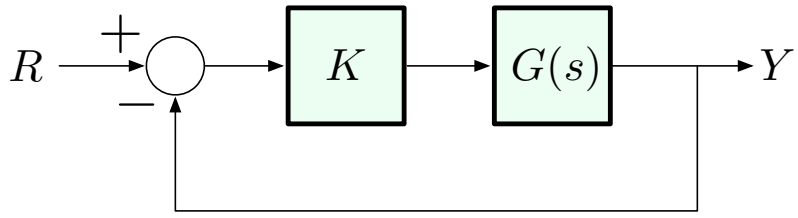
Stability from Frequency Response



Stability from frequency response. If $s = j\omega$ is on the root locus (for some value of K), then

$$|KG(j\omega)| = 1 \qquad \text{and} \qquad \angle KG(j\omega) = 180^\circ \mod 360^\circ$$

Therefore, the transition from stability to instability can be detected in two different ways:

- from root locus — as $j\omega$-crossings
- from Bode plots — as $M = 1$ and $\phi = 180^\circ$ at some frequency ω (for a given value of K)