \frac{\sin \omega}{\omega} d\omega = \\ &= \frac{1}{\pi} \int_0^{\infty} \frac{\sin(\omega(x+1))}{\omega} d\omega - \frac{1}{\pi} \int_0^{\infty} \frac{\sin(\omega(x-1))}{\omega} d\omega = \begin{cases} 1 & |x| < 1 \\ 1/2 & x = 1 \\ 0 & x > 1 \end{cases} \end{aligned}$$

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Fourier Transform Example Problems And Solutions