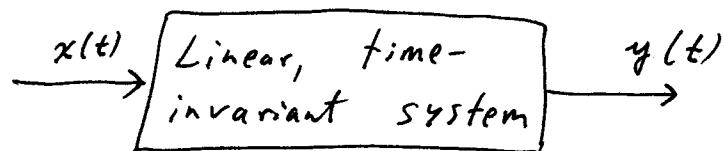


Application to Linear Systems



Impulse response $h(t)$
Frequency response $H(\omega)$

- Input $\delta(t)$, output $h(t)$.
What is spectrum of output?
 $\delta(t) \leftrightarrow 1$

- Convolution property of Fourier transform:

$$y(t) = x(t) * h(t) = \int_{-\infty}^{\infty} x(\lambda) h(t-\lambda) d\lambda$$

$$Y(\omega) = X(\omega) \cdot H(\omega)$$

$H(\omega)$ is the frequency response:

Tells amplitude gain and phase shift
at each frequency ω .