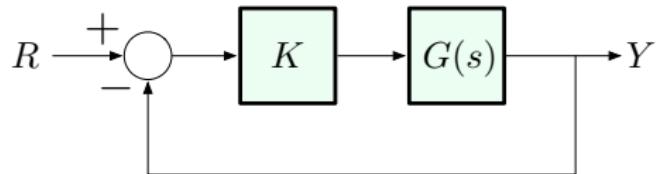


Nyquist Criterion: Z



$$G(s) = \frac{q(s)}{p(s)}, \quad \deg(q) \leq \deg(p)$$

$$1 + KG(s) = \frac{p(s) + Kq(s)}{p(s)}$$

$$\text{closed-loop t.f.} = \frac{KG(s)}{1 + KG(s)} = \frac{Kq(s)}{p(s) + Kq(s)}$$

Therefore:

$$\begin{aligned} Z &= \#(\text{zeros of } 1 + KG(s) \text{ inside } C) \\ &= \#(\text{RHP zeros of } 1 + KG(s)) \\ &= \#(\text{RHP closed-loop poles}) \end{aligned}$$