

# Properties of CTFT

P.124

## ⑧ Convolution Property

$$\begin{aligned} x(t) &\longleftrightarrow X(j\omega) \\ y(t) &\longleftrightarrow Y(j\omega) \end{aligned}$$

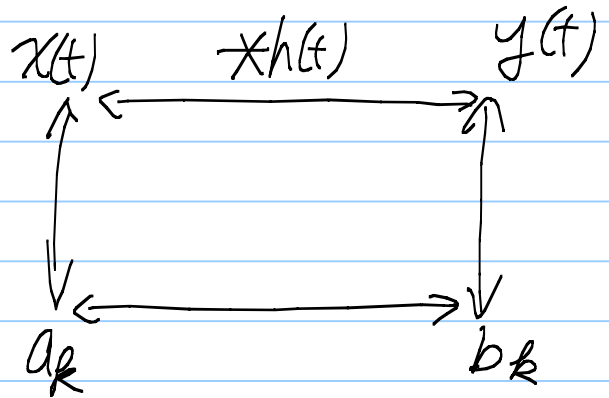
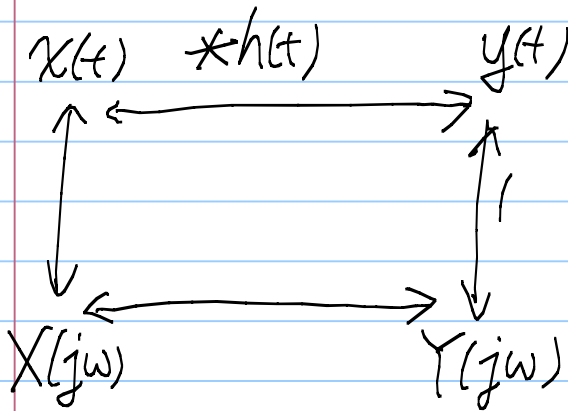
$$z(t) = x(t) * y(t) \longleftrightarrow$$

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Comparison  
aperiodic

VS.

periodic

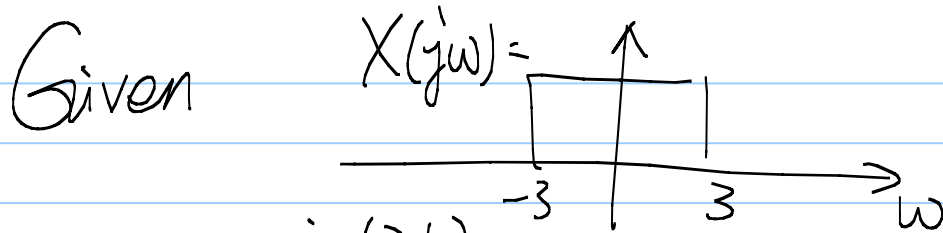


Now we have 2 methods to compute  $y(t)$

① By convolution  $y(t) = x(t) * h(t)$

② By F.T.

$$y(t) = \mathcal{F}^{-1}(X(j\omega) \cdot H(j\omega))$$



$$x(t) = \frac{\sin(3t)}{\pi t}$$

$$h(t) = \frac{\sin(3t)}{\pi t}$$

Q: Find  $y(t) = x(t) * h(t)$ .

Ans:

Q:  $h_2(t) = \frac{2\sin(2t)}{\pi t}$ , Find  $y_2(t) = X(t) * h_2(t)$

Ans: