EECE 233 Fall 2014 Lec #26

Announcements

1. A supplementary class meeting on this Friday from 09:30 till 10:45

2. A re-taking midterm 2 will be held on next Monday from 14:00 till 15:15.

3. A Quiz 2. MATLAB session will be held on " Wednesday from 09:30-10:45.

Review

CT LTI System design (LPF, BPF, HPF, all-pass filter)

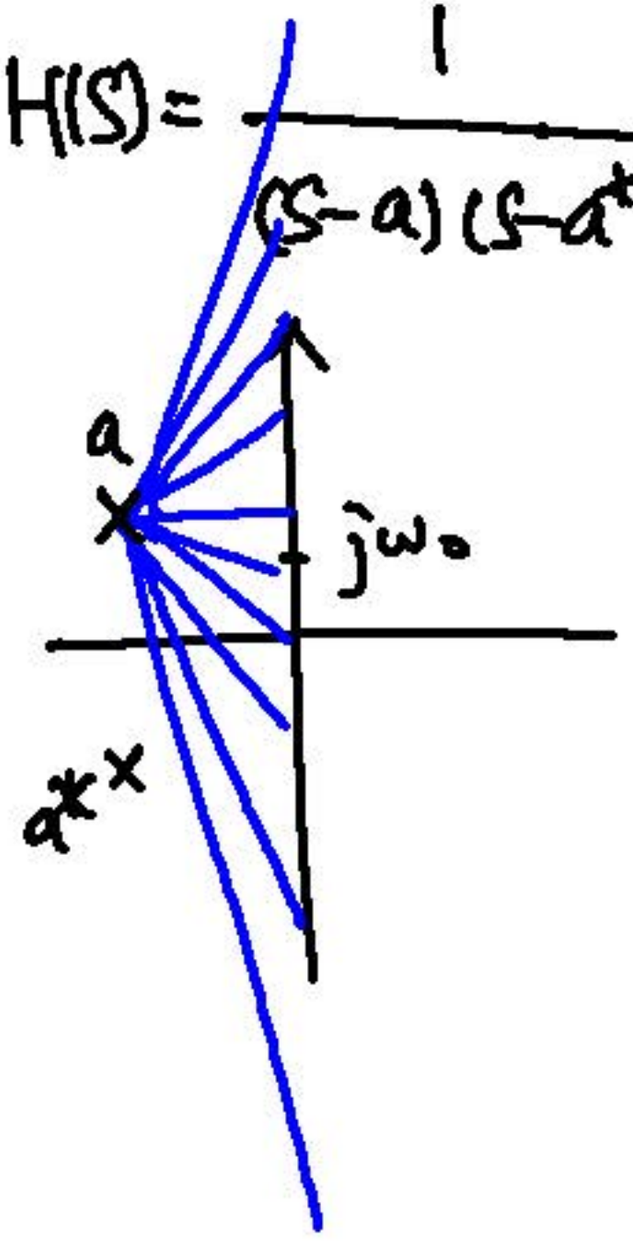
- TD: $h(t)$
- FD: $H(j\omega)$, $|H(j\omega)|$

LCCDE

$$\sum_{k=0}^{M} a_k \frac{d^k y(t)}{dt^k} = \sum_{k=0}^{N} b_k \frac{d^k x(t)}{dt^k}$$

- $\underbrace{H(s)}_{\text{s-d ft}}\Big|_{s=j\omega} = \underbrace{H(j\omega)}_{\text{w-d ft}}$

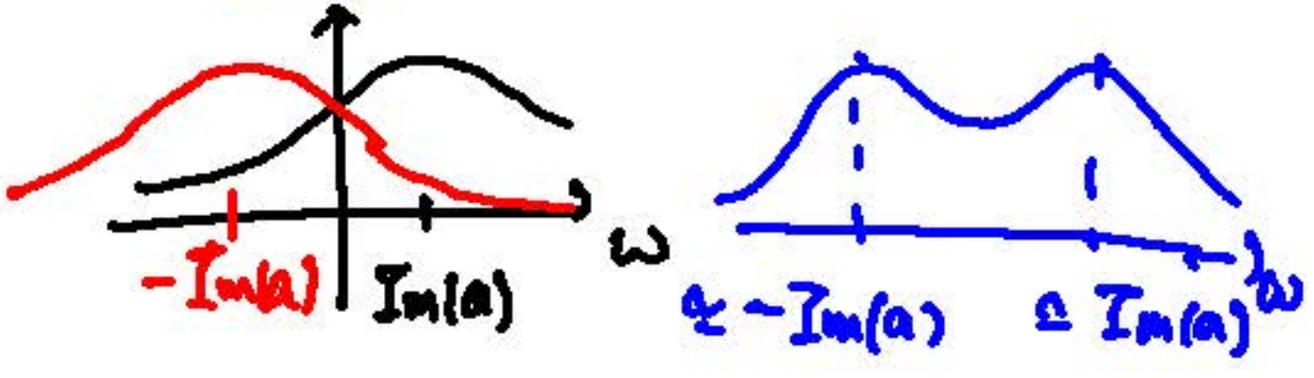
$$H(s) = \frac{1}{(s-a)(s-a^*)}$$



$$|H(j\omega)|$$

$$= |H(s)|\Big|_{s=j\omega}$$

$$= \frac{1}{|s-a|} \cdot \frac{1}{|s-a^*|}\Big|_{s=j\omega}$$



· BIBO stable

- Def. A CT system is BIBO stable

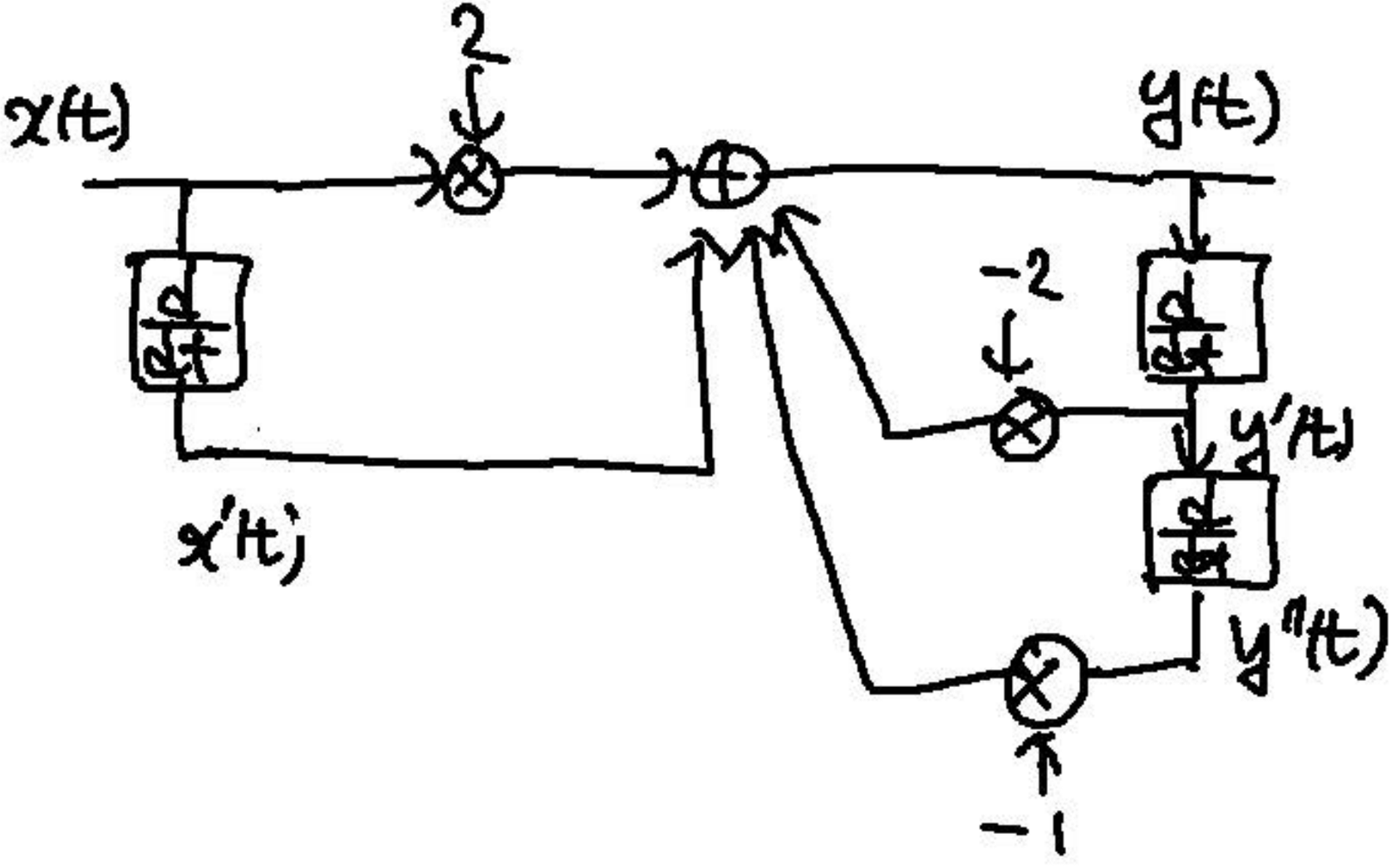
if $x(t)$ has a $M<\infty$ st. $|x(t)|<M, \forall t$.

then $\exists\ 0<N<\infty$ s.t. $|y(t)|<N, \forall t$

- Thm. A CT system w/ $h(t)$ is BIBO stable iff $\int_{-\infty}^{\infty}|h(t)|dt<\infty$.

TD

- Thm.

...

$$y''(t) + 2y'(t) + y(t) = x(t) + 2x(t) - y''(t) - 2y'(t)$$