

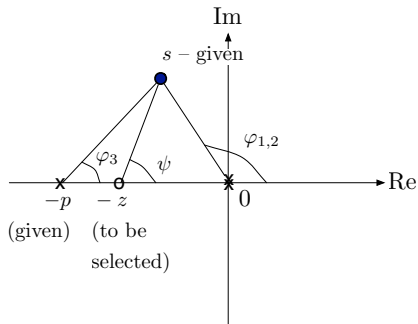
Pole Placement Using RL

Back to our example: double integrator with lead compensation

$$KL(s) = K \frac{s + z}{s + p} \cdot \frac{1}{s^2}$$

Problem: given p and a desired closed-loop pole s , find the value of z that will guarantee this (if possible).

Solution: use the phase condition



Must have

$$\underbrace{\psi}_{\text{angle from } s \text{ to zero}} - \sum_i \underbrace{\varphi_i}_{\text{angles from } s \text{ to poles}} = 180^\circ$$

$$\text{So, we want } \psi = 180^\circ + \sum_i \varphi_i$$