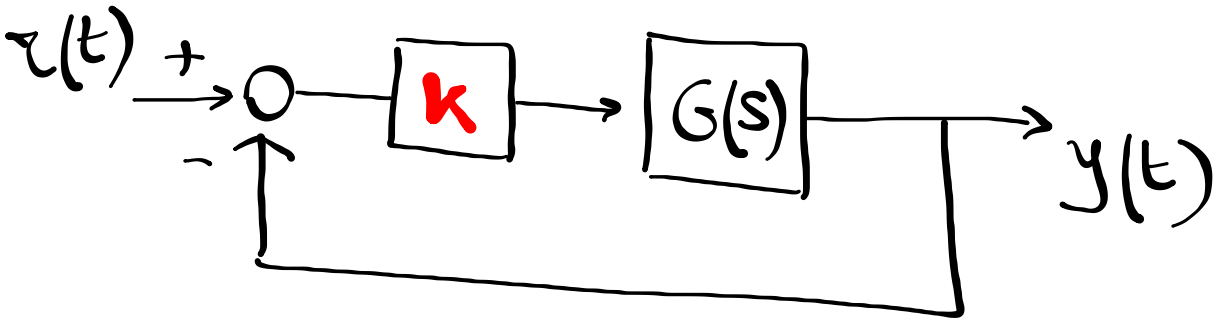
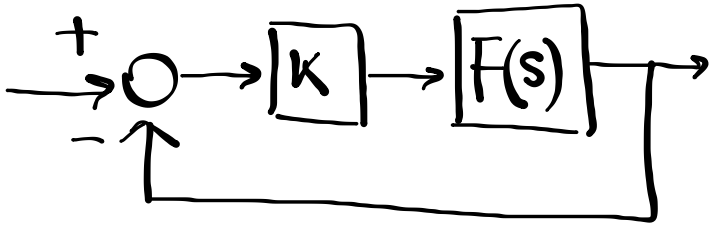
$$G(s) = \frac{1}{s(s+1)^3}$$



Determinare K tale che

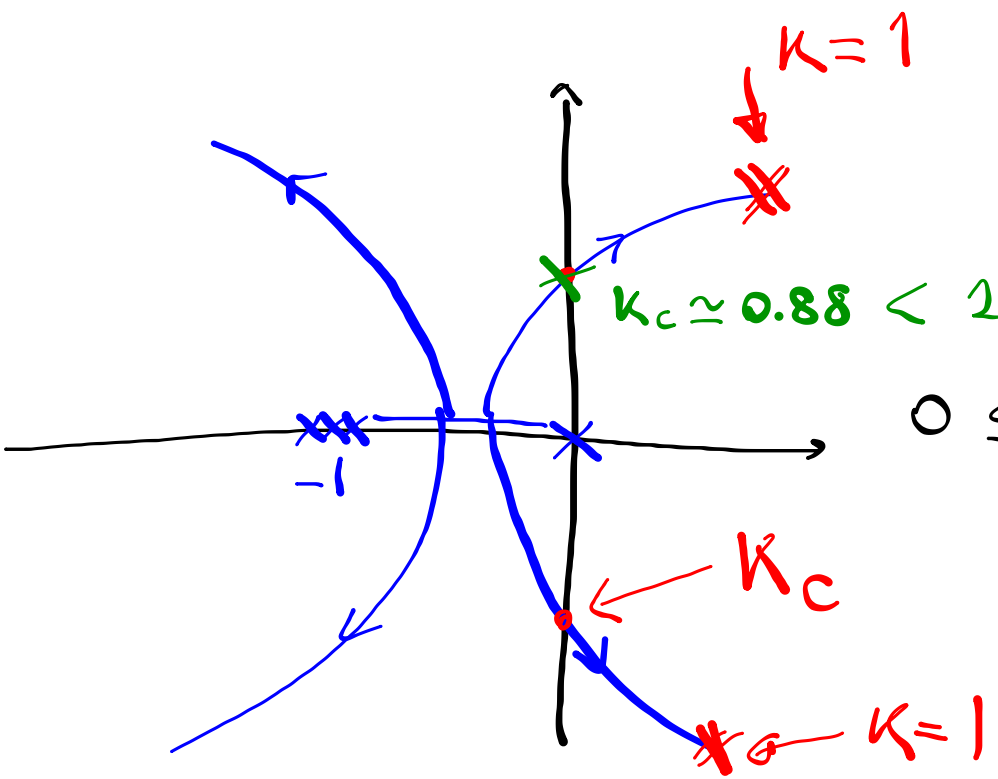
$$\begin{cases} S\% \leq 10\% \quad (\delta \geq 0.6) \\ T_a \leq 20\,s. \end{cases}$$

Luogo delle Radici



$$1 + K\,F(s) = 0$$

$$G_R(s) = \frac{K\,F(s)}{1 + K\,F(s)}$$



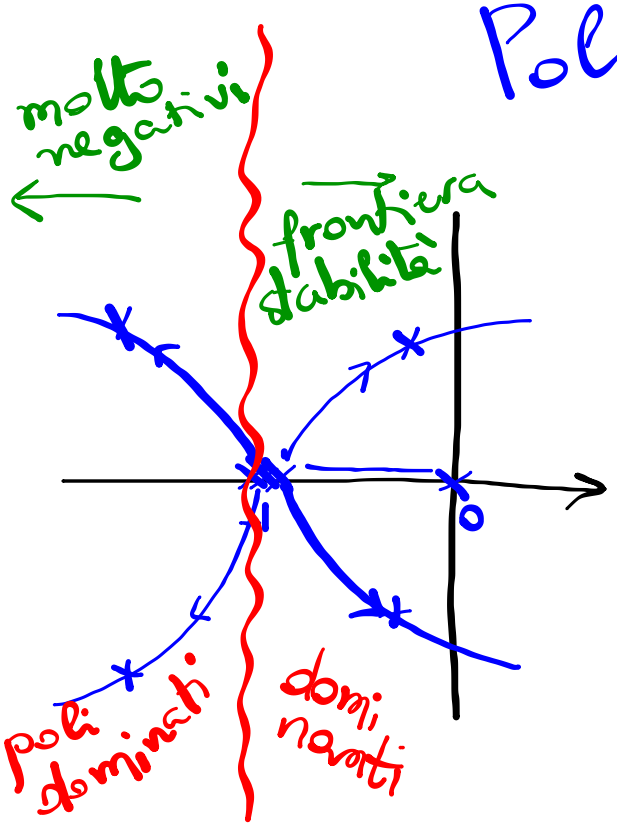
$$G(s) = \frac{1}{s(s+1)^3}$$

$$0 \leq K < +\infty$$

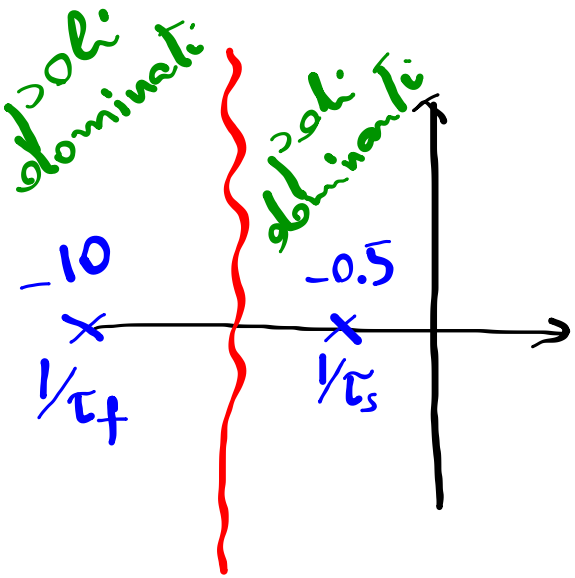
- Luogo delle radici → rlocus

- Determino il k a cui corrisponde la posizione individuata col puntatore del mouse → rlocfind
- Luoghi a δ cost → sgrid

Poli Dominanti

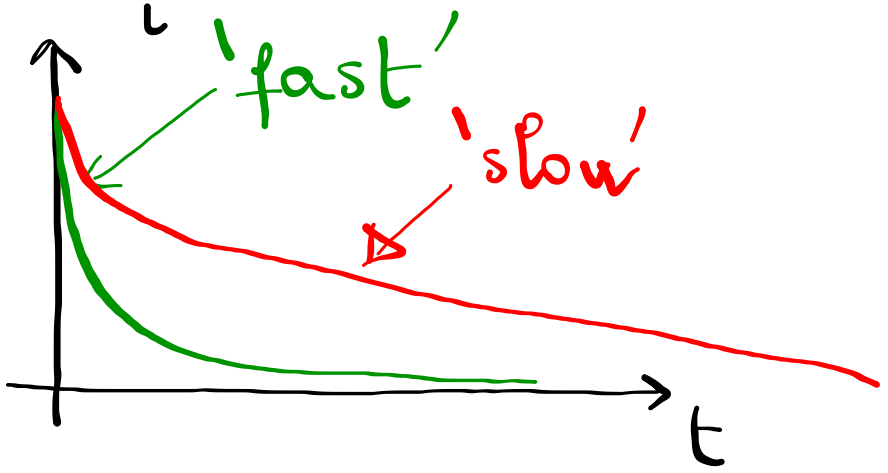


- Situazione con poli che si "separano"
- Separazione in poli dominanti e dominati



- Risposta di un sistema

$$y_i(t) \approx e^{-t/\tau_i}$$

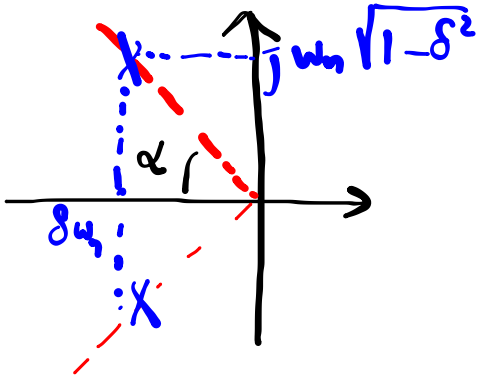


$$y(t) = \sum_{i=1}^{n} y_i(t) =$$

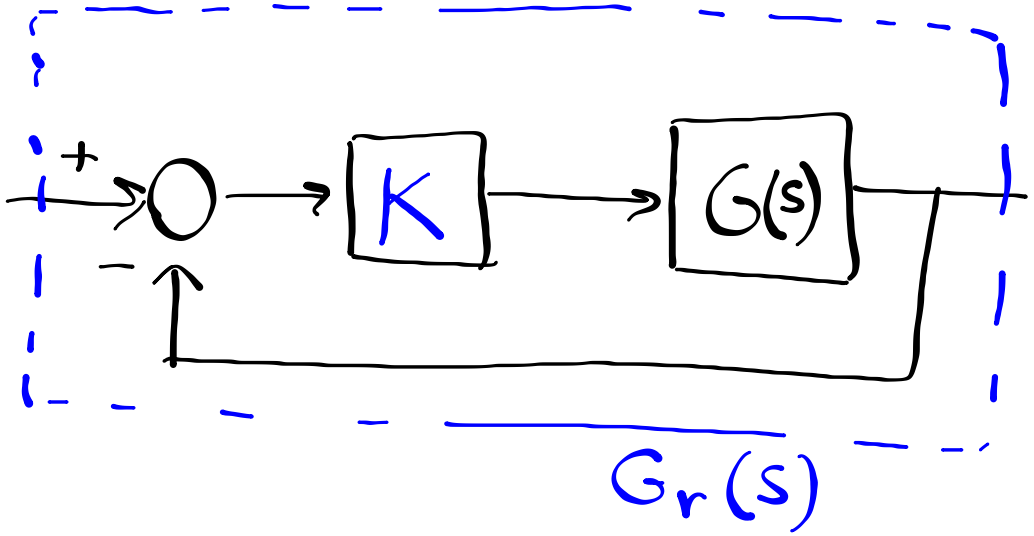
$$= \underbrace{y_s(t)}_{\text{dominante}} + \underbrace{y_f(t)}_{\text{dominato}} \simeq y_s(t)$$

La risposta di un sistema dinamico è determinata dai poli dominanti (quelli più vicini all'asse immaginario)

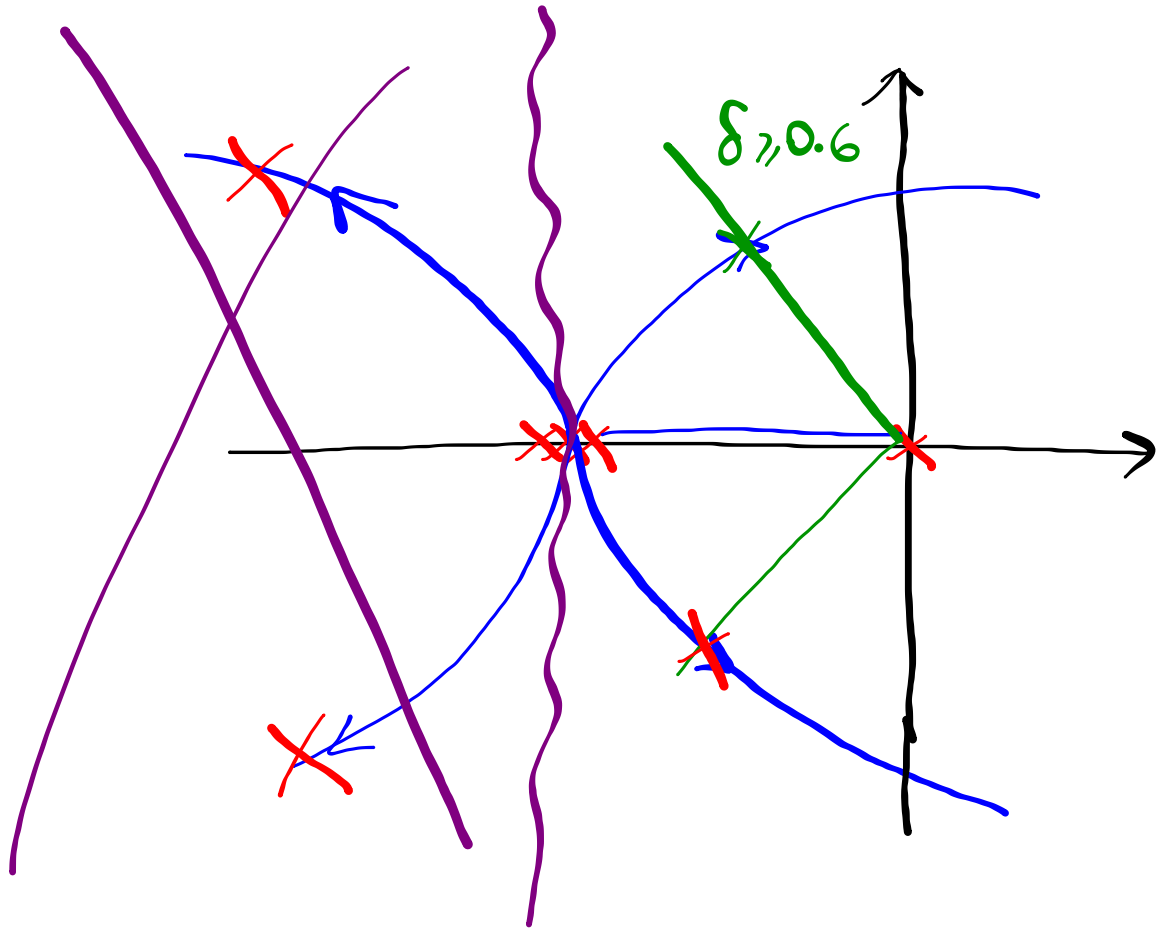
$$G_2(s) = \frac{\omega_n^2}{s^2 + 2\delta\omega_n s + \omega_n^2}$$



$$\begin{cases} S\% = 100\, e^{-\frac{\pi\delta}{\sqrt{1-\delta^2}}} \\ T_a = \frac{3}{\delta\omega_n} \end{cases}$$



Determinare un K (se esiste) tale che $G_r(s) \cong G_2(s)$



$G_r(s) \simeq G_2(s)$

$K\uparrow$	$S\%\uparrow$	$Ta\downarrow$
$K\downarrow$	$S\%\downarrow$	$Ta\uparrow$

Determinare K tale che:

$$\begin{cases} Ta \leq 20\,s. \\ S\% \leq 10 \end{cases}$$

	$K=18.49$	$K=0.20$	
$Ta \leq 20\,s.$	20.50	19.71 s.	OK!
$S\% \leq 10$	7.3%	9.69%	