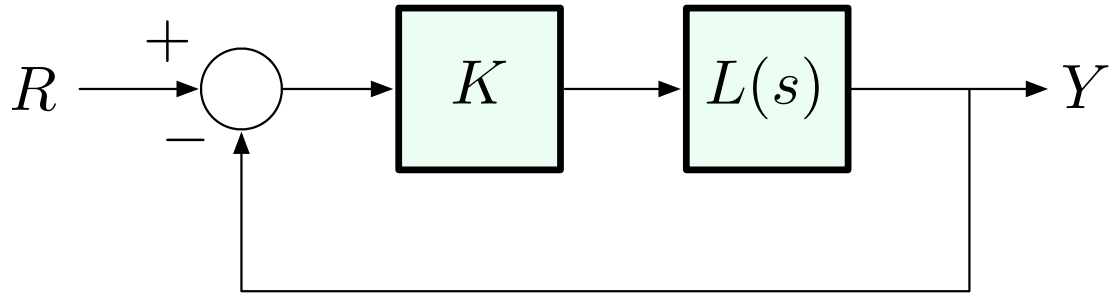
The Root Locus Design Method



Closed-loop transfer function: $\dfrac{Y}{R} = \dfrac{KL(s)}{1+KL(s)}, \; L(s) = \dfrac{b(s)}{a(s)}$

Closed loop poles are solutions of:

$$1 + KL(s) = 0 \quad \Leftrightarrow \quad L(s) = -\frac{1}{K}$$

$$\Updownarrow$$

$$1 + \frac{Kb(s)}{a(s)} = 0$$

$$\Updownarrow$$

$$\underbrace{a(s) + Kb(s)}_{\substack{\text{characteristic} \\ \text{polynomial}}} = 0 \qquad \text{characteristic equation}$$