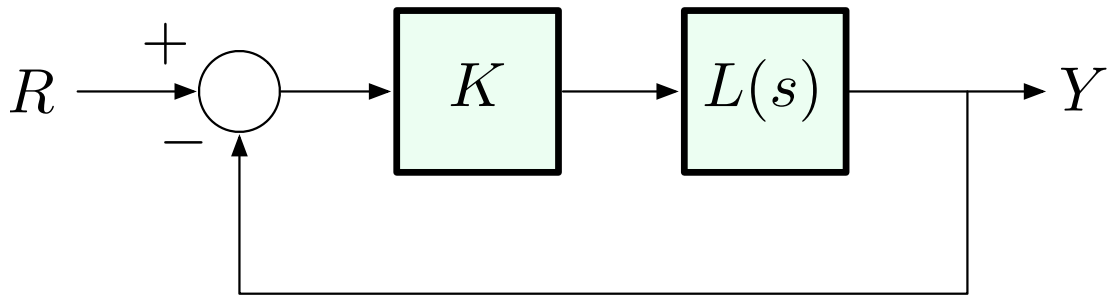
Root Locus and Quantitative Stability



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

For what values of K do we best satisfy given design specs?

Specs are encoded in pole locations, so:

The *root locus* for $1 + KL(s)$ is the set of all closed-loop poles, i.e., the roots of

$$1 + KL(s) = 0,$$

as K varies from 0 to ∞.