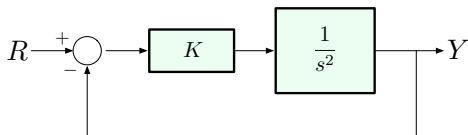


## Double Integrator with P-Gain



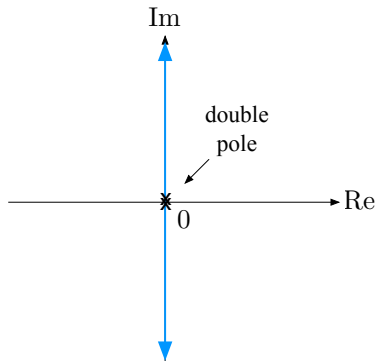
Closed-loop transfer function:

$$\frac{\frac{K}{s^2}}{1 + \frac{K}{s^2}} = \frac{K}{s^2 + K}$$

Characteristic equation:

$$s^2 + K = 0$$

Closed-loop poles:  $s = \pm\sqrt{K}j$



This confirms what we already knew: P-gain alone does not deliver stability.