

$$X \longleftrightarrow X(s)$$

$$\frac{dx}{dt} \longleftrightarrow$$

$$Y(s)$$

$$Y(x)$$

$$\mathcal{L}\left(\frac{d^2x}{dt^2}\right) = SX(s) -$$

$$SX(0^-)$$

$$- x'(0^-)$$

$$\dot{y} + ay = u$$

$$sY(s) - y(0) + ay(s) = U(s)$$

$$Y(s+a) = \frac{U}{s+a} + \frac{y(0)}{s+a}$$

$$1 \quad u(t, x)$$

$$2 \quad \hat{u}(t, \omega) = \int_{-\infty}^{\infty} u e^{j\omega x} dx$$

$$3 \quad U(s, x) = \int_0^{\infty} u e^{-st} dt$$

$$4 \quad \hat{U}(s, \omega) = \int_0^{\infty} \hat{u} e^{-st} dt$$

$$\int_{-\infty}^{\infty} |h(t)| dt < \infty$$

$-\infty$



$$\int_{-\infty}^{\infty} |h(t)| e^{j\omega t} dt < \infty$$

$$H(j\omega)$$

ROC

$$\sigma = 0$$



