

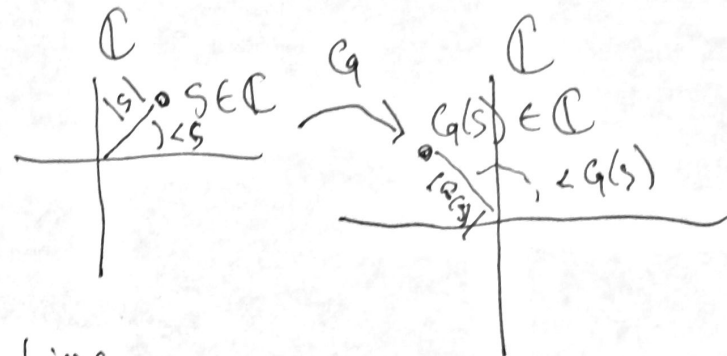
ECE 447 Thu Oct 12

today / this week:

HW 1 due tomorrow!

→ any Qs?

□ tutorial: pick up from last time



• given transfer function $G(s)$ determine $y(t)$ when $u(t) = \sin(t)$

1°. when $u = e^{st}$, $y = G(s)e^{st}$,

[we know $y(t) = \underbrace{A}_{|G(s)|} \sin(\omega t + \underbrace{\phi}_{\angle G(s)})$ if $u(t) = \sin(\omega t)$]

Q: what if $\text{Im}(s) \neq 0$? what does $u(t) = e^{st}$ mean? like, physically?

2°. $\sin(\omega t) = \frac{1}{2i} (\underbrace{e^{i\omega t}}_{u_1} - \underbrace{e^{-i\omega t}}_{-2i \cdot u_2}) \leftarrow$ Euler's formula

3°. $u(t) = \sin(\omega t) = u_1(t) + u_2(t) \leadsto y(t) = y_1(t) + y_2(t)$

where ~~y~~ $y_1 = G(i\omega)u_1$, $y_2 = G(-i\omega)u_2$

np. all close ($y(t)$) is True
↑
imaginary part of