Homework #8 林靖 108061112

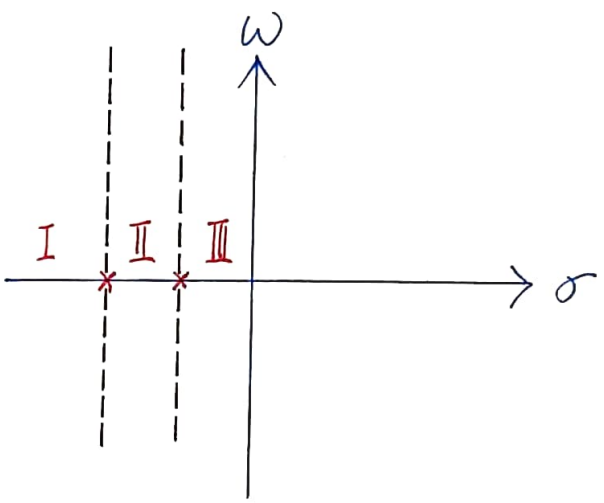
Problem 1

$$H(s) = \frac{2s+3}{s^2+3s+2}$$

$$= \frac{(s+1)+(s+2)}{(s+1)(s+2)}$$

$$= \frac{1}{s+1} + \frac{1}{s+2}$$

pole: $-1, -2$



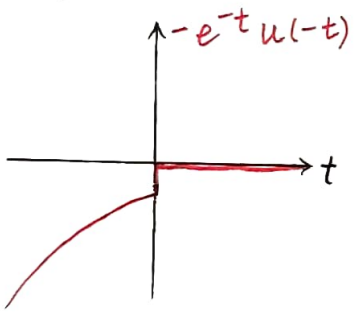
s-plane

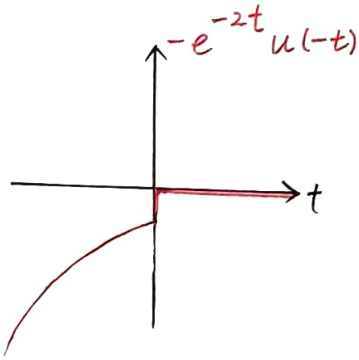
Problem 1 (continued)

region I

$\sigma < -2$

$h(t) = -e^{-1t}u(-t) - e^{-2t}u(-t)$





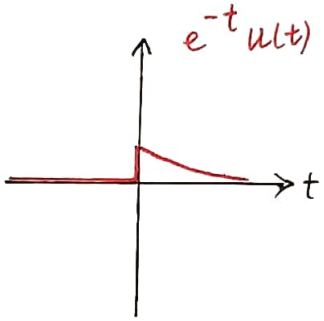
anti-causal

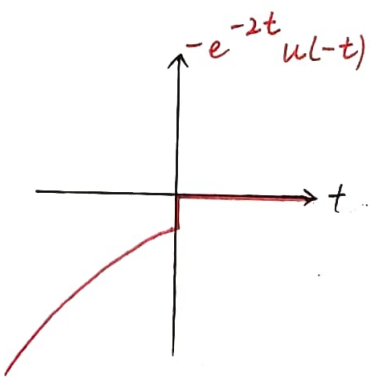
not a.i.

region II

$-2 < \sigma < -1$

$h(t) = +e^{-1t}u(t) - e^{-2t}u(-t)$





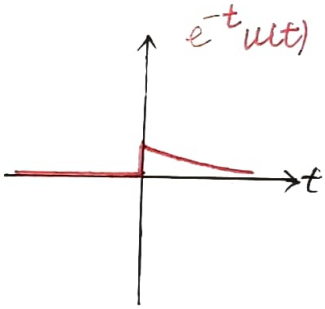
non-causal

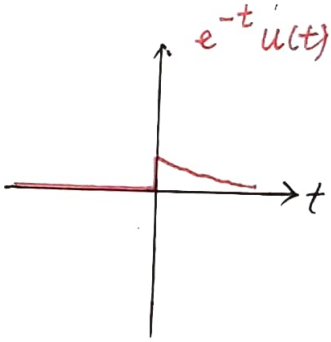
not a.i.

region III

$-1 < \sigma$

$h(t) = +e^{-1t}u(t) + e^{-2t}u(t)$





causal

a.i.

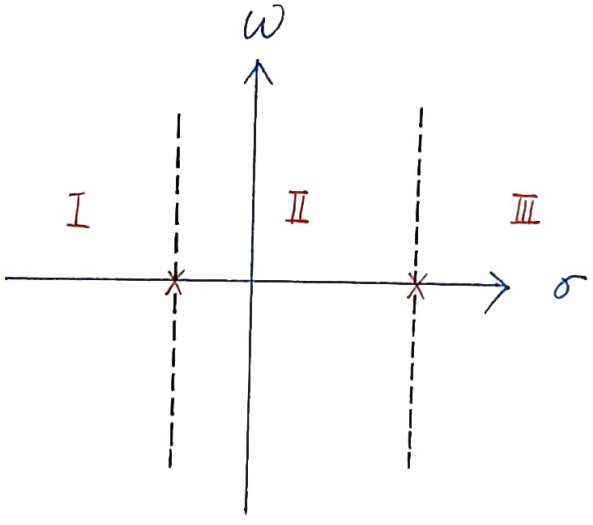
Problem 2

$$H(s) = \frac{2s-1}{s^2-s-2}$$

$$= \frac{(s-2)+(s+1)}{(s-2)(s+1)}$$

$$= \frac{1}{s-2} + \frac{1}{s+1}$$

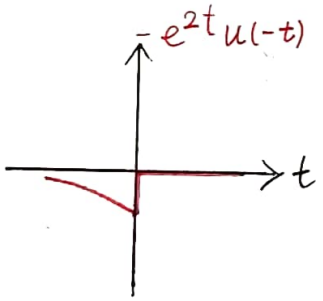
pole : $2, -1$

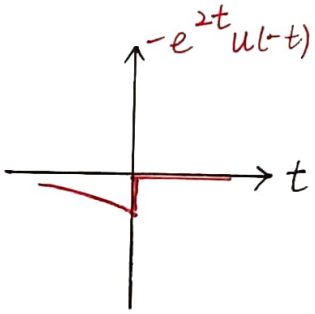


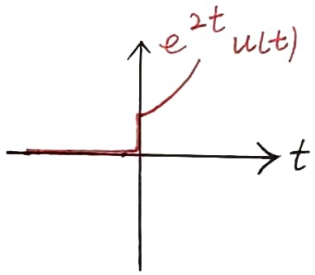
s-plane

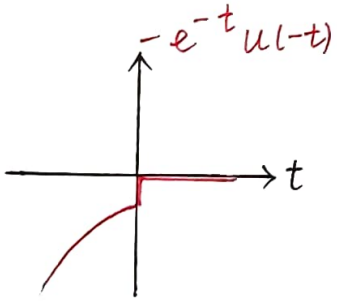
Problem 2 (continued)

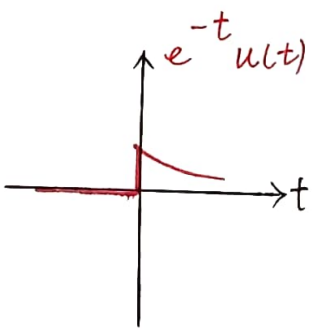
region I	region II	region III
$\sigma < -1$	$-1 < \sigma < 2$	$2 < \sigma$
$h(t) = -e^{--2t}u(-t) - e^{-1t}u(-t)$	$h(t) = -e^{--2t}u(-t) + e^{-1t}u(t)$	$h(t) = +e^{--2t}u(t) + e^{-1t}u(t)$

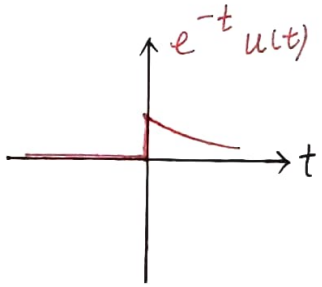












anti-causal	non-causal	causal
not a.i.	a.i.	not a.i.

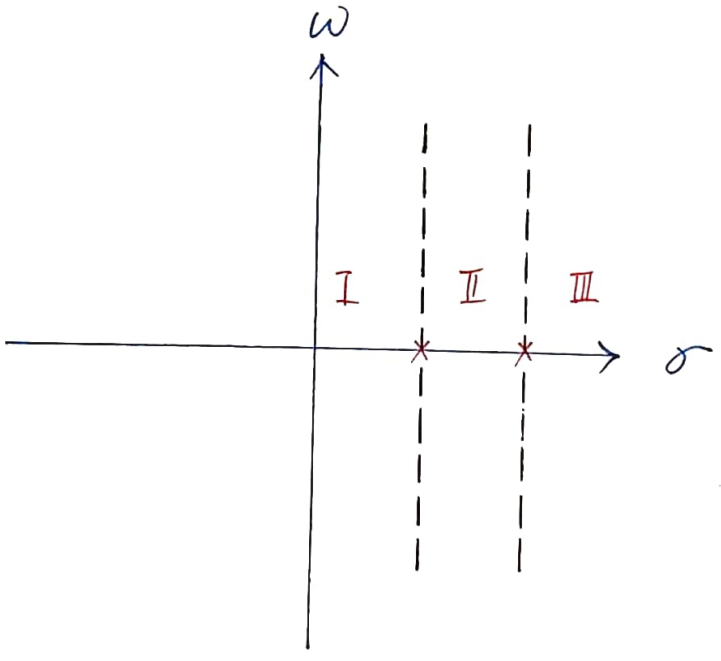
Problem 3

$$H(s) = \frac{2s-3}{s^2-3s+2}$$

$$= \frac{(s-1)+(s-2)}{(s-1)(s-2)}$$

$$= \frac{1}{s-1} + \frac{1}{s-2}$$

pole : 1 , 2



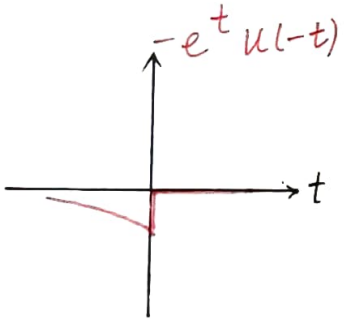
s-plane

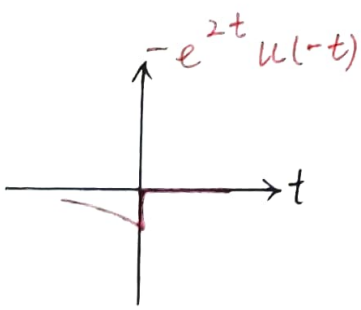
Problem 3 (continued)

region I

$\sigma < 1$

$h(t) = -e^{--1t}u(-t) - e^{--2t}u(-t)$





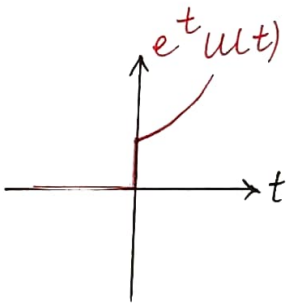
anti-causal

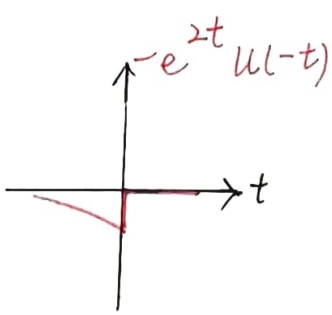
a.i.

region II

$1 < \sigma < 2$

$h(t) = +e^{--1t}u(t) - e^{--2t}u(-t)$





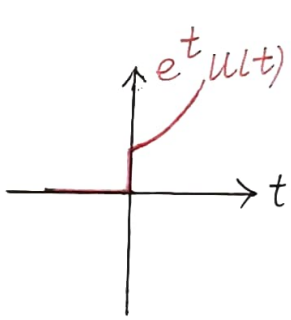
non-causal

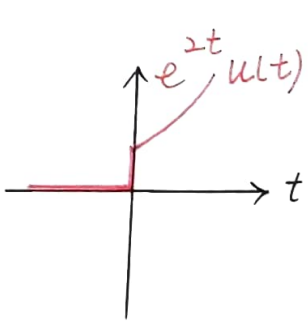
not a.i.

region III

$2 < \sigma$

$h(t) = +e^{--1t}u(t) + e^{--2t}u(t)$





causal

not a.i.

Problem 4

(1) 收斂區間在最右邊 pole 的右邊。

(2) 收斂區間包含虛軸。